

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYNGENTA CROP PROTECTION AG,
Petitioner,

v.

UPL LTD,
Patent Owner.

PGR2023-00017
U.S. Patent No. 11,445,727

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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<i>Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC</i> , 683 F.3d 1356 (Fed. Cir. 2012)	10

EXHIBIT LIST

Ex. No.	Description
1001	U.S. Patent No. 11,445,727 (“the ’727 Patent”).
1002	Selected Excerpts of the File History of the ’727 Patent
1003	Declaration of Phillip M. Brannen, Ph.D.
1004	Godoy et al. “Eficiência de fungicidas multissítios no controle da ferrugem-asiática da soja, <i>Phakopsora pachyrhizi</i> , na safra 2015/16: resultados sumarizados dos ensaios cooperativos”, Londrina, PR Agosto 2016 (Embrapa Soja, Circular Técnica, 121) (“Godoy”)
1005	Certified Translation of Godoy “Efficiency of multisite fungicides in controlling Asian soybean rust, <i>Phakopsora pachyrhizi</i> , in the 2015/16 harvest: summarized results of cooperative trials”, Londrina, PR August 2016 (Embrapa Soja, Circular Técnica, 121)
1006	U.S. Patent No. 9,314,022 to Tobler et al. of Syngenta (“the ’022 Patent” or Tobler)
1007	WO Application Pub. No. 2015/079334 to De Oliveira of UPL, Ltd (the “WO’334” or “De Oliveira”)
1008	Wiglesworth et al. “Solatenol™ fungicide – a new SDHI fungicide from Syngenta” <i>Phytopathology</i> (2015) 105(Supl. 2) No. 4, p. S2.11 (“Wiglesworth”)
1009	Elatus EPA Reg. No. 100-1480 dated 8/28/2015 (“Elatus EPA Label”)
1010	Gullino et al. “Mancozeb Past, Present, and Future”, <i>Plant Disease</i> (2010) Vol. 94, No. 9, pp. 1076-1087 (“Gullino”)
1011	The Pesticide Manual, 17 th Ed. Turner, J.A. Editor (2015), excerpted monographs

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1012	Colby, S.R., “Calculating Synergistic and Antagonistic Responses of Herbicide Combinations”, Weeds, Vol. 15, No. 1 (1967) pp. 20-22 (“Colby”)
1013	Gisi et al. “Synergistic Interactions of Fungicides with Different Modes of Action”, Trans. Br. Mycol. Soc. (1985) 85(2), pp. 299-306 (“Gisi”)
1014	Levy et al. “The joint action of fungicides in mixtures: comparison of two methods for synergy calculation”, European and Mediterranean Plant Protection Organization (EPPO) Bulletin (1986) 16(4), pp 651-657 (“Levy”)
1015	Koller et al. “Evaluation of Tactics for Managing Resistance of <i>Venturia inaequalis</i> to Sterol Demethylation Inhibitors”, Plant Disease (1999) pp 857-863 (“Koller”)
1016	Emery et al. “Assessment of interactions between components of fungicide mixtures against <i>Monilinia fructicola</i> ”, Crop Protection (2002) 21, pp 41–47 (“Emery”)
1017	Moura et al., “Effects of cyproconazole, azoxystrobin and mineral oil on soybean leaf anatomy”, Dourados (2013) v.6, n.20, p.154-160 (“Moura”)
1018	Della Vechia et al., “Physical characteristics of insecticide spraying liquids with mineral oil and droplets formed on citrus leaves”, Citrus Research & Technology, (2016) v. 37, n. 1, pp. 102-107 (“Della Vechia”)
1019	Declaration of Sylvia Hall-Ellis, Ph.D.
1020	Declaration of Caio Prates
1021	Declaration of Gilson Aparecido Hermenegildo de Oliveira submitted in U.S. Patent App. Ser. No. 15/673,316
1022	Supplemental Declaration of Sylvia Hall-Ellis, Ph.D.
1023	Declaration of Ryan Kody Jones

Ex. No.	Description
1024	Brazilian trademark, Process No.: 007161867, registration for NIMBUS, class 1 registration
1025	Certified translation of Ex. 1024, Brazilian trademark registration of NIMBUS
1026	Brazilian trademark, Process No.: 200012975, registration for NIMBUS, class 5 registration
1027	Certified translation of EX1026, Brazilian trademark registration of NIMBUS
1028	NIMBUS material safety and data sheet (MSDS)
1029	Certified translation of EX1028, NIMBUS MSDS
1030	Machado <i>et al.</i> “Is tank mixing site-specific premixes and multi-site fungicides effective and economic for managing soybean rust? a metaanalysis,” Crop Protection, Volume 151, 2022, 105839 (pp. 1-9) (“Machado”)
1031	Severity Data Related to EX1020 CONFIDENTIAL – ATTORNEY’S EYES ONLY
1032	Additional Severity Data Related to EX1020 CONFIDENTIAL – ATTORNEY’S EYES ONLY
1033	Yield, Defoliation, and Phytotoxicity Data Related to EX1020 CONFIDENTIAL – ATTORNEY’S EYES ONLY
1034	Submission by UPL to the European Patent Office in support of a European Patent (EP 3073826) which claims priority to the same Indian application (1336/KOL/2013) as Oliveira (EX1007)
1035	Affidavit by De Oliveira dated Aug. 7, 2023 submitted by UPL in the Indian Patent Office in support of the Indian priority application (1336/KOL/2013) to the Oliveira (EX1007)

