UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA

DEERPOINT GROUP, INC., **Plaintiff** **v.** **AGRIGENIX, LLC, SEAN MAHONEY, and CUSTOM AG FORMULATORS, INC.,** **Defendants**	**CASE NO. 1:18-CV-0536 AWI BAM** **ORDER REGARDING CLAIMS CONSTRUCTION**

This is a business dispute involving intellectual property and trade secrets between Plaintiff Deerpoint Group, Inc. ("Deerpoint") and Defendants Agrigenix, LLC ("Agrigenix"), Sean Mahoney ("Mahoney"), and Custom Ag Formulators, Inc. ("Custom Ag") (collectively "Defendants"). Currently pending before the Court is a claims construction matter. Deerpoint and Custom Ag have submitted extensive briefing regarding the meaning of 10 terms within Patent No. 9,856,179 filed January 2, 2018 ("the '179 Patent"). Defendants Agrigenix and Mahoney have limited their participation to the joint pre-hearing statement (Doc. No. 129) and have submitted no additional briefing or expert opinions.[1] The parties have agreed on the meaning of three of the terms, but dispute the meaning of the remaining seven. The Court took the matter under submission without holding a hearing. The Court now issues this order which construes the 10 terms at issue in the '179 Patent.

[1] The briefing associated with the claims construction issue is unusual. All parties submitted a joint statement that included agreed terms and disputed terms. The disputed terms had two constructions offered, one by Deerpoint and one by all Defendants. However, when individual trial briefs were submitted, Agrigenix and Mahoney did not submit anything further. On the other hand, Custom Ag submitted their own separate briefing in which they kept one of the previously proposed constructions in the joint statement, but offered amended constructions of the remaining six terms. Custom Ag's briefing was solely on their own behalf, and there was no indication that Agrigenix and Mahoney agreed with any of Custom Ag's amended constructions. Given the state of the claims construction briefing with respect to disputed terms, the Court views the parties as offering (generally) three proposed constructions: one by Deerpoint, one by Custom Ag, and one by Agrigenix and Mahoney.

GENERAL BACKGROUND

Deerpoint owns the '179 Patent. The '179 Patent is entitled "Method and Composition of Agricultural Potassium-Plus Fertigation." Fertigation refers to methods of adding fertilizers to irrigation water for crops.

The "Abstract" of the '179 Patent reads:

> An agricultural potassium-fertigation method for emitter-irrigation potassium-plus fertigation feeds a potassium-plus nutrient feedstock comprised of potassium formate and additional yield-assist constituent(s) and water to an active emitter-irrigation system discontinuously, at levels of 0.15 to 50 gal./min, during one to six nonconsecutive irrigation days.

'179 Patent - Abstract.[2] In the Summary section, the '179 Patent provides in relevant part:

> The present invention provides a method of discontinuous emitter-irrigation potassium-plus fertigation ("discontinuous potassium-plus fertigation") wherein a potassium-plus nutrient feedstock comprised of potassium formate, at least one non-potassium-formate constituent that is beneficial to the crop's nutrient-uptake and/or soil condition ("additional yield-assist constituent"), which preferably is a macro-nutrient, and water is charged to an active emitter-irrigation system to form treated irrigation water, wherein the potassium-plus nutrient feedstock has a high potassium-nutrient content, has a high organic carbon content, has a minimal amount of water, has no or negligible essential yield-extraneous constituent such as sulfate, has no essential yield-adverse constituent such as degradable thiosulfate, phosphate when fed under phosphate-precipitation conditions or chloride and has no constituent that could aggravate the plugging potential of treated irrigation water.

Id. at (Summary) col. 3 ll. 21-38; see also '179 Patent col. 4 ll.6-27. The '179 Patent has 20 claims. See id. Two of these claims are alleged to have been infringed, Claims 14 and 16.

Claim 14 reads:

> A treated irrigation water comprising a potassium-plus nutrient feedstock and irrigation water, wherein said potassium-plus nutrient feedstock is comprised of from 10 to 50 wt. percent potassium formate and from 1 to 35 wt. percent additional yield-assist constituent(s).

Id. at col. 12 ll. 27-31.

Claim 16 reads:

> The treated irrigation water according to claim 14 wherein from 90 to 100 weight percent of said additional yield-assist constituent(s) are selected from the group consisting of N (as N), P (as P2O5), acid and combinations thereof.

Id. at col. 12 ll. 37-41.

[2] The '179 Patent is Exhibit A to Custom Ag's opening brief and Exhibit 1 to Deerpoint's opening briefing.

In the fertilizer industry, fertilizers are classified by their "NPK" numbers – N is the amount of nitrogen expressed in terms of nitrogen, P is the amount of phosphorous expressed in terms of P205 (phosphorous pentoxide), and K is the amount of potassium expressed in terms of K2O (potassium oxide). Nitrogen, phosphorous, and potassium are the three primary plant nutrients and may be provided through many different source compounds. See Krauter 2d Dec. ¶ 12. Because the sources of these three primary nutrients can vary widely, the nutrients are expressed in a uniform manner by reference to the equivalent amounts of potassium in K2O and phosphorus in P205. See id. & ¶ 14. To determine the actual amount of the nutrients, one multiplies the listed amount of phosphorus by 0.44 (the molecular weight of phosphorus in P2O5) and the listed amount of potassium by 0.83 (the molecular weight of potassium in K2O). See Maitra 1st Dec. ¶ 44. While expressing the total amount of nitrogen, phosphorous, and potassium through the N-P-K convention, fertilizer labels also identify other nutrients and include a derivation section that identifies the actual source compound/substance of nitrogen, phosphorous, potassium, and other nutrients. See Kleinman 1st Dec. Exs. 5,7; see also Krauter 2d Dec. ¶ 17. The '179 Patent contains seven examples of potassium-plus nutrient feedstocks and includes NPK values for the seven exemplars. See Table 1 of the '179 Patent.

CLAIMS CONSTRUCTION FRAMEWORK

Claim construction is a matter of law. UCB, Inc. v. Yeda Research & Dev. Co., 837 F.3d 1256, 1259 (Fed. Cir. 2016). "Claim construction seeks to ascribe the meaning to a claim term as understood by a person of ordinary skill in the art at the time of invention." Iridescent Networks, Inc. v. AT&T Mobility, LLC, 933 F.3d 1345, 1350 (9th Cir. 2019).

In construing claims, courts look first to, and primarily rely on, the intrinsic evidence, which includes the claims themselves, the specification, and the prosecution history of the patent. Personalized Media Communs., LLC v. Apple, Inc., 952 F.3d 1336, 1340 (9th Cir. 2020). First, claim construction begins with words of the claims themselves. Endo Pharms., Inc. v. Actavis LLC, 922 F.3d 1365, 1370 (Fed. Cir. 2019). The starting point is how a person of ordinary skill in the art ("POSITA") would understand a claim term at the time of patent application because

inventors are typically skilled in the field of invention and patents are addressed to and intended to be read by others of skill in the pertinent art. Phillips v. AWH Corp., 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). A person of ordinary skill in the art reads a claim term in the context of not only the particular claim in which it appears, but also in the context of the entire patent, including the specification. Allergan Sales, LLC v. Sandoz, Inc., 935 F.3d 1370, 1373 (Fed. Cir. 2019). Claim terms are to be construed consistently throughout a patent. Phil-Insul Corp. v. Airlite Plastics Co., 854 F.3d 1344, 1359 (Fed. Cir. 2017). Second, the "specification" includes both the written description and the claims of the patent. Cisco Sys., Inc. v. TQ Delta, LLC, 928 F.3d 1359, 1362 (Fed. Cir. 2019). Because a patent is a fully integrated instrument that consists principally of a specification that concludes with the claims, the claims must be read in view of the specification. Continental Circuits LLC v. Intel Corp., 915 F.3d 788, 796 (Fed. Cir. 2019). Thus, the specification "is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term." Phillips, 415 F.3d at 1315. When the specification explains and defines a term without ambiguity or incompleteness, "there is no need to search further for the meaning of the term." Sinorgchem Co. v. ITC, 511 F.3d 1132, 1138 (Fed. Cir. 2007). However, courts do not read limitations from the specification, including embodiments, into a claim. See Bradium Techs. LLC v. Iancu, 923 F.3d 1032, 1049 (Fed. Cir. 2019); Mastermine Software, Inc. v. Microsoft Corp., 874 F.3d 1307, 1310 (Fed. Cir. 2017). Sometimes there is a fine line between reading a claim in light of the written description/specification and reading a limitation into the claim from the written description/specification. Howmedica Osteonics Corp. v. Zimmer, Inc., 822 F.3d 1312, 1221 (Fed. Cir. 2016). "Specifications teach. Claims claim." SuperGuide Corp. v. DirecTV Enters., 358 F.3d 870, 875 (Fed. Cir. 2004) (quoting SRI Int'l v. Matsushita Elect. Corp. of Am., 775 F.2d 1107, 1127 n.14 (Fed. Cir. 1985)). Third, the prosecution history is the "entire record of the proceedings in the Patent Office from the first application papers to the issued patent." E.I. du Pont de Nemours & Co. v. Unifrax I LLC, 921 F.3d 1060, 1068 (Fed. Cir. 2019). "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of

prosecution, making the claim scope narrower than it would otherwise be." Phillips, 415 F.3d at 1317. For example, through prosecution history, a patentee may define a claim term or disavow a meaning or scope to which he would otherwise have an exclusive right by virtue of the claim language. Data Engine Techs. LLC v. Google LLC, 10 F.3d 1375, 1382 (Fed. Cir. 2021).

