UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYNGENTA CROP PROTECTION AG,
Petitioner

v.

UPL LTD.,
Patent Owner.

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

PATENT OWNER'S RESPONSE

PUBLIC VERSION

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I. INTRODUCTION

The challenged claims of U.S. Patent No. 11,445,727 ("'727 patent") recite novel and inventive mixed fungicidal combinations and compositions consisting of benzovindiflupyr, mancozeb, and at least one of an ergosterol biosynthesis inhibitor ("EBI") and/or a quinone outside inhibitor ("QoI"). Although Petitioner asserts multiple grounds of anticipation and obviousness and further asserts grounds based on written description and enablement, Petitioner failed to establish by a preponderance of the evidence that any claim of the '727 patent is unpatentable under any ground.

The Institution Decision (Paper 8, "ID") only found Ground 2 based on Tobler (EX1006) to meet the institution threshold. ID, 7. Not addressed in the Preliminary Response and thus not considered in the ID was, *inter alia*, Petitioner's failure to establish that Tobler teaches or suggests the claimed mixed "combination" or "composition" where (1) Tobler defines "composition" to cover a genus that includes sequential (non-mixed) applications and (2) Tobler's genus of 250+ tertiary compounds are not necessarily compatible for mixture with benzovindiflupyr and/or mancozeb. Also not considered was Petitioner's failure to establish that a person of ordinary skill ("POSA") would have envisaged a mixed "combination" or "composition" as claimed among even this smallest possible Tobler genus that would cover over 3,000 potential—but undisclosed—species. To the contrary,

cross-examination of Petitioner's declarant, Dr. Brannen, demonstrates that even he could not navigate Tobler's disclosure without a color-coded roadmap prepared by counsel.

Compounding the failure of proof for Tobler, Petitioner failed to address the "consisting of" limitation found in all challenged claims. Instead, Petitioner and its declarant described Tobler as being open to at least a fourth component which would include components with modes of action excluded from the closed format claims. In fact, all of Petitioner's prior art grounds are defective for not addressing the "consisting of" limitation.

Also not considered at institution was the data—recently produced by Petitioner as ordered by the Board—underlying the fungicide field trials conducted by Petitioner and its declarant Dr. Prates. As explained by Patent Owner's declarant, Dr. Barry Jacobsen, Petitioner's field trial data demonstrates that [redacted]. Most importantly, "Colby" synergy was found for [redacted]. Further, relevant to the admission of Dr. Prates that "[i]t's really hard to find a combination that delivers more than 80 percent of control" (EX2018, 87:12-17), his data shows that [redacted]. EX1031, 3, 4, 5, 10.

Especially when considered together with Petitioner's marketing and promotion of a claimed combination to meet a long felt need for the control of Asian soybean rust, this objective evidence is particularly compelling.

Between Petitioner's failures of proof for all grounds, conclusory arguments (such as for motivation to combine), misapprehension of the standards (such as for written description and enablement), and extensive objective evidence of non-obviousness (such as synergistic yield) generated by Petitioner, Petitioner has failed to establish that any claim is unpatentable under any of its multiplicity of grounds.

II. THE '727 PATENT

A. Challenged Claims

Claims 1-10 of the '727 patent, of which claims 1, 5, and 10 are independent, are directed to fungicidal combinations (claims 1-4, 7) and compositions (5, 6, 8) consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from specified ergosterol biosynthesis inhibitors ("EBI") and/or specified quinone outside inhibitor ("QoI") and related methods of use (claims 9-10). EX1001, *e.g.,* claim 1; EX2020, ¶¶53-61. Claim 1 is representative of independent claims 5 and 10 and arguments made herein apply equally to each, unless noted otherwise. The dependent claims add limitations directed to inclusion of both EBI and QoI fungicides (claim 2), specific fungicides (claims 3-4), formulation types and component amounts (claims 5-8), and application methods (claim 9).

B. Specification

As described by the ’727 patent, SDHI fungicides such as benzovindiflupyr and multi-site fungicides such as mancozeb were well-characterized and known by POSAs. EX1001, 1:50-60, 3:6-8; EX2020, ¶¶41-43. But there remained “a need in the art for combinations of SDHIs with a specific fungicide that helps improve” the spectrum of fungicidal activity. EX1001, 1:65-67; *see also* EX2020, ¶¶44.

The ’727 patent provided “surprising and unexpected advantages,” including “an enhancement of the efficacy and a surprising reduction in fungal disease incidence” by teaching exemplary combinations and formulations of benzovindiflupyr, mancozeb, and another fungicide, including from specifically identified EBIs or QoIs. EX1001, 3:15-25; EX2020, ¶¶45-52.