Ex. No.	Description
1036	Intentionally Omitted
1037	Intentionally Omitted
1038	Submission and affidavit by Oliveira from UPL dated Oct. 4, 2019, to the Indian Patent Office in support of the Indian priority application (1336/KOL/2013) to the Oliveira (EX1007)
1039	Intentionally Omitted
1040	U.S. Patent No. 9,205,115 B2 to Barry J. Jacobsen
1041	U.S. Patent Application Pub. No. 2017/0086454 A1
1042	U.S. Patent Application Pub. No. 2016/0212993 A1
1043	Transcript of the deposition of Barry J. Jacobsen, Ph.D. (Jan. 10, 2024)
1044	Intentionally Omitted
1045	Email correspondence exchanged between the parties regarding discovery related to examples in the '727 patent
1046	“association,” Webster’s New Twentieth Century Dictionary (2 nd ed. 1975)
1047	“association,” Merriam-Webster’s Collegiate® Dictionary (10 th ed. 1998)

I. INTRODUCTION

UPL's Patent Owner's Response (Paper 31/Paper 32, "POR") and supporting declaration of Jacobsen fail to provide a basis for finding claims 1-10 of U.S. Patent 11,445,727 ("the '727 patent") valid. UPL contends that neither Tobler nor Godoy anticipates the claims, and that Oliveira does not make the claims obvious. UPL's arguments are not only wrong as a matter of law, but are in fact, contrary to the evidence.

Neither UPL nor its expert try to argue or specifically state that UPL was the first to combine mancozeb with azoxystrobin and benzovindflupyr to treat soybean rust. Tobler and Godoy did. Instead, UPL makes their arguments and attacks as to clarity or alleged ambiguities in the prior art. Yet, at the same time, UPL does not disclose in this proceeding that they have previously represented to the Indian Patent Office that Godoy was "the first trial," after the publication of Oliveira, disclosing for the first time the role of mancozeb with mixtures of triazoles and/or strobilurins and/or SDHIs for achieving a superior control of Asian soybean rust. EX1038, 151-153.

Neither UPL nor its expert Jacobsen argue that the limited testing provided in the '727 patent is representative of synergy or the scope of the claim. In fact, UPL has specifically withdrawn any substantive reliance on the examples of the '727 in this proceeding. Paper 40, 2; Paper 39, 3. Rather, UPL relies on arguments

that synergy is not an element of the claim. *See* POR, 79-80. However, this ignores the fact that unexpected results/synergy was their argument used to overcome the Examiner's *prima facie* case of obviousness, (EX1002, 197) and as such, must be commensurate with the scope of the claims.

Further, UPL's Response is unsupported by and in conflict with Jacobsen's testimony, and is inconsistent with UPL's own/prior representations to Indian, European, and US Patent Offices.

II. CLAIM CONSTRUCTION

A. "combination", "composition", and "fungicidal combination"

UPL equates the three terms, "combination", "composition", and "fungicidal combination," arguing "[t]hese terms should be construed consistent to mean ... fungicides together in a single mixture." POR, 5-7. UPL's support that the three terms should be construed to require the fungicides together in a single mixture relies on a single quote from the '727 patent. *Id.* at 6 (citing EX1001, 19:54-60).

UPL's argument and quote ignore two things. First, the language quoted from the specification presents options: "*may* be sold as a pre-mix," "*may* be mixed before", or "*may* be tank mixed before." EX1001, 19:54-60. This language does not require that the components be mixed. Put alternatively, as UPL might argue: the portion of the specification quoted, does not exclude sequential application.

Second, UPL’s citation to the specification contradicts and ignores the next paragraph. The next paragraph states: “the composition of the present invention may be applied simultaneously as a tank mix or a formulation **or may be applied sequentially.**” EX1001, 19:61-63 (emphasis added). Logically, if “simultaneously” refers to “tank mix or a formulation” then “sequentially” refers to separate applications of fungicides. This is how a person of ordinary skill in the art would interpret the terms. EX1003, ¶¶76-77; EX2021, 183:3-185:11.

This construction of the ’727 claims to cover both simultaneous tank mix applications as well as sequential applications is consistent with the prosecution history of the ’727 patent—which UPL ignores. During examination, the Office made rejections citing *Gewehr* noting it discloses “[t]he application of active compounds ... can be [] simultaneously, that is jointly or separately, or in succession.” EX1002, 208. In addition, the Office rejected claims over *Kemmitt* (U.S. Patent Application Publication 2015/0181870) finding *Kemmitt* discloses “[t]he components of the said synergistic mixture can be **applied** either separately or as part of a **multipart fungicidal system....**” EX1002, 151 (emphasis in original). UPL did not challenge the Office’s interpretation of the claims as encompassing sequential application.

B. “consisting of”

UPL contends the term “consisting of” means “no other fungicides.” POR,

8. If that were all UPL contends, Petitioner would agree. However, as applied by UPL, the claim interpretation would appear to exclude the use of the *adjuvant* mineral oil. UPL takes the position that any adjuvant that may exhibit fungicidal activity in some other context—beyond the composition in question—is a fungicide, and therefore, must be excluded. POR, 8; *see also id.* at 19-22. However, under this interpretation, it is unclear what would not be a fungicide. For example, any powder or oil adjuvant that is being used as an adjuvant but could theoretically be a fungicide elsewhere—in a different context—would be excluded. This apparent reading of the claims is both contrary to the disclosure and inherently indefinite.