Although "secondary to the intrinsic evidence, courts my rely on extrinsic evidence, which consists of all evidence external to the patent and prosecution history (including expert and inventor testimony, dictionaries, and learned treatises) in construing a claim term. Continental Circuits, 915 F.3d at 799. However, "[i]n most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed. Cir. 1996). "When an analysis of intrinsic evidence resolves any ambiguity in a disputed claim term, it is improper to rely on extrinsic evidence to contradict the meaning so ascertained." Intel Corp. v. VIA Techs., 319 F.3d 1357, 1367 (Fed. Cir. 2003); see Helmsderfer v. Bobrick Washroom Equip., Inc., 527 F.3d 1379, 1382 (Fed. Cir. 2008).

I. AGREED CLAIM CONSTRUCTIONS

The parties have agreed as to the meaning of three claim terms. See Doc. No. 129 at 1:26-2:4. First, the term "from 10 to 50 wt. percent" in Claims 14 and 16 means "where the weight of the subject ingredient is between 10 percent and 50 percent of the weight of the overall mixture, including the ingredient." Id. Second, the parties agree that the term "from 1 to 35 wt. percent" in claims 14 and 16 means "where the weight of the subject ingredient is between 1 percent and 35 percent of the weight of the overall mixture, including the ingredient." Id. Third, the term "from 90 to 100 weight percent" in Claim 16 means ""where the weight of the subject ingredient is between 90 percent and 100 percent of the weight of the overall mixture, including the ingredient." Id. The Court adopts the parties' joint construction of these three claim terms.

II. DISPUTED CLAIM CONSTRUCTIONS

As discussed above, the parties dispute seven terms between Claims 14 and 16. The Court will assess each term separately.

1. "Treated Irrigation Water" (Claims 14 and 16)

Plaintiff's Arguments

Deerpoint argues that "treated irrigation water" is part of the preamble to Claims 14 and 16. Preambles limit an invention if it recites essential structure or steps or if it is necessary to give life, meaning, and vitality to the claim; preambles are not limiting where there is a structurally complete invention in the claim body and the preamble only states a purpose or intended use for the invention. Here, the body of Claims 14 and 16 are structurally complete on their own and contain no references to "treated irrigation water." The term "treated irrigation water" is not needed to give life, meaning, or vitality to Claims 14 or 16. Because the "treated irrigation water" preamble is merely descriptive, it has no bearing on infringement and needs no construction. Alternatively, if the Court finds that "treated irrigation water" is limiting, no construction is needed because its scope and meaning can be fully understood by a POSITA.

Defendant's Arguments

Custom Ag argues that the preamble "treated irrigation water" is limiting in view of other claims in the '179 Patent. Claim 1 discusses "treated irrigation water" and Claims 9, 10, 12, and 13 are dependent on, and thus limited by, Claim 1. Claim 1 indicates that "treated irrigation water" is created from and thus, understood to mean flowing irrigation water in an irrigation system that has had a potassium-plus nutrient feedstock added to it. Further, the specification describes fertigation wherein the potassium-plus nutrient feedstock is charged to an active emitter irrigation system to form treated irrigation water. The specification in several places refers to converting irrigation water to treated irrigation water or treated irrigation water being formed by the described method. Given the language of the specification and other claims, there is a limit on the invention claimed. A POSITA would understand that "treated irrigation water" in Claim 14 means "flowing irrigation water in an irrigation system that has had a potassium-plus nutrient feedstock added to it."

Proposed Constructions

a. Plaintiff's Proposed Construction

Deerpoint contends that the preamble is not limiting and no construction is needed.

b. Defendants' Proposed Construction

Agrigenix and Mahoney propose the following construction: "irrigation water that has had a potassium-plus nutrient feedstock added to it."

Custom Ag proposes the following construction: "flowing irrigation water in an irrigation system that has had a potassium-plus nutrient feedstock added to it."

Discussion

Whether a preamble is limiting is an issue of claim construction. Data Engine, 10 F.4t h at 1380; see Bell Communs. Research, Inc. v. Vitalink Communs. Corp., 55 F.3d 615, 620 (Fed. Cir. 1995). In general, preambles may limit an invention if they recite essential structure or steps, or are necessary to give life, meaning, and vitality to a claim. Arctic Cat, Inc. v. GEP Power Prods., 919 F.3d 1320, 1327 (Fed. Cir. 2019). Conversely, preambles are generally not limiting where the patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. Shoes by Firebug LLC v. Stride Rite Children's Grp., LLC, 962 F.3d 1362, 1367 (Fed. Cir. 2020). Nevertheless, there is no litmus test for determining whether a preamble is limiting. Eli Lilly & Co. v. Teva Pharms. Int'l GmbH, 8 F.4th 1331, 1340 (Fed. Cir. 2021). Ultimately, whether to treat a preamble as limiting is determined based on the facts of each case and in light of the claim as a whole, the invention as described in the specification, and any illumination from the prosecution history. Arctic Cat, 919 F.3d at 1327; see Eli Lilly, 8 F.4th at 1340. "[A] claim preamble has the import that the claim as a whole suggests for it," and when the patentee "chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects." Bell Communs., 55 F.3d at 620.

After applying the above principles, the Court agrees with the construction proposed by Agrigenix and Mahoney. The term "treated irrigation water" means "irrigation water that has had a potassium-plus nutrient feedstock added to it."

This definition is consistent with the express language of Claim 14 and independent Claims 1 and 17, which both use the term "treated irrigation water." As stated above, Claim 14 reads:

> A treated irrigation water comprising a potassium-plus nutrient feedstock and irrigation water, wherein said potassium-plus nutrient feedstock is comprised of from 10 to 50 wt. percent potassium formate and from 1 to 35 wt. percent additional yield-assist constituent(s).

'179 Patent at Claim 14. Claim 17 is extremely similar to Claim 14. Claim 17 reads:

> A treated irrigation water comprising a potassium-plus nutrient feedstock and irrigation water, wherein said potassium-plus nutrient feedstock is comprised of from 10 to 50 wt. percent potassium formate and from 1 to 35 wt. percent additional yield-assist constituent(s) comprised of irrigation water, from 100 to 10,000 ppm potassium as K2O and from 100 to 7,500 ppm additional yield-assist constituent(s).

'179 Patent at Claim 17. Finally, Claim 1 reads:

> A method of discontinuous emitter-irrigation potassium-plus fertigation of an agricultural field, said agricultural field being irrigated by means of an active emitter-irrigation system having a steam of flowing irrigation water upstream of said agricultural field, said method comprising the steps of:
>
> (step 1) converting said irrigation water to treated irrigation water by charging a potassium-plus nutrient feedstock to said stream of said flowing irrigation water upstream of said agricultural field whereby said irrigation water is converted to treated irrigation water, wherein said potassium-plus nutrient feedstock is comprised of from 10 to 50 wt. percent potassium formate, from 1 to 35 wt. percent additional yield-assist constituent(s) and water;
>
> (step 2) irrigating said agricultural field with said treated irrigation water; and
>
> (step 3) repeating step 1 and step 2 on 0 to 5 nonconsecutive irrigation days over a crop cycle.