C. Effective Filing Data

Claims 1-10 of the ’727 patent are entitled to the priority date of IN 201631037704 (“IN ’704”), filed November 4, 2016. IN ’704 describes and enables the use of the fungicidal combinations and compositions claimed in the ’727 patent. *E.g.,* EX1002, 351-53 (disclosing combinations of benzovindiflupyr and mancozeb in combination with EBIs and/or quinone outside inhibitors), 347-48 (listing ergosterol biosynthesis inhibitors and QoIs for use in the disclosed combinations and compositions). EX2020, ¶¶62-67; Petitioner did not challenge the November 4,

2016, effective filing date. Pet., 15-16 ("The effective filing date of all challenged claims 1-10 is no earlier than November 4, 2016.").

D. Level of Skill in the Art

Patent Owner does not contest Petitioner's proposed definition of a person of ordinary skill in the art ("POSA") (Pet., 18) for the purposes of this proceeding, except the need for one modification: a POSA would also have been familiar with pesticide label development and/or registration and would have had experience in making pest management recommendations to growers. EX2020, ¶¶1, 13-40, 68-69; *see also* EX1003, ¶¶105-107 (citing Elatus® label, EX1009); EX2021, 31:7-14.

III. CLAIM CONSTRUCTION

A. "*fungicidal combination*" (claims 1, 2, and 5) and "*combination*" (claims 3, 4, 6, 7, 9, and 10) and "*composition*" (claims 5, 6, and 8)

Each claim refers to a "*fungicidal combination,*" "*combination,*" or "*composition.*" These terms should be construed consistent to mean that the recited fungicides are together in a single mixture (e.g., as a pre-mix or tank-mix), distinct from applying one or more of them sequentially.[1] EX2020, ¶¶29, 70-72; EX1001, 19:54-60 (defining composition). This is consistent with how a POSA would understand the terms in the art, generally. EX2020, ¶¶73-77 (citing EX2027,

[1] To the extent the Board does not adopt this construction of "combination," the term "composition" as used claims 5, 6, and 8 would still be understood as "mixed."

EX2028, EX2036); EX2021 82:6-83:22; EX1006, 27:55-64 (defining composition). *See also PIN/NIP, Inc. v. Platte Chemical Co.*, 304 F.3d 1235, 1244 (Fed. Cir. 2002) ("The term 'composition' in chemistry is well-established. It generally refers to mixtures of substances," and the terms "composition," "mixture," "combination," and "conjunction… all mean essentially the same thing.").

This is also consistent with the use of "combination" in the '727 patent, which states that "[t]he combinations of the present invention may be sold as a pre-mix composition or a kit of parts such that individual actives may be mixed before spraying," where "the kit of parts may contain succinate dehydrogenase inhibitor fungicide and the dithiocarbamate fungicide pre-mixed and the third active may be admixed with an adjuvant such that the two components may be tank mixed before spraying." EX1001, 19:54-60. And the '727 patent further equates combinations with fungicides "mixed with" one another. EX1001, 21:15-21 ("It was thus found that the incorporation of mancozeb greatly increased efficacy and disease control of the succinate dehydrogenase inhibitor fungicide treatments when ***mixed with*** [EBIs] or [QoIs]. It was thus concluded that the addition of mancozeb enhanced the efficacy of the combination and surp[ri]singly gave a synergistic effect.").[2]

[2] All ***bold italic*** emphasis added.

Petitioner appears to agree that all claim terms should be afforded their plain and ordinary meaning and that in the context of the ’727 patent, the “combination” requires a combination of fungicides in a single mixture. Pet., 18 (“the claims include the term composition or combination which are used interchangeably in the specification”) (citing EX1003, ¶76).

For clarity, while the ’727 patent uses both “composition” and “combination” to refer to fungicides combined in a single mixture, it does not use these terms interchangeably. EX2020, ¶¶78-81. For example, the claimed “combination[s]” comprises the recited fungicides, while the claimed “composition[s]” necessarily further include “at least one agrochemically acceptable excipient.” *E.g.*, EX1001, claims 1, 5. This is consistent with how the terms are used in the specification. *Id.*, 15:26-48 (“The combinations of the present invention may be formulated in the form of a composition” comprising fungicides and “at least one agrochemically acceptable excipient.”), 15:58-67 (“[I]n an embodiment, the present invention may provide compositions comprising [fungicides that are] combined in agrochemically acceptable amounts.”), 16:23-27 (“In an embodiment, the compositions of the present invention may typically be produce[d] by mixing the actives in the composition with an inert carrier, and adding surfactants and other adjuvants and carriers as needed and formulated into solid, or liquid formulations....”).

B. "*consisting of*" (claims 1, 2, 5, and 10)

"*Consisting of*" should be construed according to its legal meaning that the claimed combinations include the recited fungicide components and no other fungicides (*contra* "*comprising*"). EX2020, ¶¶82-83; *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1331 (Fed. Cir. 2004) ("'consisting of' is a term of patent convention meaning that the claimed invention contains only what is expressly set forth in the claim… [however]… it does not limit aspects unrelated to the invention"). Petitioner does not address substantively this limitation or its construction.