The '727 patent identifies numerous acceptable adjuvants and carriers including oils, generally, *e.g.*, “oil in water emulsions”, “water in oil emulsions”, “oil dispersions,” and petroleum aliphatic hydrocarbons and vegetable oils, specifically. EX1001, 16:29-31, 16:47-49. In fact, when UPL’s expert was asked if methylated soybean oil—a known vegetable oil adjuvant expressly disclosed as such in the '727 patent (EX1001, 16:47-48) —was a fungicide, he stated:

A. I don’t know. I’m not going to – my guess and knowledge of plant oils it might have — not great fungicidal activity, but it might have some fungicidal activity.

EX1043, 202:18-203:1. This inability to provide an answer highlights the

indefiniteness inherent in UPL's proposed claim interpretation.

III. UPL MISCHARACTERIZES TOBLER AND MISSTATES THE LAW AS TO ANTICIPATION

UPL mischaracterizes both Tobler and the applicable caselaw in its attempt to avoid Tobler's anticipation of the '727 claims. In particular, UPL: 1) ignores the express disclosure of Tobler; 2) misapplies and misrepresents the caselaw as to anticipation and "envisage"; 3) mischaracterizes Dr. Brannen's testimony; and 4) is contradicted by its own expert Jacobsen's testimony.

As the Board found in the Institution Decision (Paper 8, "ID"), Tobler discloses a list of compounds rather than genera. *See ID*, 14-15. Thus, the caselaw cited by UPL regarding the need to show that one of ordinary skill in the art would 'at once envisage' each member of a disclosed genus is inapplicable. *See id.* Rather than address the Board's findings, UPL doubles down on its meritless argument, again mischaracterizing both Tobler and Federal Circuit caselaw.

Notwithstanding UPL's insistence that Tobler discloses only a genus, and not specific fungicidal combinations that fall squarely within the claims of the '727 patent, Tobler plainly shows otherwise. There is no dispute that claims 1 and 3-10 of the '727 patent cover fungicidal combinations consisting of three active fungicidal ingredients— benzovindiflupyr, mancozeb, and "at least" one other fungicide from a list of fungicides delineated in the claims. EX1001, 21:40-61,

22:17-23:29. And there can be no dispute that Tobler discloses exactly that, rendering the '727 claims invalid as anticipated.

Tobler is directed to "...novel fungicidal compositions suitable for control of disease caused by phytopathogens, especially phytopathogenic fungi...." EX1006, 1:9-11. Tobler discloses that "compositions according to the present invention which comprise three active ingredients are defined as embodiments E1 and E2." *Id.* at 28:6-8; *see also id.* at 29:41-43. Embodiment E1, according to Tobler, can consist of "mancozeb+TX1" where TX1 in turn consists of "the compound A-1.1 + a compound selected from group P." *Id.* at 28:9-11, 28:40. UPL and its expert Jacobsen, agree that Tobler defines compound A-1.1 as benzovindiflupyr. EX1043, 46:4-7; *see also* EX1006, 13:9-11.

Thus, as a threshold matter, and mirroring exactly the claims of the '727 patent, both parties agree that Tobler expressly discloses a fungicidal combination consisting of benzovindiflupyr, mancozeb, and a fungicide selected from Group P. In fact, UPL's expert, Jacobsen, testified as follows:

Q. So putting those together, you would agree that an example of embodiment E1 listed in Tobler would be mancozeb plus compound A-1.1 plus a compound selected from group P; is that fair?

A. That specific example, yes.

Q. Now, focusing on compound A-1.1 as it's referenced in Tobler, you understand that that compound is benzovindiflupyr, correct?

A. Yes.

EX1043, 45:21-46:7.¹

Jacobsen further agreed that “Tobler provides a list of the members of what it defines as group P,” (*id.* at 47:13-15) and identified the beginning and ending of the group P list in the Tobler reference:

¹ UPL falsely asserts that Petitioner's expert, Dr. Brannen, “admit[ed] that Tobler provides no examples with three active ingredients and does not use mancozeb in any biological examples.” POR, 25 (citing EX2021, 114:7-115:6). However, the cited deposition testimony, per the direction provided by UPL counsel's questioning, focused exclusively on whether certain examples in columns 39 and 40 of Tobler included three active ingredients or mancozeb. *See id.* Contrary to UPL's misleading representation to the Board, Dr. Brannen has never suggested that Tobler does not disclose the use of combinations involving three active ingredients and/or mancozeb. Indeed, Dr. Brannen reads Tobler just as Jacobsen did in his deposition excerpted above; namely, as disclosing three active ingredient combinations consisting of bendovindiflupyr, mancozeb, and a compound selected from the group P list. EX1003, ¶¶ 91-94, 141-142.

Q. So just to clarify, Tobler's listing of the group P members starts at column 22, line 60; is that correct?

A. Or 61, whichever – however you read it. 60 looks like it's blank.

Q. Okay.

A. But it's right below that.

Q. All right. And then where does the list of group P members end in Tobler?

A. I believe at the bottom of column 24. Or, actually, bottom of 25.

Q. Okay. So the list runs through column 25, line 67; is that correct?

A. Yes.

EX1043, 47:21-48:15.

Finally, Jacobsen agreed that the group P list in Tobler includes azoxystrobin (*id.* at 48:22-49:5), cyproconazole (*id.* at 49:7-15), and picoxystrobin (*id.* at 49:18-50:4)—all fungicides listed in the claims of the '727 patent. EX1001, 21:45-46, 21:56, 21:57, 22:33-34, 22:44, 22:45, 23:11-12, 23:23, 23:24. In fact, as Petitioner previously identified, Tobler's group P list includes 47 of the 55 fungicides in the claims of the '727 patent. EX1003, ¶¶143-144.