'179 Patent at Claim 1.[3]

Claims 14 and 17 explain the composition of "treated irrigation water" as being comprised of irrigation water and a potassium-nutrient feedstock. That is, Claims 14 and 17 identify the contents of the fertigation output, i.e. the treated irrigation water. Claim 1 explains how irrigation water is converted to "treated irrigation water" in active fertigation. While Claim 1 is intended to explain how to fertigate, it nonetheless describes the process of converting irrigation water to treated irrigation water and that process involves only the combination of irrigation water and a potassium-plus nutrient feedstock. The process of converting irrigation water into "treated

[3] The Court notes that Deerpoint's reply brief argues that it is improper to consider unasserted method Claim 1 in evaluating asserted composition Claim 14. The Court disagrees. Both claims use the term "treated irrigation water." A term should be construed consistently among a patent's claims, Phil-Insul Corp., 854 F.3d at 1359, and preambles are construed in light of the entire patent. Eli Lilly, 8 F.4th at 1340. Further, in the prosecution history, Deerpoint explained that it had amended Claim 14 to express amounts in terms of weight percentage in accordance with Claim 1. See Doc. No. 132-2 at ECF p.46. Thus, Deerpoint itself recognized when dealing with the Patent Office that Claim 1 and Claim 14 are related. Accordingly, it is entirely appropriate to consider Claim 1.

irrigation water" is consistent with the composition of "treated irrigation water" as described in Claim 14. Therefore, the composition of "treated irrigation water" as found in Claims 14 and 17, as well as the process for converting irrigation water into "treated irrigation water," make it clear that "treated irrigation water" is simply irrigation water that has had a potassium-plus nutrient feedstock added to it. Accordingly, the Court agrees with the construction proposed by Agrigenix and Mahoney.

The Court does not agree with Custom Ag that it is necessary to limit the definition of "treated irrigation water" to include the concept of flowing irrigation water. Custom Ag and its expert rely on Claim 1 to argue that "treated irrigation water" must including flowing water. As quoted above, Claim 1 describes a method for active fertigation. Fertigation, as the Patent's "Background of the Invention" section recognizes, refers to adding fertilizers to water that is being used to irrigate crops. See '179 Patent at col. 1 ll. 34-36. That is, fertigation under the '179 Patent is an active process involving flowing water. In contrast, Claim 14 does not involve a method for active fertigation. Instead, Claim 14 identifies the composition of the fertigation output, i.e. the "treated irrigation water." Identifying the process of creating treated irrigation water is not the same as identifying what treated irrigation water actually is. The Court does not find that it is appropriate to read part of the process of making "treating irrigation water" into the definition of what "treated irrigation water" is – irrigation water that has had a potassium-plus nutrient feedstock added to it.

The Court also disagrees with Deerpoint that no construction is needed. The term "treated irrigation water" to a POSITA who is knowledgeable in chemistry and soil and water sciences would likely mean that a problem with the irrigation water has been corrected chemically.[4] See Krauter 1st Dec. at ¶ 23. However, from the entirety of the '179 Patent's language, including the language of Claim 14 itself, it is clear that the '179 Patent is not using "treated irrigation water" to mean a problem with irrigation water that has been chemically corrected. Instead, the language of Claims 14 and 16 and the '179 Patent as a whole show that "treated irrigation water" is merely

[4] The Court notes that Deerpoint's expert chemist does not opine that "treated irrigation water" has a commonly accepted meaning. See Maitra 2d Dec. ¶ 10.

irrigation water that has had particular fertilizers added to it for the purposes of fertigation. Cf. id. at ¶¶ 26-27. Therefore, a POSITA would understand the term "treated irrigation water" as used in Claim 14 and dependent Claim 16 at a minimum to refer to irrigation water that has had a potassium-plus nutrient feeds stock added to it. Cf. id.

Finally, the Court recognizes that Deerpoint's expert chemist Dr. Maitra has stated that Claim 14 when read without the "treated irrigation water" preamble describes a structurally complete chemical composition. See Maitra 2d Dec. ¶ 10. Generally, preambles do not limit structurally complete inventions. See Shoes by Firebug, 962 F.3d at 1367. However, this is a general rule. See id. There is no litmus test for determining whether a preamble is limiting. See Eli Lilly, 8 F.4th at 1340; Shoes by Firebug, 962 F.3d at 1367; Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1257 (Fed. Cir. 1989). Therefore, that a structurally complete chemical composition may be identified without the preamble does not *per se* mean that the preamble is not limiting. See id. Here, the Court does not read Claim 14 as one that is a truly independent and a stand-alone chemical composition. The '179 Patent as a whole is a for a system of fertigation, which includes a method of fertigating and the composition of fertigation outputs (irrigation water and fertilizer). Claim 14 identifies a fertigation output that is referred to as "treated irrigation water" and has a particular composition. In order to give the invention of Claim 14 vitality and appropriate meaning as a fertigation output within the fertigation system described in the '179 Patent, cf. Arctic Cat, 919 F.3d at 1327 (holding that preambles are evaluated in light of the entirety of a patent), it is necessary to define the term "treated irrigation water."

2. "Potassium-Plus Nutrient Feedstock" (Claim 14)

Plaintiff's Arguments

Deerpoint argues that the term is partially defined by Claim 14 itself by requiring that the mixture contain 10 to 50 wt. percent potassium formate and 1 to 35 wt. percent additional yield-assist constituents. The Abstract of the '179 Patent describes a "potassium-plus nutrient feedstock comprised of potassium formate and additional yield-assist constituent(s) and water." The Summary of the '179 patent describes the mixture as being "comprised of potassium formate, at least one non-potassium formate constituent that is beneficial to the crop's nutrient uptake and/or

soil condition. ('additional yield-assist constituent'), which preferably is a macro-nutrient, and water." The specification also discloses other sources of potassium and compares them unfavorably to potassium formate. However, while the patent does require that potassium formate be used, it does not require that it be used as the exclusive source of potassium. A person of ordinary skill in the art would know that there are numerous other sources of potassium.

Deerpoint contends that any attempt by Defendants to limit the source of potassium to potassium formate is improper. While at least one ingredient in the feedstock must be a non-potassium formate constituent, nothing in the patent excludes the possibility that the additional yield-assist constituent contain potassium in another form. The patent simply does not limit the source of all potassium in the potassium-plus nutrient feedstock to potassium solely from potassium formate.

Deerpoint also contends that the prosecution history does not demonstrate any disavowal. In order for disavowal to be found, there must have been a clear and unequivocal representation that potassium formate, and no other source of potassium, could be present in the claimed invention. Deerpoint acknowledges that the patent examiner in a July 2016 Non-Final Rejection letter stated that claim 14 was not sufficiently enabled by identifying "potassium as K20" because "it is clear from the specification that the potassium is required to be added as potassium formate." However, no rationale was provided by the examiner and no sections of the disclosures were cited in support of the initial rejection. Further, "potassium as K2O" is a term of art referring to a metric for the amount of potassium, not to the presence of actual K2O. The specification discloses that preferred embodiments of the potassium-plus nutrient feedstock contain potassium, as measured in K2O equivalents, at the level recited in the claims. Moreover, Deerpoint's response to the examiner did not disavow any scope. Deerpoint's response made clear that the amended version (which is now Claim 14) recited the same amount of potassium as the original version, but merely expressed the amount in a different way. Deerpoint did not agree with the observations of the of examiner, rather it asserted that no change in scope would result from the amendment. The prosecution history simply cannot support a finding that Deerpoint disavowed any aspect of Claims 14 and 16.

Defendant's Arguments

Defendants argue that "potassium-plus nutrient feedstock" has no particular meaning to a POSITA. Nevertheless, all the Claims in the '179 Patent recite potassium formate as the only potassium-based constituent, and all seven examples in the Specification identify potassium only from potassium formate. All other identified additional yield-assist constituents are non-potassium-containing ingredients. Moreover, the specification clearly disclaims sources of potassium other than potassium formate as not suitable for the potassium-plus nutrient feedstock of the '179 Patent. To interpret Claims 14 and 16 as accepting non-potassium formate sources of potassium would put the claims in violation of the requirement of 35 U.S.C. § 112 that the "specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any [POSITA] to which it pertains, or with which it is most nearly connected, to make and use the same." Finally, the file history in this case demonstrates that the potassium in the potassium-plus nutrient feedstock must be added as potassium formate. Claim 14 originally described the potassium-plus nutrient feedstock as being comprised of "50 to 20,000 ppm potassium as K2O . . . ." The patent examiner rejected Claim 14 because the disclosure was not commensurate in scope with the recitation of "potassium as K2O" in that the specification required the potassium be added as potassium formate. Deerpoint responded by amending Claim 14 to recite that the potassium-plus nutrient feedstock is comprised of 10 to 50 wt. percent potassium formate . . . ." Under conventional fertilizer label practice, "potassium as K2O" means the fertilizer contains as much potassium in any form, as it would be if it were K2O. Thus, utilization of potassium in any form was rejected and disclaimed. Moreover, the measures of potassium in the original submission and the amended submission are different. The range in the original submission, 50 to 20,000 ppm, is a 400 times increase from the minimum to the maximum range, while the amended submission, 10 to 50 wt. percent, is only a five times increase from the minimum to the maximum range. Thus, pursuant to the doctrine of prosecution estoppel, Deerpoint conceded that the invention as patented is not as broad as the original claim and that the potassium in the feedstock comes solely from potassium formate.