IV. GODOY DOES NOT ANTICIPATE ANY CLAIM OF THE '727 PATENT [GROUND 1]

In the Institution Decision, the Board recognized Patent Owner's preliminary arguments that Petitioner failed to show that Godoy (i) is prior art, (ii) discloses a "combination" of claimed components, and (iii) discloses any treatment "consisting of" the claimed fungicides. As the Board acknowledged, "Patent Owner's arguments are not unreasonable, [but] they involve fact intensive issues." ID, 18. Patent Owner has further developed these issues below, further demonstrating that Petitioner failed to establish that Godoy anticipates any of claims 1, 3-5, 7, 9, or 10. EX2020, ¶¶5-6, 30-33.

A. Petitioner Failed to Establish That Godoy Is Prior Art

The Petition asserts that "Godoy published September 1, 2016, before the filing date of the '727 Patent." Pet., 1 (citing EX1019, ¶47), 18 ("published

September 1, 2016"); EX2020, ¶¶84-87. However, it provides no argument or evidence to meet its "burden of establishing by a preponderance of the evidence that a particular document is a printed publication." *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 11 (PTAB Dec. 20, 2019) (precedential); *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018) (citing *Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1380 (Fed. Cir. 2018)); *see also In re Wyer*, 655 F.2d 221, 227 (C.C.P.A. 1981) (a party asserting a reference as a prior art printed publication should provide sufficient proof of accessibility).

Godoy is a Portuguese-language reference said to be from a "Technical Circular" and apparently recently downloaded from the website of Embrapa, the "Brazilian Agricultural Research Corporation." *See* EX1004; EX1005. The Petition does not assert (much less establish) that Godoy is from an established publisher and bears copyright, printing, or ISBN dates. *Cf. Hulu,* IPR2018-01039, Paper 29 at 19-20. Instead, the Petition asserts no more than that "Godoy published September 1, 2016, before the filing date of the '727 Patent." Pet., 1 (citing EX1019, ¶47), 18 ("published September 1, 2016"). The cited support from the declaration of Dr. Hall-Ellis, however, *at most* addresses the authenticity of EX1004 "downloaded from the Embrapa website" and its translation (EX1005). EX1019, ¶47. It in no way

supports—much less establishes—Godoy's publication date or that it was publicly accessible before the critical date.

The Petition does not cite to any testimony of Dr. Hall-Ellis beyond EX1019, ¶47. Even if the Petition had *cited* additional declaration testimony, it made no arguments beyond that "Godoy published September 1, 2016, before the filing date of the '727 Patent" (Pet., 1) and Rule "42.6(a)(3) prohibits incorporating arguments by reference from one document into another." 2019 Trial Practice Guide, 35-36; *Cisco Systems, Inc. v. C-Cation Techs., LLC*, IPR2014-00454. Paper 12 at 10 (PTAB Aug. 29, 2014) ("It is improper to incorporate by reference arguments from one document into another document.") (informative); *3M Co. v. Evergreen Adhesives, Inc*., 860 F. App'x. 724, 725-728 (Fed. Cir. 2021) (upholding the PTAB rule against incorporation). And even if additional arguments of Dr. Hall-Ellis—specifically her "opinion that Godoy report was available to the public on September 1, 2016" (EX1019, ¶49)—are considered, they too fail to establish that Godoy was publicly available and accessible in the prior art. EX2020, ¶¶84-90.

Dr. Hall-Ellis's opinion is based solely on (1) the purported "publication date" listed separately on the Embrapa website and (2) her ability to locate Godoy "by entering its title" in an internet search engine. EX1019, ¶¶47-49. Neither alleged fact is sufficient here. Notably, the Board has previously rejected even more detailed publication date testimony from Dr. Hall-Ellis as unfounded "speculation." *Unified*

Patents Inc. v. American GNC Corp., IPR2019-00505, Paper 31 at 14-16 (PTAB July 19, 2019) (finding Dr. Hall-Ellis's publication date testimony "would be speculation" and holding Petitioner failed to establish the asserted reference constituted prior art). That Petitioner relies on Dr. Hall-Ellis to repeat discredited opinion testimony is equally problematic and unfounded.

First, Dr. Hall-Ellis has no basis to speak to any "publication date" on the Embrapa website obtained by "[c]licking on the 'Further Information' tab." EX1019, ¶47. Dr. Hall-Ellis is not the custodian of the Embrapa website. Nor does she purport to have personal knowledge of or otherwise have familiarity with Embrapa, its practice in publishing "Technical Circulars," or the meaning, accuracy, or relevance of dates as currently stated on the "Further Information" tab of its website. *Id.*, ¶¶47-49. For example, even if "published" on some date by Embrapa—an agricultural research organization and not an established publisher (EX2020, ¶90)—it is unknown from the testimony of Dr. Hall-Elis to whom it was published and whether anything published was identical to EX1004. *See B/E Aerospace, Inc. v. C & D Zodiac, Inc.*, 709 F. App'x. 687, 697-698 (Fed. Cir. 2017) (affirming Board's finding that a reference was not shown to have been disseminated where the sponsoring declarant lacked "personal knowledge regarding whether the Orange Book version in evidence was published and distributed during the relevant time period").