Because Tobler expressly identifies particular fungicidal combinations that fall within the scope of independent claims 1, 5, and 10 of the '727 patent, the

claims are invalid as anticipated.² Thus, all of UPL’s arguments regarding (1) the purported efficacy, compatibility, and/or phytotoxicity of Tobler’s disclosed fungicidal combinations as viewed by a person of ordinary skill in the art (POR, 25-26; EX2020 ¶¶157-168) and (2) whether a person of ordinary skill in the art would be motivated to choose particular disclosed combinations in Tobler over other combinations also disclosed in Tobler (POR, 26-30, 34; EX2020, ¶¶140-156) are completely irrelevant.

As this Board explained in its institution decision, Federal Circuit precedent draws a distinction between prior art that discloses only a genus of compounds, where the issue is whether “the reference describing the genus anticipates every species within that genus,” and prior art that discloses a list of individual compounds. ID, 14. When only a genus is disclosed, the question is whether “the class of compounds that falls within the genus is so limited that a person of skill in

² To the extent the terms “combination” and “composition” are construed to require a tank mix of the disclosed compounds, Tobler discloses that “composition” as used therein includes both a “tank-mix” and application “in a sequential manner.” EX2021, 193:10-194:15; *see also* EX1006, 27:55-64. Tobler further describes the three active ingredients of embodiments E1 and E2 as “mixing partners”. EX1006, 29:41-45.

the art can at once envisage each member of this limited class. *Id.* quoting *In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009). By contrast, when an individual list is disclosed, what a person of ordinary skill in the art would “at once envisage” does not come into play because one need not “envisage” the members of the list; they are individually disclosed. It does not matter whether a disclosed member of the list “appears without special emphasis in [the] list.” *Id.* quoting *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376 (Fed. Cir. 2005). The express disclosure of a particular combination or composition that meets all of the limitations of a claim anticipates that claim even if disclosed as part of a larger undifferentiated list. *Id.* at 15-16.

In its effort to distinguish *Perricone*, UPL relies heavily on *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356 (Fed. Cir. 2012), but inexplicably cites only to the dissent in the case, mischaracterizing it as a concurrence. POR, 33 (quoting from 683 F.3d at 1371-1372, which UPL describes as “(Newman, P, concurring)”). UPL also relies on *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 851 F.3d 1270 (Fed. Cir. 2017), but again, completely misrepresents its holding. *Id.* at 30-31. UPL cites to pages 1274-1275 of *Nidec*, describing it as “reversing Board’s anticipation finding where ground reference disclosed five binding agents (one claimed) and three coating techniques (one claimed) and taught that any of the five binding agents could be used together.” *Id.*

at 31. However, UPL is describing the *Nidec* panel's discussion of a ***different*** case (*Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1382-1383 (Fed. Cir. 2015)), in which, contrary to UPL's representation, the Federal Circuit ***upheld*** the Board's anticipation finding based on the above facts. *Nidec*, 851 F.3d at 1274. While the court did reverse the Board's anticipation finding, it did so because the prior art reference simply failed to disclose a claim limitation in its entirety. *Id.* *Nidec* did not involve prior art disclosing either a genus or list of alleged anticipating combinations.

Finally, UPL relies on *Mylan Pharms. Inc. v. Merck Sharp & Dohme Corp.*, 50 F.4th 147 (Fed. Cir. 2022), but *Mylan* involved a disclosed genus of compounds, not a disclosed list of individual compounds. *Id.* at 30 (citing *Mylan*, 50 F.4th at 153-154). In *Mylan*, the prior art disclosed the genus of pharmaceutically acceptable salts formed when reacting sitagliptin with phosphoric acid but did not disclose the particular salt recited in the claims. *Mylan*, 50 F.4th at 151. Moreover, the evidence in that case "undeniably showed" that the claimed salt does not always form. *Id.*

Unlike the prior art in *Mylan*, Tobler expressly discloses multiple individual combinations, each of which meets all of the limitations of independent claims 1,

5, and 10 of the '727 patent.³ Tobler does not involve the disclosure of only a broad genus with experimental uncertainty as to the individual compounds within that genus.

IV. UPL'S ARGUMENTS TO AVOID GODOY ARE INCONSISTENT AND UNSUPPORTED

UPL presents several meritless arguments in their effort to avoid anticipation of the claims by Godoy.