Proposed Constructions

a. Plaintiff's Proposed Construction

Deerpoint contends that no construction is needed and that the trier of fact can fully understand the scope and meaning of the term as understood by a POSITA. Alternatively, Deerpoint proposes: "an aqueous fertilizer mixture comprised of potassium formate and at least one additional yield-assist constituent."

b. Defendants' Proposed Construction

All Defendants propose: "A liquid fertilizer mixture containing potassium provided solely from potassium formate, in combination with one or more other non-potassium nutrient constituents."

Discussion

The Court does not agree that the term "potassium-plus nutrient feedstock" does not require a definition. This term would be unknown to a POSITA with relevant expertise in the fields of chemistry and soil and water sciences. See Krauter 1st Dec. ¶ 28. A POSITA would understand the term "potassium-plus nutrient feedstock" through the claims, specification, and file history of the '179 Patent. See id. Also, the parties have both agreed that a definition of "potassium-plus nutrient feedstock" should include some indication that the feedstock is an aqueous or liquid solution. The Court finds the parties' agreement to be significant because, while Claim 14 clearly indicates that the feedstock is added to irrigation water, Claim 14 itself does not clearly state that the feedstock is itself a liquid. Given these considerations, the Court concludes that it is necessary to construe the term "potassium-plus nutrient feedstock."

The parties agree in general that the potassium-plus nutrient feedstock of Claim 14 is an aqueous fertilizer mixture that is made of potassium formate and one additional yield-assist constituent/nutrient constituent. The dispute between the parties regarding this term is whether the total amount of potassium in the potassium-nutrient feedstock must be derived solely from potassium formate.

a. Claim Language

The language of Claim 14 indicates that the potassium-plus nutrient feedstock is made of a

weight percentage range of potassium formate and a weight percentage range of an additional yield-assist constituent. Potassium formate is a specific substance and ingredient. Thus, the first ingredient of the potassium-plus nutrient feedstock is expressly limited to only potassium formate. However, there is nothing about identifying that particular ingredient that in and of itself means that potassium formate must be the only potassium containing ingredient in the feedstock as a whole. Similarly, there is no limit on what the additional yield-assist constituent is or can be (other than it being a beneficial plant nutrient) as long as it is not potassium formate. Thus, the plain language of Claim 14, along with the parties' agreement regarding the physical form of the feedstock, indicates that a potassium-plus nutrient feedstock is an aqueous fertilizer mixture comprised of potassium formate and at least one additional yield-assist constituent. This construction would not prohibit the additional constituent/nutrient from containing potassium.

b. Prosecution History[5]

Defendants contend that Deerpoint's amendment of Claim 14 and the doctrine of prosecution history estoppel preclude Deerpoint from arguing that Claim 14 does not require that all potassium in the potassium-plus feedstock be derived solely from potassium formate.

Under the doctrine of prosecution history estoppel, a "patentee's decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 740 (2002); Pharma Tech Sols., Inc. v. LifeScan, Inc., 942 F.3d 1372, 1380 (Fed. Cir. 2019). However, "[p]rosecution history estoppel applies as part of an infringement analysis to prevent a patentee from using the doctrine of equivalents to recapture subject matter surrendered from the literal scope of a claim during prosecution." Trading Techs. Int'l, Inc. v. Open E Cry, LLC, 728 F.3d 1309, 1322 (Fed. Cir. 2013). Prosecution history does not apply to claims construction. See id.; Styku, LLC v. Fit3D, Inc., 2018 U.S. Dist. LEXIS 206444, *16 (C.D. Cal. Dec. 4, 2018); Home Gambling Network, Inc. v. Piche, 2013 U.S. Dist. LEXIS 141595,

[5] The application for the '179 Patent was submitted by John and Deborah Miller, who are officers/principals of Deerpoint. At times, the briefing regarding prosecution history discusses the actions of the Millers. Because the Court detects no relevant distinction between the Millers and Deerpoint for purposes of this motion, the Court will simply refer to "Deerpoint."

*24-*25 (D. Nev. Sept. 30, 2013); CIVIX-DDI, LLC v. Microsoft Corp., 84 F.Supp.2d 1132, 1139 (D. Col. 2000). Therefore, the Court concludes that prosecution estoppel does not apply at this stage of the proceedings. See id.

Nevertheless, the doctrine of prosecution disclaimer does apply to claims construction. See Trading Techs., 728 F.3d at 1322. Prosecution disclaimer "precludes patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution." Traxcell Techs., LLC v. Nokia Sols. & Network Oy, 15 F.4th 1136, 1141 (Fed. Cir. 2021); Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1323 (Fed. Cir. 2003). Prosecution disclaimer "applies where an applicant's action during prosecution prospectively narrows the literal scope of an otherwise expansive claim term." Trading Techs., 728 F.3d at 1322. The doctrine ensures that claims are not construed one way in order obtain their allowance from the USPTO and in a different way against accused infringers. Traxcell Techs., 15 F.4th at 1141; Omega Eng'g, 334 F.3d at 1380. Prosecution disclaimer can arise from both claim amendment and arguments. Traxcell Techs., 15 F.4th at 1141; Tech. Props. Ltd. LLC v. Huawei Techs. Co., 849 F.3d 1349, 1357 (Fed. Cir. 2017). However, prosecution disclaimer applies only if the patentee has unequivocally disavowed a certain meaning to obtain a patent in a way that is clear and unmistakable to a person of ordinary skill in the art. See Traxcell Techs., 15 F.4th at 1141; Tech. Props., 849 F.3d at 1357. If the challenged actions are "ambiguous or amenable to multiple reasonable interpretations, prosecution disclaimer is not established." Tech. Props., 849 F.3d at 1358. The party asserting prosecution disclaimer has the burden of demonstrating the existence of a "clear and unmistakable" disclaimer that would have been evident to one skilled in the art. Massachusetts Inst. of Tech. v. Shire Pharm., Inc., 839 F.3d 1111, 1122 (Fed. Cir. 2016); Elbex Video, Ltd. v. Sensormatic Elecs. Corp., 508 F.3d 1366, 1371-72 (Fed. Cir. 2007). Even if the "prosecution history statements do not rise to the level of unmistakable disavowal, they do inform the claim construction." Shire Dev., LLC v. Watson Pharms., Inc., 787 F.3d 1359, 1366 (Fed. Cir. 2015). For example, an applicant's amendment accompanied by explanatory remarks can define a claim term by demonstrating what the applicant meant by the amendment. Personalized Media Communs., LLC v. Apple Inc., 952 F.3d 1336, 1340 (Fed. Cir. 2020).

The basis for disavowal or disclaimer is an amendment that was made to Claim 14. "[A]n amendment that clearly narrows the scope of a claim, such as by the addition of a new claim limitation, constitutes a disclaimer of any claim interpretation that would effectively eliminate the limitation or that would otherwise recapture the claim's original scope." Schindler Elevator Corp. v. Otis Elevator Co., 593 F.3d 1275, 1285 (Fed. Cir. 2010). Claim 14 was changed in response to a non-final rejection by the United State Patent & Trademark Office ("USPTO"). Claim 14 was rejected by the USPTO on the basis of 35 U.S.C. § 112(a). Claim 14 initially read: "A treated irrigation water comprising potassium-plus nutrient feedstock comprised of irrigation water, from 50 to 20,000 ppm potassium as K2O and from 50 to 15,000 ppm additional yield-assist constituents." Doc. No. 132-2 at ECF p.23. The USPTO stated, "The 'enabling' disclosure is not commensurate in scope with recitation of 'potassium as K2O,' since it is clear from the specification that the potassium is required to be added as potassium formate." Id. at ECF p.32. Deerpoint responded by submitting Claim 14 as it now currently reads: "A treated irrigation water comprising a potassium-plus nutrient feedstock and irrigation water, wherein said potassium-plus nutrient feedstock is comprised of from 10 to 50 wt. percent potassium formate and from 1 to 35 wt. percent additional yield-assist constituent(s)." As part of the amendment process, Deerpoint responded to the USPTO in relevant part:

> Claims 14-20, *all of which express the amount of potassium formate as "potassium as K2O,"* have been rejected under [29 U.S.C. §] 112. Claims 14 and 17, the independent claims within this group, have each separately been amended to express the potassium-plus nutrient feedstock constituents in terms of weight percent, following the parameters recited in claim 1, and deleting recitations that are redundant and/or are expressed in other parameters.

Id. at ECF p.46 (emphasis added).