In short, she has no apparent basis to opine on the accuracy of information on the Embrapa website, including the meaning of accuracy of the purported publication date that she relies on in her declaration. She is an employee of an unrelated university whose similar unsupported declaration testimony on prior art status has been repeatedly found not credible. EX1019, ¶7; *Salesforce.Com, Inc. v. WSOU Investments, LLC*, IPR2022-00428, Paper 10 at 12-15 (PTAB July 13, 2022); *Unified Patents*, IPR2019-00505, Paper 31 at 14-16.

Moreover, contrary to Dr. Hall-Ellis's assertions, the Embrapa website page attached to her declaration does not provide "a ***publication date*** of September 1, 2016." *Compare* EX1019, ¶47 *with id.*, 134-35 (Attachment 1b), ¶89. Rather, the only "publication" information is the bare "[y]ear of publication: 2016" with no associated month or day. EX1019, 134-135 (Attachment 1b). The "current date" of September 1, 2016, is not identified as a "publication" date and is of questionable meaning where Attachment 1b also bears a date of "1/23/23" in its header. *Id*. As such, even taking the information in Exhibit 1019, Attachment 1b at face value, the Embrapa website at most identifies the publication year as "2016." Precision matters here. If Godoy were first publicly available after November 4, 2016, it is not prior

art to the ’727 patent, which claims priority to an application filed November 4, 2016.[3] *See* EX1001, 1; *supra* section II.C.

Second, Dr. Hall-Ellis has not established that Godoy was publicly accessible in the prior art. *See* EX1019, ¶47; EX2020, ¶¶88-90. Searching the internet for Godoy’s ***title***—as Dr. Hall-Ellis did[4]—does not establish that Godoy could have been located by a skilled artisan exercising reasonable diligence, e.g., a person searching by topic without Dr. Hall-Ellis’s prior knowledge of Godoy’s title. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1349 (Fed. Cir. 2016) (“Indexing only by title and author’s name did not amount to the references being either cataloged or indexed in a meaningful way.” (citation and internal quotation omitted)); *Samsung Elecs. Co., Ltd. v. Infobridge Pte. Ltd.,* 929 F.3d 1363, 1372

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[3] Although not argued as evidence of Godoy public accessibility, the Petition elsewhere cites a statement (EX1021, ¶38) that “in 2016, for the first time, studies were published” followed by citation to Godoy. Pet., 12. However, “in 2016” is not prior to the ’727 patent’s November 4, 2016, effective filing data. Moreover, EX1021, dated from June 2019, does not purport to provide personal knowledge regarding Godoy’s publication date.

[4] EX1019, ¶47 (“The Godoy report can be found by entering its title in an Internet search engine.”).

(Fed. Cir. 2019) ("Taken together, these cases suggest that a work is not publicly accessible if the only people who know how to find it are the ones who created it."); EX2020, ¶90. Once again, the Board has rejected analogous testimony from Dr. Hall-Ellis for this reason. *Salesforce.Com*, IPR2022-00428, Paper 10 at 12-15 (finding Dr. Hall-Ellis "does not identify any evidence to support her understanding as to how the Code Project website would have been searched [by a POSA] before the critical date").

The timing here is also problematic. Dr. Hall-Ellis presumably conducted her search years after the priority date at the request of counsel for Petitioner in connection with this matter. *E.g.*, EX1019, 133-34 (Attachment 1b) (showing header date of 1/23/23). Neither her years-later search for the title of Godoy nor a purported 2016 "publication" date can establish indexing or public accessibility *as of the critical date. See Blue Calypso*, 815 F.3d at 1349-50 ("The record is devoid of any evidence that a query of a search engine before the critical date, using any combination of search words, would have led to Ratsimor appearing in the search results."). EX2020, ¶90.

In short, Dr. Hall-Ellis provides no evidence that Godoy was indexed, searchable, or otherwise disseminated prior to November 4, 2016 (the priority date of the '727 patent). Her "opinion" on Godoy is no more than unsupported speculation and is entitled to no weight. *See Topcon Med. Sys., Inc. v. Carl Zeiss*

Meditec, Inc., IPR2021-00452, Paper 14 at 18-20 (PTAB July 21, 2021) (finding a journal manager's conclusory and unsupported declaration on an article's publication date to be insufficient); *Mylan Pharm. Inc. v. Boehringer Ingelheim Int'l Gmbh*, IPR2016-01565, Paper 23 at 8 (PTAB Aug. 1, 2017) (dismissing a declarant's publication date testimony because "Petitioner does not point to any evidence—nor can we discern any in [the] Declaration—that would reasonably suggest that [the declarant] has personal knowledge as to when and how [the reference] was made available to the public.").