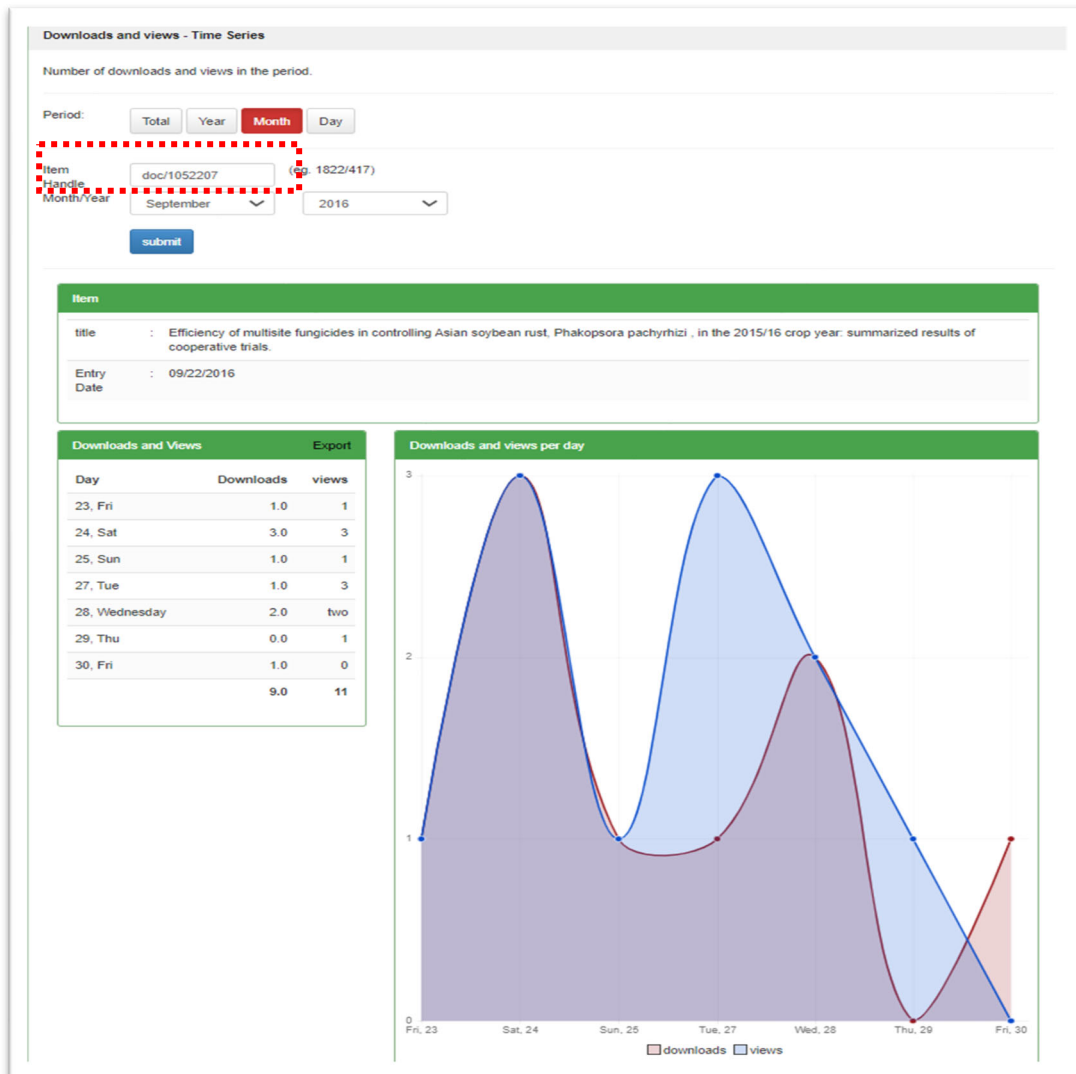
A. Godoy was Publicly Available and Accessible Prior to November 4, 2016.

UPL does not and cannot state Godoy was not publicly accessible prior to November 4, 2016. Rather, UPL argues there is no evidence to support the public availability of Godoy prior to November 4, 2016. POR, 8-15. This is incorrect. As stated by UPL, Petitioner need only show public availability by a preponderance of the evidence. *Id.* at 8. Petitioner maintains this threshold was met at the time of the original petition, but under the more developed record is now undeniable.

³ Rather than address Tobler's disclosure with respect to dependent claims 3-4 and 6-9 of the '727 patent, UPL rehashes the same deficient "genus"-based argument for these claims. As explained in the Petition, dependent claims 3-4 and 6-9 are anticipated by Tobler. Paper 2, 27-51.

First, the face of Godoy states a publication of August 2016. EX1004, 1; EX1005, 2. In fact, UPL has represented outside of this proceeding that Godoy was “published August 2016.” EX1038, 151 (“Paper 16 [Godoy] was published August 2016.”); EX1043, 87:16-93:1.

Second, Embrapa provides statistics on publications and shows actual access prior to November 4, 2016—beyond the standards required by law:



EX1022, 3.

Third, UPL's expert Jacobsen, testified that Embrapa—the publisher of Godoy—is the Brazilian equivalent of the U.S. Department of Agriculture. EX1043, 52:20-53:8. Moreover, Jacobsen testified that, as a plant pathologist, he has personally monitored and read Embrapa publications for years, emphasizing that “any good scientist” would do so. *Id.* at 55:20-57:11.

Fourth, evidence shows that UPL regularly monitors Embrapa publications. *See* EX1021. This includes the publications of Godoy herself stating, *inter alia*, Godoy is “renowned and highly published scientist in the field of fungicidal combinations.” EX1021, 6 (paragraph 13).

Rather than attempt to directly rebut the above evidence through a librarian expert of its own, UPL relies on its technical expert Jacobson. POR, 10 (citing EX2020); EX2020, ¶¶88-90. Yet, Jacobsen testified that he has no expertise in library science, the indexing and cataloguing of documents for publication, and does not consider himself competent to opine on such matters. EX1043, 50:5-51:18.

Consistent with the August 2016 publication date, which UPL itself asserted in other proceedings, the evidence here shows Godoy was publicly accessible prior to November 2016. As explained above, UPL itself shows a POSA would follow Godoy and can find and access the Godoy reference. Further, Petitioner's expert,

Dr. Hall-Ellis, provided supplemental evidence that Godoy was publicly accessible before November 2016, which included additional evidence showing Godoy was searchable, indexed and accessible by: (i) a MARC record; (ii) a Dublin Core record; (iii) online statistics; and (iv) Godoy's availability on ResearchGate.