Defendants contend that by amending Claim 14 to reference potassium formate instead of potassium as K2O, Deerpoint lost the benefit of using potassium derived from any source, not just potassium formate, as part of the potassium-plus nutrient feedstock. In contrast, Deerpoint contends that its response to the patent examiner made clear that the amended version recited the same amount of potassium as the original version, but merely expressed the amount in a different way. That is, the amended claim presented the potassium in units of potassium formate instead of

units of K2O. Deerpoint further contends that original Claim 14 recited the amount of potassium in the claimed composition of irrigation water, while amended/current Claim 14 recites the amount of potassium formate in the feedstock, which is a constituent part of the treated irrigation water. Deerpoint argues that neither their amendment nor their remarks literally limit the source of potassium to potassium formate.

The Court is not satisfied with either side's interpretation of the prosecution history.

The Court disagrees with two central premises of Deerpoint's interpretation. First, the Court does not agree that the potassium reference in original Claim 14 was limited to describing irrigation water while the potassium reference in amended Claim 14 is limited to describing the feedstock. As stated above, original Claim 14 read: "A treated irrigation water comprising potassium-plus nutrient feedstock comprised of irrigation water, from 50 to 20,000 ppm potassium as K2O and from 50 to 15,000 ppm additional yield-assist constituents." Original Claim 14 uses the word "comprising" twice. As relevant here, the second use of "comprising" follows the term "potassium-nutrient feedstock." The words following the second use of "comprising" are irrigation water, potassium, and additional yield-assist constituent. That is, there are three substances listed after the second use of "comprising," meaning that original Claim 14 was attempting to identify three ingredients of the feedstock. The word "comprising" does not follow the term "irrigation water." If "potassium as K2O" were truly intended to be a component of "irrigation water," then one would expect Deerpoint to use the word "comprising" *after* "irrigation water," not *before* it. To accept Deerpoint's argument that original Claim 14 described the contents of "irrigation water" as being comprised of "potassium as K2O" and an additional yield assist constituent would give a new definition and understanding to the term "irrigation water" and would leave the term "potassium-plus nutrient feedstock" insufficiently described/defined. It also makes little sense for "potassium as K2O" to be used in the definition of "irrigation water" instead of as an ingredient of "potassium-plus nutrient feedstock" since "potassium" is expressly referenced as part of the feedstock. Further, both original and amended Claim 14 identified and described "treated irrigation water." Both amended and original Claim 14 describe a feedstock, some form of potassium, additional yield-assist constituents, and irrigation water. The same

general components of "treated irrigation water" are identified in both original and amended Claim 14. It is apparent to the Court that original Claim 14 is attempting to convey in a less artful manner what amended Claim 14 clearly describes – "treated irrigation water" is irrigation water that has had a potassium-plus nutrient feedstock added to it. The potassium and additional yield-assist constituents are what comprise the feedstock, they are not what comprises the irrigation water. Contrary to Deerpoint's argument, original and amended Claim 14 describe the same thing and their use of the term "potassium" (either as K2O or potassium formate) is understood as an ingredient of the feedstock, not the irrigation water.

Second, Deerpoint's argument that original Claim 14 expressed the total amount of potassium is not persuasive. Deerpoint does not address a key representation that accompanied its amendment. Deerpoint's explanation to the USPTO stated that Claims 14 through 20 had all expressed the amount of *potassium formate*, not the total amount of *potassium*, as "potassium as K2O" in the treated irrigation water. See Doc. No. 132-2 at ECF p.46; cf. Personalized Media, 952 F.3d at 1340. This explanation is directly contrary to Deerpoint's position in this Court. The explanation states that the amendments were made to express amounts in weight percentages (in accordance with Claim 1) and to eliminate any recitations that were redundant or expressed "in other parameters." Changing a reference from "potassium as K2O" to "potassium formate," and changing the amounts from ppm (parts per million) to weight percentages, are changes to the parameters for expressing the amount of potassium formate in the potassium-plus nutrient feedstock. Deerpoint's explanation to the USPTO indicates that Claim 14, be it the original or amended version, has always described or been intended to describe the total amount of *potassium formate*, not the total amount of amount of *potassium*, as the first ingredient of the potassium-plus nutrient feedstock. See Personalized Media, 952 F.3d at 1340.

The Court agrees that the reference to "potassium as K2O" in original Claim 14 was an invocation of the standard N-P-K labeling convention. Utilizing this labeling convention could reasonably be interpreted as identifying the total amount of potassium in the feedstock because the convention identifies total amounts of nitrogen, phosphorous, and sodium regardless of source. However, because all sources of potassium in the N-P-K labeling convention are expressed in

terms of "potassium as K2O" irrespective of the actual derivation, it is not necessarily unreasonable to interpret "potassium as K2O" as one way of quantifying potassium formate. The N-P-K labeling convention simply does not account for amounts of potassium formate apart from a measurement that is in "potassium as K2O." Therefore, the explanation that accompanied the amendment to Claim 14 is not necessarily inconsistent with the N-P-K labeling convention.

With respect to Defendants' arguments, while the Court agrees that the prosecution history demonstrates that potassium formate is a required ingredient of the potassium-plus nutrient feedstock, the Court cannot agree that the prosecution history demonstrates that potassium formate must be the only source of potassium in the potassium-plus nutrient feedstock. Defendants' argument assumes that original Claim 14's reference to "potassium as K2O" was a reference to the total amount of potassium in the feedstock. However, as discussed above, Deerpoint explained to the USPTO that original Claim 14 (as well as claims 15 through 20) all expressed the amount of *potassium formate,* not the total amount of potassium, in the feedstock. This explanation is not necessarily inconsistent with the N-P-K convention because the total amount of potassium formate would be expressed as "potassium as K2O." By replacing "potassium as K2O" with "potassium formate," Deerpoint did not give up a broader reading of the first ingredient because it does not appear that Deerpoint ever asserted to the USPTO that the first ingredient was anything other than potassium formate. Thus, because the first ingredient in the potassium-plus nutrient feedstock is and has always been potassium formate, amended Claim 14 did not narrow the scope of original Claim 14 by replacing "potassium as K2O" with "potassium formate."

The Court concludes that the prosecution history demonstrates that both original and amended Claim 14 identified quantities of potassium formate as the first ingredient of the potassium-plus nutrient feedstock. See Personalized Media, 952 F.3d at 1340. As a result, the prosecution history is not so clear that a POSITA would understand that Deerpoint disavowed the addition of potassium from sources that are in addition to potassium formate as part of the total composition of the potassium-plus nutrient feedstock. Tech. Props., 849 F.3d at 1358.

c. Specification

The specification includes a list of seven examples of potential potassium-plus nutrient

feedstocks. See '179 Patent at col. 4 l. 47 to col. 6 l. 9. Those seven examples are then quantified in Table 1 in terms of N-P-K values in percentage weights. See '179 Patent at Table 1. As Defendants correctly point out, for each of the seven examples provided, the only source of potassium is potassium formate. See id. The '179 Patent does not say that the seven examples represent an exclusive list of embodiments or all possible feedstocks.

The Federal Circuit has held that specifications need only teach one mode of making and using a claimed composition. Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1335 (Fed. Cir. 2003). Moreover, it is not appropriate to incorporate limitations from the specification into a claim. Bradium Techs., 923 F.3d at 1049. The Court is aware of no authority that would require the '179 Patent to disclose all the ways of making the feedstock or all the potential formulations that would fit within the express parameters of Claim 14. Therefore, that all of the seven non-exclusive examples list potassium formate, and do not list any other potassium containing substances, does not mean the potassium formate must be the only potassium containing substance in the potassium-plus nutrient feedstock. Cf. Bradium Techs., 923 F.3d at 1049; Amgen, 314 F.3d at 1335.

d. Conclusion

After considering the parties' arguments in light of the claim language, the specification of the '179 Patent, and the prosecution history, the Court agrees with the construction proposed by Deerpoint. Therefore, the term "potassium-plus nutrient feedstock" means " an aqueous fertilizer mixture comprised of potassium formate and at least one additional yield-assist constituent."

3. "Potassium Formate" (Claim 14)

Plaintiff's Argument

Deerpoint argues that the disagreement among the parties is whether the potassium-plus nutrient feedstock must contain a certain amount of dissolved potassium formate or whether the feedstock must be made by adding molecular/solid potassium formate. The '179 Patent does not require that the feedstock be made with molecular potassium formate. Instead, the specification includes seven examples that all have a liquid potassium formate solution. There is no requirement regarding how the aqueous potassium formate solution is formed. A POSITA would

understand that a potassium formate solution does not contain molecular potassium formate, rather it contains potassium and formate ions. To read in a requirement that the potassium-plus nutrient feedstock contain molecular potassium formate or that potassium formate solution be made with molecular potassium formate would be contrary to the language of the '179 Patent.