B. Petitioner Failed to Establish Godoy Discloses a Claimed "*Combination*" or "*Composition*"

As addressed in §III.A *supra*, the claimed fungicide components are provided in mixed combination or composition, distinct from sequential application. EX2020, ¶¶70-77 (citing EX2036). While Petitioner argues that "the ***combination*** of benzovindiflupyr + mancozeb + azoxystrobin has already been disclosed in Godoy" (Pet., 19-20), what Godoy actually teaches is "***associated*** treatments," "applications ***associated***," ***"association[s]*** with," and "***associated*** application[s]." EX1005, 4-6. Godoy cannot anticipate any claim of the '727 patent as it does not describe or otherwise disclose *mixed* combinations or compositions, as claimed. EX2020, ¶¶91-114; *PIN/NIP*, 304 F.3d at 1245-46 (finding reference did not "constitute clear and convincing evidence that supports a finding of anticipation" of claims to a combination because it was "silent regarding the relative timing of the applications"

required by claims); *see also Pozen Inc. v. Par Pharm., Inc.*, 696 F.3d 1151, 1165, (Fed. Cir. 2012) (claims directed to multilayer drug tablet using two known drugs were not obvious where the prior art only showed sequential application of the two drugs, not a combination).

The Petition, in fact, failed to address Godoy's express reference to "associated" treatments beyond reproducing Godoy Table 3 (Pet., 20 ("associated treatments") and restating Godoy disclosure regarding "applications associated" in a claim chart without discussion (*id*. at 23-24, 26). Having ignored the disclosure of Godoy, Petitioner failed to meet its burden and is precluded from later "submit[ing] new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability." 2019 Trial Practice Guide, 73; *see also Wasica Fin. GmbH v. Contl. Auto. Sys., Inc.*, 853 F.3d 1272, 1285 (Fed. Cir. 2017) (argument waived where the petition did "not advance a separate argument on [the] ground").

While Patent Owner does not bear a burden to establish that "associated treatments" in the context of Godoy are distinct from mixed combinations and compositions as claimed, the evidence nevertheless shows that they are—and would have been understood as—distinct. EX2020, ¶¶93-99, 101-103. Specifically, a POSA would understand Godoy's "associated treatments" to describe multiple

fungicides applied *sequentially*—not as mixed combinations or compositions—to the same crop at different times. EX2020, ¶100.

First, Godoy Table 3 indicates that "associated treatments" means *sequential* application. EX2020, ¶94-98, 102. Petitioner points to Table 3 in Godoy (Pet., 20), which discloses "azoxystrobin + benzovindiflupyr" separately from mancozeb in the "Active ingredient (a.i.)" column and identifies separate "Commercial products (C.P.)" as Elatus®[5] and Unizeb Gold®, and Elatus® and PNR (product not registered) (EX1005, 4 (Table 3, treatments 17 and 23)). Reinforcing that they are *separately* applied, Godoy Table 1 footnote 1 (reproduced below) indicates that "Nimbus" was added to "azoxystrobin + benzovindiflupyr" (Elatus) *but not* to mancozeb.

17	azoxystrobin + benzovindiflupyr[1] and mancozeb	60+30 and 1500	Elatus® and Unizeb Gold®
23	azoxystrobin + benzovindiflupyr[1] and mancozeb	60+30 and 2000	Elatus® and PNR[2]

[1] Added Nimbus 0,6 L ha-1; [2] PNR – Product not registered for the soybean crop, RET III.

(Table 3, treatment 17 and 23, footnote 1 (highlights added). Consistent with preferred and ordinary practice of sequential applications, a POSA would also understand, based on Godoy's experimental design, that sequential applications were more efficient and therefore the preferred method. EX1005, 4; EX2020, ¶¶3

[5] EX2021, 30:13-31:5 (does not see "any indication… of what other ingredients comprise the 55 percent of Elatus").

(citing EX2032, EX2033), 100-101; EX2021, 12:8-13:7, 14:14-16:3, 16:22-18:7, 21:9-23:8.

Second, the use of the term "associated treatments" in other references shows it connotes multiple *sequential* applications of fungicides. EX2020, ¶¶104-111. For instance, EX2002 (de Souza) describes an "***association*** of protective and systemic fungicides" (EX2002, Abstract) where the two fungicides are applied separately: one (protective) in the morning and the other (systemic) in the afternoon. (EX2002, 3-4); EX2020, ¶¶105-108. Applying the "associate[ed]" fungicides at different times of day necessarily means they were *not* mixed together. EX2020, ¶108. EX2002 (de Souza) further explains "[m]ixtures of triazoles and strobilurins [(*e.g.*, azoxystrobin)] are commonly used in soybean crops to managed Asian rust; thus, the addition of a protective fungicide [*e.g.*, mancozeb] ***alone*** would result in more efficient control of leaf spot." EX2002, 4. The use of mancozeb "***alone***" is consistent with Godoy treatments 17 and 23, directed to treatment using mixtures of azoxystrobin + benzovindiflupyr (Elatus) and Nimbus, followed sequentially by mancozeb alone. EX2020, ¶107.