EX1022. UPL failed to address the Hall-Ellis supplemental declaration and evidence therein.

B. Godoy Discloses Fungicidal Combinations and Compositions as Tank Mixes.

Unable to directly address Petitioner's substantive arguments, UPL mischaracterizes Godoy. Specifically, UPL contends Godoy provides for sequential applications rather than "combinations" as in the '727 claims. POR, 16-17. Even assuming, *arguendo*, UPL's narrow claim construction of "combination," "composition," and "fungicidal combination," this assertion is inaccurate.

The undisputed certified English translation of Godoy states as a first sentence introducing the treatments in the "Materials and Methods" section: "[w]ith the objective of evaluating the efficiency of multisite fungicides, isolated and associated, two protocols were carried out...." EX1005, 3. Godoy then states the "first protocol was carried out with the isolated fungicides alone (Table 2) and the second [protocol] with the products used in association with the fungicides ...

(Table 3)).” *Id.* Godoy makes it clear—the fungicides in Table 3 were used in combination, *i.e.* associated with each other in the tank-mix sprayer she described. Godoy does not mention or describe sequential treatments, which as Dr. Brannen has explained, a person of ordinary skill would expect if such procedures were employed. EX2021, 191:4-192:2; *see also id.* at 187:18-191:1 (explaining that a person of ordinary skill would read Table 3 to describe a tank-mix application.)

UPL’s contention that Godoy’s usage of the word “association” (associados), implies separate treatments were used to apply mancozeb and the other fungicides, is not only unsupported but is contradicted by its own expert’s declaration. Jacobsen relies on the plain and ordinary meaning of the word “combination” as defined in Webster’s, *i.e.* “as ‘the act of combining or state of being combined ... a union of separate parts.” EX2020, ¶74 (emphasis added). However, neither UPL nor Jacobsen provide Webster’s definition of “association” which older versions define “association” as “**union.**” EX1046 (emphasis added). Applying UPL’s own methodology for plain and ordinary meaning, the word “association,” means union, which UPL and Jacobsen equate to combination. A more recent Webster’s defines “association” as “combination.” EX1047. Both definitions are before November 2016—and nothing could be more clear.

Indeed, UPL itself in other proceedings understood Godoy disclosed applying a mixture of the disclosed fungicides. EX1021; EX1043, 118:11-120:14;

EX1035, 59-61; EX1038, 151-153 (discussing Paper 16 (Godoy): “[t]his paper notes a marked reduction in severity of soybean rust and yield of soybean in treatments which were inclusive of a multisite contact fungicide in addition to the mixture of triazoles and/or strobilurins and/or SDHIs” (emphasis added)). In addition, UPL’s expert, Jacobsen, has admitted that people of ordinary skill interpret Godoy as disclosing a tank mix. EX1043, 121:21-126:17; EX1030, 2 (disclosing Godoy used a tank mix); *see also* EX1003, ¶¶117-118; EX2021, 187:18-192:1.

UPL’s further argument regarding footnote 1 in Table 3 that “Nimbus was added to azoxystrobin+benzovindiflupyr (Elatius) but not to mancozeb” is without merit. POR, 17. Review of Tables 2 and 3 show that when mancozeb was used alone, the adjuvant Agris was included (Table 2, footnote 1). EX1005, 3. Yet, when mancozeb was combined with azoxystrobin+ benzovindiflupyr, this adjuvant was not needed since the adjuvant Nimbus was added to the mixture.

C. Godoy Discloses Combinations with Three Active Ingredients and Nimbus as a Mineral Oil Adjuvant.

Finally, UPL argues that Godoy’s use of Nimbus places the Godoy fungicidal combinations outside the scope of the ’727 claims. POR, 19-22. However, Godoy discloses Nimbus as an adjuvant only, and not as an active ingredient in the fungicidal combinations described therein. As can be seen from

EX1028/EX1029, the Material Safety Data Sheet (MSDS) for Nimbus, the Brazilian Nimbus product is a mineral oil adjuvant, and not a “sulfur fungicide” as represented by UPL. *See also* EX1023; EX1024; EX1025; EX1026; EX1027.

Nimbus as a mineral oil adjuvant is consistent with Godoy, and also consistent with the use of Nimbus by others. UPL’s expert Jacobsen has acknowledged that Syngenta’s U.S. patent applications describe Nimbus as an inert mineral oil adjuvant with data showing no fungicidal activity. EX1043, 160:15-165:18 (discussing EX1041 and EX1042). Further, Jacobsen’s own patent describes mineral oil as an inert carrier. EX1043, 155:15-158:21 (discussing EX1040). Finally, the ’727 patent defines carriers to include “petroleum aliphatic hydrocarbons” which Jacobsen confirmed includes mineral oil. EX1043, 171:11-172:9. As such, a person of ordinary skill in the art would have understood petroleum aliphatic hydrocarbons, which include mineral oils, are not fungicides and not excluded from the ’727 patent claims.

UPL argues that the mineral oil Nimbus *could* act as a fungicide and thus would be excluded by the claim language “consists of.” POR, 19-22; EX2020, ¶¶116-132. Yet, as cited above, Jacobsen’s own patent refers to mineral oil as an inert carrier—not a fungicide. Further, the references relied on by Jacobsen are directed to powdery mildew in non-soybean plants, rather than soybean rust. *See* EX2020, ¶125; *see also* EX1043, 142:3-17. Finally, Jacobsen admits that the

concentration data he relies on to suggest that the Nimbus disclosed in Godoy could have fungicidal activity is insufficient to draw any such conclusions.