Deerpoint also argues that Defendants seek to improperly limit the scope of Claim 14 by limiting how the composition is made. The expert witnesses in this case both agree that a 75% aqueous solution of potassium formate can be made from a variety of reagents, not just molecular potassium formate salt. Further, the only potassium formate that would be present in the liquid solution disclosed in the specification's examples would be fully dissolved and in the form of potassium cations and formate anions. The chemical symbols are represented by the "-" and "+" symbols in the proposed construction.

Finally, Deerpoint replies that a 75% aqueous solution of potassium formate contains no molecular potassium formate salt. As a result, there is no distinction between HCO2K(aq), which is a formulation accepted by Defendants and $(HCO2)^-(aq) + K^+(aq)$, which is not accepted by Defendants. That is, at the relevant concentrations, these two formations describe the same substance. Further, contrary to Defendants' apparent assertion, Deerpoint does not argue that a combination of an additional yield assist constituent with potassium formate, which would contain potassium ions, formate ions, and other components (ions or otherwise), should together be called "potassium formate." Also, Deerpoint contends that Defendants' position would improperly distinguish between chemically identical forms of potassium formate on the unclaimed and undisclosed basis of how they are made or what they are used for. Deerpoint also states that it is not attempting to broaden the scope of its claims. The claims recite that the composition at issue is comprised of *inter alia* potassium plus nutrient feedstock and that the feedstock contains potassium formate. Deerpoint states that it seeks only to ensure that some forms of potassium formate are not arbitrarily excluded.

Defendant's Argument

Custom Ag argues that it accepts various chemical representations for potassium formate, including those with an "(aq)" designation. That is because potassium formate is highly water

absorbent (hygroscopic), may be sold as a liquid, and the examples given in the '179 Patent all begin with a 75 wt. percent liquid solution of potassium formate. However, Custom Ag contends that the chemical representations of potassium formate that have "-" and "+" symbols (which indicate anions and cations, respectively) are too broad because the source of these ions may be something other than potassium formate. Expressing potassium cations and formate anions in this manner means the substance is in solution and exists only as components. The formate and potassium ions will no longer have the same properties and chemical activity as potassium formate and may react with other ions that are almost certain to be found in the solution.

Custom Ag also argues that they are not contending that the feedstock must be made by adding molecular potassium formate. Custom Ag acknowledges that potassium formate may be in an aqueous form. Deerpoint is confusing an ingredient of the liquid fertilizer mixture with a step in the method of making the mixture. Custom Ag also argues that Deerpoint is attempting to expand their claims because potassium ions and formate ions could exist in a solution without potassium formate ever having been used as an ingredient. It is appropriate to refer to ionic components in a solution as the compound they would become as they precipitated or if the objective of the chemical process was the synthesis of that compound. It is not appropriate to refer to the combination of components in one step of a multi-step process as they compound that they could potentially combine to form if the process is ended after such a step, where subsequent steps immediately follow include other ions that combine to form a different product. The simultaneous presence of potassium cations and formate anions in a complex solution with other anions and cations does not justify designating the solution as "potassium formate." Custom Ag argues that its position does not require that potassium formate be made in a particular way, but does require that potassium formate (either in molecular or aqueous form) be used as an ingredient in the potassium plus nutrient feedstock.

Proposed Construction

a. Plaintiff's Proposed Construction

Deerpoint contends that no construction is needed and that the trier of fact can fully understand the scope and meaning of the term as understood by a POSITA. Alternatively,

Deerpoint proposes: "potassium formate (denoted HCO2K, HCOOK, HCO2K(aq), HCOOK(aq), $(HCO2)^- + K^+$, $(HCOO)^- + K^+$, $(HCO2)^-$ (aq) + K^+ (aq)+, $(HCOO)^-$ (aq) + K^+ (aq)."

b. Defendants' Proposed Construction

Agrigenix and Mahoney propose: "potassium formate (CHKO2) added as an ingredient into the liquid fertilizer mixture."

Custom Ag proposes: "potassium formate ($CHKO_2$, HCO_2K, HCOOK, HCO_2K(aq), or HCOOK(aq)), added as an ingredient into the liquid fertilizer mixture."

Discussion

All parties acknowledge through either briefing or proposed constructions that potassium formate is required to be used as an ingredient in the potassium-plus nutrient feedstock. This acknowledgment is appropriate as it comports with the clear and obvious reading of Claim 14, as well as the '179 Patent as a whole. As discussed above, the potassium-plus nutrient feedstock must include a percentage weight of potassium formate. Because of the obvious and clear expression of potassium formate as an ingredient, the Court finds that it is unnecessary, as suggested by Defendants, to expressly define potassium formate in part as "an ingredient" in the potassium-plus nutrient feedstock. Therefore, the question really is, what does the term "potassium formate" mean and/or whether it is necessary to define what "potassium formate" is?

Custom Ag and Deerpoint agree on a number of points regarding potassium formate. To wit, potassium formate is a chemical substance and that one molecule of potassium formate is composed of one hydrogen atom, one carbon atom, two oxygen atoms, and one potassium atom; potassium formate in "molecular form" is a solid salt; potassium formate can also exist in an aqueous or water solution and, assuming appropriate ratios of potassium formate and water, aqueous potassium formate will fully dissolve and exists as potassium cations and formate anions in the water; and potassium formate can be synthesized utilizing other substances.

This agreement is based on the opinions of the parties' experts and on the external scientific publications submitted or cited by the parties.[6] In other words, there is agreement on numerous scientifically accepted aspects of potassium formate. There is nothing about Claim 14

[6] For this reason, the Court has no reason to believe that Agrigenix and Mahoney would disagree.

or the '179 Patent as a whole that suggests the term "potassium formate" should be construed in a manner contrary to the above generally accepted scientific aspects of the substance.

There does appear to be a dispute as to the appropriateness of representing potassium formate as ions. Dr. Maitra opined that aqueous potassium formate can be represented as HCO_2^- (aq) + K^+(aq) and (HCO_2K(aq)), and that another way of writing (HCO_2K(aq)) is (HCO_2^- (aq) + K^+(aq)). See Maitra 1st Dec. ¶ 34; Maitra 3d Dec. ¶ 5. Dr. Maitra also opined that Deerpoint's proposed chemical formulas/representations that identify ions (formate anions and potassium cations) are all appropriate methods of writing aqueous potassium formate. See Maitra 2d Dec. ¶ 9. Custom Ag's expert does not disagree with the general proposition that these are acceptable ways of writing potassium formate. Dr. Krauter utilized similar symbols to describe aqueous potassium formate when he opined that the "complete chemical equation for potassium formate dissolving in solution is expressed as: $CHO_2K \rightleftarrows (HCO_2)^- + K^+$." Krauter 1st Dec. ¶ 37. Moreover, Dr. Krauter testified that "if potassium formate alone is added to pure water, a certain amount of the potassium formate will dissolve and become $(HCO_2)^- + K^+$." Id. at ¶ 38. Thus, both experts express the concept of aqueous potassium formate in terms of formate anions plus potassium cations.

Deerpoint has expressed concern and spent a significant amount of its briefing to argue that Defendants are improperly attempting to limit "potassium formate" to molecular or solid salt potassium formate and imposing a restriction on how the potassium formate is made. However, Custom Ag does not argue that molecular potassium formate must somehow be used in the potassium-plus nutrient feedstock. Several times in their briefing, Custom Ag expressly states this and also accepts the chemical representation of potassium formate in aqueous solution, e.g. HCO_2K(aq), which would mean that there is no solid salt. Custom Ag also agrees that potassium formate can be synthesized with other substances, and the admission is not limited to the synthesis of molecular potassium formate. Therefore, the Court does not agree that Custom Ag is arguing that "potassium formate" in Claim 14 must refer to molecular potassium formate. Further, while Custom Ag argues that potassium formate must be an ingredient of the potassium-plus nutrient feedstock, neither Custom Ag nor Dr. Krauter argue that the potassium formate must be made or

synthesized in a particular way. The absence of such an argument is consistent with the '179 Patent. Claim 14 recites limitations on what comprises the potassium-plus nutrient feedstock/what the ingredients of the potassium-plus nutrient feedstock are. Nothing in Claim 14 or the '179 Patent as a whole set a requirement for how or through what method the potassium formate component of the feedstock is made. Therefore, the Court does not agree that Custom Ag is arguing that the "potassium formate" in Claim 14 must be made in a particular way.[7]

Custom Ag expressed concerns that Deerpoint is attempting to argue that any aqueous solution that contains a potassium anion and a formate anion can be called "potassium formate" irrespective of whatever else might be in the solution and irrespective of whether potassium formate is used to supply potassium cations and formate anions. However, Deerpoint has acknowledged that potassium formate is a required ingredient and clarified that its proposed expressions of aqueous potassium formate that identify ions refer only to potassium cations, formate anions, and water. See Doc. No. 138 at 10:3-10. Deerpoint further clarifies that when potassium formate is combined with an additional yield assist-constituent to become the potassium-plus nutrient feedstock, even though the feedstock solution would contain components and ions other than potassium cations and formate anions, Deerpoint would not refer to the solution as "potassium formate." Consistent with Deerpoint's briefing, Dr. Maitra's declarations do not state that other substances are involved in the "ionic representations" of potassium formate or that a solution with potassium cations and formate ions is potassium formate irrespective of what else might be in the solution. Therefore, the Court does not view Deerpoint as contending that a solution that contains potassium cations and formate anions is always properly referred to as "potassium formate" irrespective of the presence of other ions or substances.