Further evidencing that "associated" refers to separate applications, EX2040/2041 (Reis) describes the "impact of glyphosate ***associated*** with insecticide and fungicide." (EX2040/2041, 1). There, Reis directs the that the soil is first "chemically desiccated with glyphosate" then separately for planting "seeds []

treated with" insecticide and fungicide (carbendazim + thiram). EX2040/2041, 3. Thus, Reis necessarily uses "associated" treatments to mean the separate application of compounds. EX2020, ¶¶109-111.

Even were Petitioner to have argued that "associated" means a mixed combination or composition (which it did not), in view of the evidence above that would, at best, render Godoy ambiguous as to whether the components are applied sequentially (as the reference and its "associated" terminology suggest) or in a mixed combination. EX2020, ¶¶112-114. Godoy's—at best—ambiguous disclosure would fail to anticipate the claimed fungicidal "combinations" as a matter of law. *Wasica Fin.*, 853 F.3d at 1284 ("[I]t has long been understood that ambiguous references do not, as a matter of law, anticipate a claim."); *see also Lutron Elecs. Co. v. Geigtech E. Bay LLC*, PGR2020-00012, Paper 20 at 24-26 (PTAB Aug. 4, 2020) (ambiguous references insufficient for anticipation); *Hong Kong Ucloudlink Network Tech. Ltd. v. Simo Holdings Inc.*, IPR2019-00857, Paper 15 at 13, 20-22 (PTAB Sept. 17, 2019) (same); *Polycom, Inc. v. Fullview, Inc.*, IPR2019-00647, Paper 12 at 12-14 (PTAB July 10, 2019) (same); *Ex Parte Huchel*, Appeal No. 2016-007661 at 2 (PTAB June 7, 2017) (same).

C. Petitioner Failed to Establish That Godoy Meets the "Consisting Of" Limitation

Every Godoy two- and three-component associated treatment relied upon by Petitioner includes "Nimbus" added to the Elatus® (benzovindiflupyr +

azoxystrobin) product. Godoy Table 3 (reproduced below); Pet., 20 (citing EX1005, 3); EX2020, ¶¶115-116, 132. Fatal to the ground, Petitioner failed to even address whether Godoy meets the claimed "consisting of" limitation at all much less in view of the added Nimbus. EX2020, ¶118. *Xilinx, Inc. v. Analog Devices, Inc.*, IPR2020-01559, Paper 31 at 42 (PTAB Mar. 11, 2022) ("Petitioner waived this argument because it was not presented in the Petition.").

Table 3. Active ingredients (a.i.), commercial product (C.P.) and dose of fungicides evaluated in associated treatments to control diseases in soybean crops, 2015/16 harvest.

	Active ingredient (a.i.)			
1	control			
2	picoxystrobin + cyproconazo			
3	picoxystrobin + cyproconazo			
4	picoxystrobin + cyproconazo			
5	picoxystrobin + cyproconazo			
6	picoxystrobin + cyproconazo			
7	picoxystrobin + cyproconazo			
8	picoxystrobin + cyproconazo			
9	picoxystrobin + cyproconazo			
10	picoxystrobin + cyproconazo			
11	picoxystrobin + cyproconazo			
12	picoxystrobin + cyproconazo			
13	azoxystrobin + benzovindiflu			
14	azoxystrobin + benzovindiflu			
15	azoxystrobin + benzovindiflu			
16	azoxystrobin + benzovindiflupyr[1] and copper oxychloride	60+30 and 200	Elatus[4] and PNR[2]	0.2 and 0.4
17	azoxystrobin + benzovindiflupyr[1] and mancozeb	60+30 and 1500	Elatus[4] and Unizeb Gold[6]	0.2 and 2.0
18	azoxystrobin + benzovindiflupyr[1] and copper sulfate	60+30 and 113,85	Elatus[4] and PNR[2]	0.2 and 0.75
19	azoxystrobin + benzovindiflupir[1] and propineb	60+30 and 1400	Elatus[4] and PNR[2]	0.2 and 2.0
20	azoxystrobin + benzovindiflupyr[1] and fluazinam	60+30 and 500	Elatus[4] and Frowncide[8]/Zignal[9]	0.2 and 1.0
21	azoxystrobin + benzovindiflupyr[1] and chlorothalonil	60+30 and 1000	Elatus[4] and Bravonil 500[6]	0.2 and 2.0
22	azoxystrobin + benzovindiflupyr[1] and chlorothalonil	60+30 and 1000	Elatus[4] and PNR[2]	0.2 and 2.0
23	azoxystrobin + benzovindiflupyr[1] and mancozeb	60+30 and 2000	Elatus[4] and PNR[2]	0.2 and 2.5

[1] Added Nimbus 0,6 L ha-1; [2] PNR – Product not registered for the soybean crop, RET III.

EX1005, 3 (color added).