EX1043, 144:13-150:3.

Neither UPL nor Jacobsen have presented any evidence whatsoever that oils control soybean rust. As such, their arguments as to whether or not mineral oil can act as a fungicide in some other contexts are irrelevant with regards to Nimbus and its activity as disclosed in Godoy. Therefore, for all the reasons addressed above, a person of ordinary skill would understand Nimbus, as disclosed in Godoy, to be an adjuvant rather than a fungicide against soybean rust.

V. UPL’S ARGUMENT THAT OLIVEIRA “EXCLUDES” BENZOVINDIFLUPYR IS CONTRADICTED BY OLIVEIRA’S OWN DECLARATION TO THE INDIAN PATENT OFFICE

UPL argues that although “benzovindiflupyr ‘is an SDHI’”, that is “not a reason to select it over those disclosed in—and preferred by—De Oliveira.” POR, 57. UPL attempts to bolster this argument using Jacobsen to opine that a person of ordinary skill would not have been motivated to contradict the preferred list in Oliveira and use benzovindiflupyr. EX2020, ¶¶207-208.

UPL’s statement and argument on this point is in stark contrast to what Oliveira himself represented under oath to the Indian Patent Office. EX1038 is a declaration by Oliveira submitted to the Indian Patent Office in support of patentability of the Indian application corresponding to De Oliveira (EX1007).

Oliveira refers to a combination of azoxystrobin + benzovindiflupyr in the table.

EX1038, 83-84. Oliveira uses this combination to illustrate his alleged patentability. EX1038, 79-84. Azoxystrobin is labelled “S” for strobilurin and benzovindiflupyr is labelled “SDHI.” EX1038, 79-84. Oliveira, who Jacobsen recognized to be a person of ordinary skill (EX1043, 120:8-14), considers benzovindiflupyr an SDHI within his invention.

VI. THE FOUR-WAY COMBINATIONS OF CLAIM 2 ARE OBVIOUS

Tobler specifically discloses 3- and 4-way combinations. Paper 2, 34-35. Despite this, UPL relies on “consisting of” to exclude other group P components. POR, 36. However, Petitioner does not rely on a 5-way combination and say it would be obvious to remove a fungicide. Petitioner does not need to because the elements are already met. UPL’s claim does not become patentable merely because Tobler did not recite “no other fungicides should be used.”

VII. THERE ARE NO SECONDARY CONSIDERATIONS SHOWING NONOBVIOUSNESS OF THE ’727 PATENT

In their attempt to overcome the obviousness of claims 1-10, UPL asserts (1) the ’727 patent meets a long-felt but unmet need and (2) there is evidence of “unexpected synergistic effects [] reflected in data from Petitioner’s own experiments....” POR, 70. Both arguments fail.

As a threshold matter, UPL does not even attempt to allege their evidence is reasonably commensurate in scope with the claims of the ’727 Patent. *South*

Alabama Med. Science Foundation v. Gnosis S.P.A., 808 F.3d 823, 827 (Fed. Cir. 2015) (objective indicia evidence must be reasonably commensurate with the scope of the claims). As explained below, UPL’s alleged objective indicia is irrelevant as not reasonably commensurate with the scope of the ’727 patent claims.

A. No Long-Felt But Unmet Need

UPL’s attempt to establish long-felt but unmet need is defective for multiple reasons—most notably that the problem had already been solved. If the prior art discloses the solution, there is no long-felt unmet need. *Newell Companies v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988). Here, Godoy, Tobler, and Oliveira can all be considered as disclosing the solution. Each illustrates that the combinations of an SDHI (such as benzovindiflupyr), mancozeb, and a QOI and/or DMI, are effective at controlling soybean rust. EX1005, Table 5; EX1003. Indeed, Jacobsen admitted the unresolved need for the “improved control of Asian soybean rust” was already solved. EX1045, 292:12-293:5; EX1007, 25. Accordingly, UPL’s arguments regarding long-felt need fail as a matter of law.

UPL’s reliance on Syngenta marketing material as evidence that its claimed combinations met the need for “improved control of Asian soybean rust” is meritless. POR, 70-71. The marketing materials provide no nexus to the claimed combinations as they do not: (i) promote any fungicidal combination encompassed

by the '727 patent claims, or (ii) attribute any claimed fungicidal combination as solving a long-felt need. *Volvo Penta of the Ams. LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023) (a nexus must exist between the merits of the claimed invention and the objective evidence for it to be relevant). Rather, the marketing materials promote “Mitrion™.” EX2038. Mitrion™, however, is a premix of prothioconazole and benzovindiflupyr (EX2038, 12-13), which is not encompassed by the '727 patent claims since it does not include mancozeb.

In the “General Application” section it “Recommends” Mitrion™ should be applied in combination with a multisite (Bravonil (chlorothalonil) or Mancozeb) (EX2038, 14), however, it does not promote the combination of Mitrion™ exclusively with mancozeb. Therefore, any combination of Mitrion™ with mancozeb lacks a nexus to the merits of the '727 patent claims.

B. Unexpected Results—Fundamentally Flawed

As a preliminary matter, UPL has withdrawn any substantive reliance on the experiments in the '727 patent to support unexpected results. Paper 39, 3. Rather, UPL attempts to reanalyze the data from Petitioner’s investigation of the purported synergy of the fungicidal combinations claimed in the '727 patent. However, when questioned about his manipulation of Petitioner’s data, UPL’s expert acknowledged numerous fundamental errors in his analysis. It is apparent that both the methods and conclusions are unreliable and should be dismissed in their

entirety.