[7] As stated above, Agrigenix and Mahoney did not file additional briefing and thus, did not respond to Deerpoint's briefing. It is possible to read Agrigenix and Mahoney's proposed construction as attempting to limit "potassium formate" to a molecular form because the chemical formula utilized by these defendants does not include an aqueous notation. To the extent that Agrigenix and Mahoney are contending that potassium formate must be utilized in molecular form, the Court agrees with Deerpoint that such a limitation is inappropriate. Such a limitation would exclude the seven examples in the specification because the seven examples utilize a 75 weight percent aqueous solution of potassium formate. Because that construction would exclude each example provided in the specification, and there is nothing about the '179 Patent to suggest such a construction is necessary, Agrigenix and Mahoney's proposed construction is improper. See GE Lighting Sols. v. AgiLight, Inc., 750 F.3d 1304, 1311 (Fed. Cir. 2014); Vitronics, 90 F.3d at 1583-84.

From the above, the Court is satisfied that there is material agreement as to what potassium formate is. That substantial agreement is based on scientifically accepted understandings of potassium formate, including its composition, potential physical forms (salt/molecular or aqueous solution), and ability to be synthesized. There is nothing from the language of Claim 14 or the '179 Patent as a whole to suggest that the term "potassium formate" is being used in a manner inconsistently from the general scientifically accepted understanding of potassium formate. Moreover, the plain language and the agreement of the parties make it clear that potassium formate must be an ingredient of the potassium-plus nutrient feedstock in Claims 14 and 16. Therefore, the Court concludes that Deerpoint's chemical representations are generally appropriate. However, in order to add clarity, the Court will describe potassium formate in general and differentiate denotations for molecular and aqueous potassium formate. Also, in order to further address concerns raised by Custom Ag, the Court will utilize an additional set of parenthesis with respect to the cation and anion formulations (just as Dr. Maitra did, see Maitra 3d Dec. ¶ 5) in order to show that a single "substance" is being referenced. Accordingly, the Court holds that the term "potassium formate" means: a chemical substance consisting of one hydrogen atom, one carbon atom, two oxygen atoms, and one potassium atom that may exist in molecular or salt form or in an aqueous form; molecular or salt potassium formate may be denoted as HCO_2K, HCOOK; aqueous potassium formate, i.e. potassium formate in a water solution, may be denoted as $HCO_2K(aq)$, $HCOOK(aq)$, $((HCO_2)^- + K^+)$, $((HCOO)^- + K^+)$, $((HCO_2)^-(aq) + K^+(aq))$, or $((HCOO)^-(aq) + K^+(aq))$.

4. "Additional Yield-Assist Constituent" (Claims 14 and 16)

Plaintiff's Arguments

Deerpoint argues that the '179 Patent at one point parenthetically refers to an additional yield-assist constituent as "at least one non-potassium formate constituent that is beneficial to the crop's nutrient-uptake and/or soil condition." This is an appropriate definition. The '179 Patent later provides numerous examples of specific constituents that could be used as an additional yield-assist constituent. Providing specific examples is not the same as limiting additional yield-assist constituents to the examples or clearly disavowing other substances that could be an

additional yield-assist constituent but that are not listed. Additionally, in reply, Deerpoint argues that there is nothing about the prosecution history that shows all potassium in the potassium-plus nutrient feedstock can only be derived from potassium formate.

Defendant's Arguments

Custom Ag argues that the specification and examples of potassium-plus nutrient feedstock identify a number of possible "additional yield assist constituents," but none of the examples include a substance that contains potassium. Moreover, through an amendment in response to a conditional rejection, Deerpoint is estopped from arguing that potassium in the potassium-plus nutrient feedstock can be derived from substances other than potassium formate. Therefore, an additional yield-assist constituent cannot contain potassium.

Proposed Constructions

a. Plaintiff's Construction

Deerpoint contends that no construction is needed as the trier of fact can fully understand the scope and meaning of the term as understood by one of ordinary skill in the art. Alternatively, Deerpoint proposes: "at least one non-potassium formate constituent that is beneficial to the crop's nutrient-uptake or soil condition."

b. Defendants' Construction

Agrigenix and Mahoney propose the following construction: "at least one non-potassium formate ingredient beneficial to the crop's nutrient uptake and/or soil condition that are limited to diammonium phosphate, ammonia, ammonium nitrate, phosphoric acid, formic acid, zinc disodium ETA, iron sodium ETA, copper disodium ETA, manganese disodium EDTA, AMPT, or EDTA."

Custom Ag proposes the following: "at least one non-potassium ingredient beneficial to the crop's uptake and/or soil condition."

Discussion

The Court does not agree that the term "additional yield-assist feedstock" does not require a definition. This term would be unknown to a POSITA with relevant expertise in the fields of chemistry and soil and water sciences. See Krauter 1st Dec. ¶ 28. There is also no indication in

the three declarations from Dr. Maitra that the term "additional yield-assist feedstock" has an accepted meaning in chemistry. Moreover, the meaning of the term is not obvious from the language of Claims 14 or 16. Therefore, construction of the term is appropriate.

a. Claim Language

The language of Claims 14 and 16 clearly places two limitations on "additional yield-assist constituents." First, because the potassium-plus nutrient feedstock is composed of both "potassium formate" and "additional yield-assists constituent(s)," the "additional yield-assist constituent(s)" logically must be something other than potassium formate. Otherwise, it would be possible for the potassium nutrient feedstock to be composed purely of potassium formate, which would read out of the concept of an "*additional* yield-assist constituent." Second, the Claims place limits on the amounts of additional yield-assist constituents in the feedstock. Additional yield-assist constituents are limited to 1 to 35 weight percent of the potassium nutrient feedstock. Claim 16 also limits the composition of the additional yield-assist constituent(s) to 90 to 100 weight percent of "N (as N), P (as P2O5), acid and combinations thereof." However, that limitation only applies to Claim 16, and the list of nitrogen, phosphorous, and acid is not exhaustive because the limitation is not set at 100 weight percent. It is possible for a substance other than nitrogen, phosphorous, and acid to make up the other possible 1 to 9 weight percent if either nitrogen, phosphorous, acid or combinations thereof make up less than 100 weight percent of the additional yield-assist constituent. No other limitations are found in the plain language of the Claims 14 and 16, including any limitation that would prohibit an "additional yield-assist constituent" from containing potassium.

b. Specification

In the summary section of the specification, the '179 Patent states: "The present invention provides a method for discontinuous emitter-irrigation potassium-plus fertigation . . . wherein a potassium-plus nutrient feedstock comprised of potassium formate, at least one non-potassium formate constituent that is beneficial to the crop's nutrient-uptake and/or soil condition ("additional yield-assist constituent") . . . ." '179 Patent at col. 3 ll. 21-28. Deerpoint is correct that this section supports its proposed construction.