Beyond noting the addition of "Nimbus" to Elatus®, Godoy does not otherwise describe the component. EX2020, ¶117. A POSA would, however, have understood that "Nimbus" is the proprietary name of multiple commercial fungicidal products, in particular mineral oil and sulfur products. EX2020, ¶¶119-120; EX2021, 110:4-

11 (sulfur is a fungicide); EX2003 ("Nimbus WG Fungicide/Miticide"); EX2004 (registration information for Nimbus WG Fungicide/Miticide, EX2003); EX2005 ("Nimbus" fungicide); EX2006 (translation of EX2005); EX2007 (registration page for the Nimbus product of EX2005); EX2008 (translation of EX2007); EX2009 ("Nimbus" fungicide); EX2010 (translation of EX2009). Both are fungicidally active at the levels used in Godoy and both are excluded from claims based on the "consisting of" limitation. EX2020, ¶¶121-131 (citing EX022, EX2023, EX2039, EX2042, EX2043, EX2044, EX2045, EX2059).

While Petitioner's declarant links Nimbus to a mineral oil product (EX1003, 41 n.3)), the Petition makes no such argument. 37 C.F.R. § 42.6(a)(3); *3M*, 860 F. App'x. at 728. It is also inconsistent with the label for the Elatus® product used in Godoy, which directs *against* using mineral oil. EX1009 (Elatus label), 17; EX2021, 31:7-14 (agreeing "a person of ordinary skill in the art would have relied upon" the label), 42:12-17 (Elatus discourages the use with mineral oil), 45:19-46:12; EX2020, ¶¶123-124. And, assuming, *arguendo*, that the Petition had argued that Godoy's "Nimbus" is mineral oil and that mineral oil is not a fungicide, Godoy would remain at best ambiguous as to which Nimbus (sulfur or mineral oil) was employed. Such "ambiguous references do not, as a matter of law, anticipate a claim." *Wasica Fin.*, 853 F.3d at 1284 (Fed. Cir. 2017).

Thus, as every relied-upon Godoy associated treatment incorporates "Nimbus," Petitioner failed to establish that Godoy anticipates any claim.

V. TOBLER NEITHER ANTICIPATES NOR RENDERS OBVIOUS ANY CLAIM [GROUND 2]

Petitioner does not establish that a POSA would have envisaged or found obvious from Tobler (EX1006) the mixed combinations or compositions of claims 1-10. EX2020, ¶¶7-8, 34-36, 133-138.

Tobler is Petitioner's patent focused on two-component fungicides comprising a component (A) from a specified chemical genus and a component (B) from a laundry list of secondary compounds. *E.g.,* EX1006, 12:20-23, 13:38-14:16, 29:51-31:20, 34:33-51. Its biological data is likewise limited to two-component fungicides, which are reported to routinely achieve 100% control without the need for any additional components. *Id.* at 41:45-61:17; EX2020, ¶136. By contrast, Tobler at most describes broad genera of three or more components. It does not describe any specific three or more component mixed combinations much less any as arranged in the challenged claims. To generate three component species, a POSA would have to be guided through this vast number of undisclosed combinations within unduly broad genera. EX2020, ¶¶135-138.

Among the maze of genera through which a POSA would have to navigate, Tobler's non-preferred embodiments include a genus of "compositions" of compounds A-1.1 (benzovindiflupyr) and A-1.2 with multiple (B) components,

including at least one "group P" component. EX1006, 22:61-25:67; EX2020, ¶¶139-147. The "compositions" in turn are, based on Tobler's non-standard definition thereof, corresponding to a genus of 13 different permutations of mixtures and sequential applications for three components. EX2020, ¶¶148-150; EX2016; EX2021, 88:10-89:12. Considering only three-component benzovindiflupyr combinations, the Tobler genera would encompass over 390,000 potential but undisclosed species. EX2020, ¶¶151-152.

Petitioner's unpatentability arguments are not premised on any fair reading of what a POSA would envisage or find obvious from Tobler. They instead expressly use the present claims as a guide for its counsel to construct undisclosed combinations. Thus, as explained further below, Petitioner has failed to establish anticipation (Ground 2A) or obviousness (Ground 2B). EX2020, ¶¶136-138.

A. Ground 2A: Petitioner Fails to Establish Anticipation by Tobler

"Anticipation requires that the reference describe not only the elements of the claimed invention, but also that it describe those elements '***arranged as in the claim***.'" *Enfish, LLC v. Microsoft Corp*., 822 F.3d 1327, 1343 (Fed. Cir. 2016) (citing *Net MoneyIN, Inc. v. VeriSign, Inc*., 545 F.3d 1359, 1371 (Fed. Cir. 2008)). Anticipation also precludes "picking and choosing," which "has no place in" §102. *In re Arkley*, 455 F.2d 586, 587-88 (C.C.P.A. 1972). And of course, "a single prior

art reference must disclose every limitation of the claimed invention to anticipate." *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997).

Ground 2A asserts that Tobler anticipates claims 1 and 3-10 but misses the mark under each of the above legal requirements. First, Petitioner fails to establish that Tobler discloses the invention as arranged in the claims. Instead, it relies on "picking and choosing" from multiple lists within Tobler in an effort to reconstruct the claims. Second, Petitioner fails to address—much less establish—that Tobler teaches the "consisting of" limitation as recited in all claims. It further fails to address that Tobler expressly defines "composition" as an undifferentiated genus of mixed and sequential administration distinct from the *claimed* "combinations" and "compositions."