1. UPL's Unsupported Synergy Threshold

For instance, when calculating “synergy,” UPL contends it is necessary to lower the “Expected Action” of the combination by 20%, *i.e.*, reducing the Colby ratio from 1 to 0.8. However, as admitted by UPL's expert, there is no basis for such a change:

Q. So do you cite in your declaration to any references that support using Colby when there are overlapping modes of action and choosing a ratio less than 1 to apply?

A. In the examples where I took Syngenta's data that was given to me and using the Colby formula, I felt there was synergy and I so state – I said conservatively a Colby ratio of .9 or above I considered to be synergy because we do have overlapping modes of action and that's just an educated guess based on my life experiences and working with many of these same fungicides.

Q. Okay. And you don't cite to any references to support that, correct?

A. I don't believe there are any specific references that say that.

EX1043, 192:1-18.

Yet, when it serves UPL, UPL takes the opposite position. As illustrated by the below excerpt from EX1034, UPL represented ratios of 0.9 were “antagonistic”

during prosecution of Oliveira in Europe:

Spray No.	Product	Percentage Disease incidence	Percentage Control	Colby predicted Control
1	Untreated check	93.8	0.0	
2	Unizeb Gold Strides	81.3	13.3	-
3	Oranis Strides	70.8	24.4	-
4	Tebufort Strides	79.2	15.6	-
5	Unizeb gold Oranis Strides	64.6	31.1	34.5 (Antagonistic)
6	Unizeb gold Tebufort Strides	72.9	22.2	26.8 (Antagonistic)
7	Oranis Tebufort Strides	68.8	26.7	36.2 (Antagonistic)
8	Unizeb gold Oranis Tebufort Strides	43.8	53.3	44.7 (Synergistic)

colby ratio

0.90
0.83
0.74
1.19

EX1034, 13 (annotated by Jacobsen). In fact, UPL has taken the position that even a Colby ratio of 0.99 is antagonistic. EX1043, 221:3-222:5; EX1038, 70.

2. UPL's Expert Admitted Multiple Errors in His Analysis

Finally, Jacobsen has admitted that his analysis, as reflected in the Appendix B tables to his declaration, are riddled with errors. The errors are so numerous and fundamental it is impractical to address each one; they are in the numbers and formulas used. Nevertheless, for the purposes of illustration, Petitioner highlights the following testimony from the deposition of Jacobsen:

Q. Okay. Were those numbers calculated correctly?

We'll get to page 25 in a minute here.

A. A8 -- I'm going to be very honest with you, I'm confused right now. Continue. I'm confused right now.

...

Q. Okay. And the values for A9 on page 24 should also be identical to the values for A9 on page 25?

A. I would think so, yes.

Q. But they're not identical, are they?

A. I'm trying to figure out why. Okay.

....

Q. But the value you've entered for A8, are 4 on page 25 is not 46.7, is it?

A. No. There's something wrong with the equation as it's represented. You have to go into the Colby formula. There's something wrong here with this equation that's presented.

...

A. I believe what is wrong with this is we would have taken -- in calculating ... So the equation that's demonstrated here on page 25 is not correct.

...

A. But to come up with the observed for the com- -- okay. There's something wrong with this equation. Just in my mental state at this moment I can't tell you what it is.

...

A. And then 20 -- A9 -- I can't explain to you why these two tables are different.

EX1043, 261:21-262:3, 264:4-10, 265:13-18, 266:7-13, 266:21-267:2, 268:22-269:1; *see also id.* at 269:13-270:13 (admitting that multiple entries in the defoliation table at page 25 of Appendix are incorrect). Ultimately, with respect to his defoliation analysis, Jacobsen admitted that his summary table at page 93 of his declaration included numerous errors, which he could not exhaustively identify without redoing his calculations. *Id.* at 277:277:6-278:14.

With respect to his yield analysis, Jacobsen, again, admitted that his methodology has no scientific basis. Jacobsen admitted he was not aware of any scientific literature that determined synergy based on yield and he never performed such an analysis except for this proceeding. EX1043, 278:17-279:2.

Additionally, Jacobsen admitted that his yield analysis, like his defoliation analysis, was riddled with errors. For example, he acknowledged that the calculated “expected” values using the Colby equation should be **higher** than the “observed” values for the individual fungicides. EX1043, 184:11-185:10, 290:13-291:3. Yet, as Jacobsen admitted, his calculated “expected” Colby values for yield were **lower** than the “observed” values for the individual fungicides. *Id.* at 291:4-15. When shown this error, Jacobsen admitted the yield data was wrong. *Id.* at 291:19-20. Jacobsen also was unable to identify which Colby formula he used in his yield analysis. *Id.* at 287:16-288:2. These admitted errors in Jacobsen’s analysis, which he was unable to explain or correct, render his opinions regarding

synergy entirely unreliable.

VIII. CONCLUSION

For the reasons stated herein, and in the Petition, Petitioner respectfully requests that the Board find claims 1-10 of the '727 patent invalid.

Date: February 9, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I hereby certify that on February 9, 2024, a copy of the foregoing PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE was provided via email to the following:

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CERTIFICATE OF COMPLIANCE

I hereby certify that this brief complies with the type-volume limitations of 37 C.F.R. § 42.24(c)(1), because it contains 5,312 words as determined by the Microsoft® Word word-processing system used to prepare the brief, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(c). This reply complies with the general format required of 37 C.F.R. § 42.6(a).

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