Additionally, the specification lists a number of substances that qualify as an "additional yield-assist constituent." These substances are urea, zinc disodium EDTA, iron disodium EDTA, copper disodium EDTA, manganese disodium EDTA, diammonium phosphate, ammonia, ammonium nitrate, phosphoric acid, and formic acid. None of the examples include as an additional yield-assist constituent either potassium or a substance that contains potassium. However, as noted above, specifications need only teach one mode of making and using a claimed composition, Amgen, 314 F.3d at 1335, and it is not appropriate to incorporate limitations from the specification into a claim. Bradium Techs., 923 F.3d at 1049. Therefore, that all of the seven non-exclusive examples list additional yield-assist constituents that do not contain potassium does not mean that only non-potassium containing substances can be an "additional yield-assist constituent." See Bradium Techs., 923 F.3d at 1049; Amgen, 314 F.3d at 1335. Also, for these same reasons, it is inappropriate, as suggested by Agrigenix and Mahoney, to limit the additional yield-assist constituents to the non-potassium formate substances identified in the specification. See id.

c. Prosecution History

The amendments to original Claims 14 and 16 changed the measure of the amounts of additional yield assist-constituents, but did not change the term "additional yield-assist constituent(s)." Further, the explanations that accompanied Deerpoint's amendments do not indicate that particular substances (apart from potassium formate) cannot be "additional yield-assist constituents," nor do the amendments state that "additional yield assist constituents" cannot contain particular elements, specifically potassium. There is no evidence limit in the prosecution history on what the additional yield-assist constituent can be. Moreover, as discussed above, the prosecution history is not so clear that a POSITA would understand that Deerpoint disavowed the addition of potassium from sources that are in addition to potassium formate as part of the total composition of the potassium-plus nutrient feedstock. The amendments and Deerpoint's response clarified that the first ingredient of the potassium-plus nutrient feedstock has always been potassium formate. Therefore, the prosecution history does not indicate that only non-potassium containing substances can be an "additional yield-assist constituent."

d. Conclusion

Deerpoint's proposed construction excludes potassium formate as a possible "additional yield-assist constituent," Custom Ag's proposed construction excludes "non-potassium" substances as possible "additional yield-assist constituents," and Agrigenix and Mahoney's proposed construction limits "additional yield-assist constituents" to the substances listed in the examples of the specification. The language of Claims 14 and 16 does not support Defendants' various limitations. First, it is improper to limit what the additional yield-assist constituent might be on the basis of the '179 Patent's non-exclusive seven samples. Second, the prosecution history is not sufficiently clear to show that Deerpoint disclaimed/disavowed potassium formate as the only source of potassium in the potassium-plus nutrient feedstock or that Deerpoint represented to the USPTO that it (Deerpoint) understood that potassium formate could be the only source of potassium in the feedstock. Therefore, the Court concludes that the definition found in the specification, which is essentially Deerpoint's proposed construction, is appropriate. The term "additional yield-assist constituent(s)" means "at least one non-potassium formate constituent that is beneficial to the crop's nutrient-uptake and/or soil condition."

5. "N (nitrogen as N) and P (phosphorous as P2O5)" (Claim 16)

Plaintiff's Proposed Construction

Deerpoint contends that no construction is necessary. Alternatively, Deerpoint proposes that "N (nitrogen as N)" be construed to mean "nitrogen in any form, expressed in terms of an equivalent amount of nitrogen in the form of N," and that "P (phosphorous) be construed to mean "phosphorous in any form, expressed in terms of an equivalent amount of phosphorous in the form of P2O5."

Defendants' Proposed Construction

Agrigenix and Mahoney propose construing "N (nitrogen as N)" to mean "nitrogen as provided from urea, diammonium phosphate, ammonia, or ammonium nitrate," and propose construing "P (phosphorous as P2O5) to mean "the element phosphorous as part of the phosphate pentoxide (P2O5) provided from diammonium phosphate or phosphoric acid.

Custom Ag proposes construing "N (nitrogen as N)" to mean "nitrogen in any form not

containing potassium, expressed in terms of an equivalent amount of nitrogen in the form of N," and proposes construing "P (phosphorous as P2O5)" to mean "phosphorous in any form not containing potassium, expressed in terms of an equivalent amount of phosphorous in the form of P2O5."

Discussion

The Court does not find Agrigenix and Mahoney's proposed construction to be persuasive. As with other disputed terms, Agrigenix and Mahoney's proposed construction takes sources of nitrogen and phosphorous from the examples or specification and then attempts to limit the possible sources of nitrogen and phosphorous to those disclosed sources. This improperly limits the scope of the terms and patent and thus, is an inappropriate construction. See Bradium Techs., 923 F.3d at 1049; Amgen, 314 F.3d at 1335.

With respect to the constructions proposed by Custom Ag and Deerpoint, the constructions are very similar. The only difference between the two proposed limitations is that Custom Ag limits the construction of these two terms to exclude substances that contain potassium.

Custom Ag's limitation is based on the prosecution history and specification. However, as discussed above, the specification and the prosecution history (Deerpoint's representations to the USPTO and amendments) are insufficient for the Court to conclude that potassium formate can be the only source of potassium in the potassium-plus nutrient feedstock. Therefore, there is no basis for the Court to limit "N (nitrogen as N)" and "P (phosphorous as P2O5)" to substances that do not contain potassium.

The '179 Patent at times uses the N-P-K convention for fertilizer labels. Both Dr. Krauter and Dr. Maitra discuss and acknowledge this labeling convention, of which "N (nitrogen as N)" and "P (phosphorous as P2O5)" are a part. See Krauter 1st Dec. at ¶ 13; Maitra 1st Dec. ¶ 41. A POSITA would understand "N (nitrogen as N)" and "P (phosphorous as P2O5)" to be a reference to the N-P-K fertilizer labeling convention. The definitions urged by Deerpoint and Custom Ag (less the limitation regarding potassium containing substances) align with the N-P-K labeling convention. Therefore, the Court finds that: "N (nitrogen as N)" means "nitrogen in any form, expressed in terms of an equivalent amount of nitrogen in the form of N," and "P (phosphorous as

P2O5)" means "phosphorous in any form, expressed in terms of an equivalent amount of phosphorous in the form of P2O5."

6. "Acid"

Plaintiff's Proposed Construction

Deerpoint argues that no construction of this term is necessary and that a lay person's understanding of the term is sufficient.

Defendants' Proposed Construction

Agrigenix and Mahoney contend that the term "acid" should be construed to mean "phosphoric acid, formic acid, or a combination of the two."

Custom Ag argue that the term acid requires no construction, other than to limit the term to acids that do not contain potassium. See Doc. No. 132 at 21:14-17.

Discussion

Agrigenix and Mahoney's proposed construction takes acids identified in the examples or specification and then attempts to limit the acids that could form an "additional yield-assist constituent" to those specific acids. This improperly limits the scope of the terms and patent and thus, is an inappropriate construction. See Bradium Techs., 923 F.3d at 1049; Amgen, 314 F.3d at 1335.

As for Deerpoint and Custom Ag's positions, the Court has explained that there is an insufficient basis in the prosecution history, specification, and claim language to limit the source of all potassium in the potassium-plus nutrient feedstock to potassium formate. With the rejection of that limitation, Custom Ag and Deerpoint agree by default that no construction of the term "acid" is necessary. Therefore, the Court concludes that no construction of the term "acid" is necessary.

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ORDER

Accordingly, IT IS HEREBY ORDERED that:

1. The term "treated irrigation water" is construed to mean "irrigation water that has had a potassium-plus nutrient feedstock added to it."
2. The term "potassium-plus nutrient feedstock" is construed to mean " an aqueous fertilizer mixture comprised of potassium formate and at least one additional yield-assist constituent."
3. The term "potassium formate" is construed to mean "a chemical substance consisting of one hydrogen atom, one carbon atom, two oxygen atoms, and one potassium atom that may exist in molecular or salt form or in an aqueous form; molecular or salt potassium formate may be denoted as HCO_2K or HCOOK; aqueous potassium formate, i.e. potassium formate in a water solution, may be denoted as $HCO_2K(aq)$, HCOOK(aq), $((HCO_2)^- + K^+)$, $((HCOO)^- + K^+)$, $((HCO_2)^- (aq) + K^+ (aq))$, or $((HCOO)^- (aq) + K^+ (aq))$."
4. The term "additional yield-assist constituent" is construed to mean "at least one non-potassium formate constituent that is beneficial to the crop's nutrient-uptake and/or soil condition."
5. The term "N (nitrogen as N)" is construed to mean "nitrogen in any form, expressed in terms of an equivalent amount of nitrogen in the form of N."
6. The term "P (phosphorous as P2O5)" is construed to mean "phosphorous in any form, expressed in terms of an equivalent amount of phosphorous in the form of P2O5."
7. The term "acid" is sufficiently clear and needs no construction.
8. The term "from 10 to 50 wt. percent" means "where the weight of the subject ingredient is between 10 percent and 50 percent of the weight of the overall mixture, including the ingredient."
9. The term "from 1 to 35 wt. percent" means "where the weight of the subject ingredient is between 1 percent and 35 percent of the weight of the overall mixture, including the ingredient."
10. The term "from 90 to 100 weight percent" means ""where the weight of the subject

ingredient is between 90 percent and 100 percent of the weight of the overall mixture, including the ingredient."

IT IS SO ORDERED.

Dated: December 30, 2021

SENIOR DISTRICT JUDGE