In short, Petitioner failed to establish that "[t]he identical invention" is shown in Tobler "in as complete detail as is contained in the patent claim." *Richardson v. Suzuki Motor Co*., Ltd., 868 F.2d 1226, 1236 (Fed. Cir. 1989).

1. Tobler Does Not Disclose the Recited Limitations as Arranged in the Claims

There is no meaningful contention in the Petition that Tobler describes the claimed subject matter as arranged in the claim without picking and choosing.[6] *See, e.g.,* Pet., 38 ("Embodiment E1 includes the combination of 'mancozeb+TX1.' Ex. 1006, 28:40. 'The term "TX1" means: "the compound A-1.1+a compound selected from the group P" [EX1006], 28:10-11.'"); EX2021, 114:7-115:6 (admitting that Tobler provides no examples with three active ingredients and does not use mancozeb in any biological examples). In considering what Tobler would nevertheless disclose to a POSA, it is necessary to recognize that fungicides are chemically and biologically active compounds, with the potential for both positive and negative interactions in terms of fungicidal activity and phytotoxicity. EX2020, ¶¶4, 132, 177. As Dr. Brannen testified, a POSA would not arbitrarily mix from a laundry list of chemically active fungicides at least because of unknown effects on

[6] The Petition does assert that "[t]he ***complete combination*** of all three is finally taught at col. 22, ln. 63, 65, Col. 23, ln. 14, 21 where azoxystrobin, picoxystrobin (strobilurins) or cyproconazole, prothioconazole azoles are listed as a group P compound. Ex. 1003, ¶ 94." Pet., 38. But, as even recognized there, Petitioner is not identifying any specifically disclosed three-component "complete combination" but is selecting components (e.g., azoxystrobin) from the 250+ possible group P genus.

(i) efficacy, (ii) chemical and physical compatibility, and (iii) phytotoxicity. EX2021, 33:8-34:5, 35:15-38:11. EX2020, ¶¶4, 177, 132. Instead, multiple fungicides are most commonly used as sequential (unmixed) applications and guidance on chemical and physical stability is needed for their mixing. EX2021, 14:14-16:3, 16:22-18:7, 21:9-23:8; EX2020, ¶¶100-101, 132, 164, 177, 231.

Indeed, in prosecuting claims to the two-component fungicides claimed in Tobler, Petitioner distinguished an earlier reference disclosing a large laundry list of fungicides because "no specific combination of active ingredients is disclosed, let alone combinations with specific fungicidally active compound classes or specific fungicides." EX2034, 6. These distinctions on which Petitioner relied to obtain allowance of Tobler over earlier prior art apply equally to its allegations that Tobler anticipates any claim of the '727 patent. Indeed, Tobler discloses no combinations of three fungicide classes, no combinations of three specific fungicides, and no properties of any three-component mixture. Merely listing a vast genus of possible additional components, such a Tobler group P, would not have put a POSA in possession of or enabled every possible combination thereof. EX2020, ¶¶150-151, 153; *Impax Laboratories, Inc. v. Aventis Pharm. Inc.*, 468 F.3d 1366, 1383 (Fed. Cir. 2006).

But even looking past the fact that Tobler does not explicitly disclose any claimed combination as arranged in the '727 patent claims, any specific three-

component combination would require a POSA to *ignore* Tobler's focus on and express preference for two-component combinations. *E.g.,* EX1006, 29:51-31:6 (identifying "preferred" embodiments; *cf., In re Petering,* 301 F.2d 676, 681 (C.C.P.A. 1962) (relying on "specific preferences" to narrow the genus). After ignoring Tobler's two-component focus and preferences, a POSA would then need to:

1. Select embodiment E1 over embodiment E2.[7]
2. Select sub-genus "mancozeb+TX1" from among a list of **over 120 options** for E1.[8]
3. Select TX1 to be one of the claimed EBIs or QoIs from the **250+** group P components, where such fungicides comprise a fraction (less than 20%) of the recited compounds.[9]
4. Since more than one group P component could be included, omit other components excluded by the claims to meet the "consisting of" limitation (which Petitioner does not address).[10]

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[7] EX1006, 28:6-8 (E1 and E2).

[8] EX1006*,* 28:9-57 (E1 options).

[9] EX1006*,* 22:61-25:67 (defining group P); EX2020, ¶¶152, 156-157.

[10] Pet., 34-35 ("Tobler also discloses three component (B)s can be used giving a 4-way mixture…. It follows that POSA would include different modes of action.…");

5. Select a *mixed* combination from among 13 different permutations of a three-component "composition" (which Petitioner does not address), according to Tobler's definition that encompasses any permutation of mixing and sequential applications.[11]

EX2020, ¶¶139-155.

Especially given the multiplicity of necessary selections, Petitioner fails to establish that Tobler "provide[s] specific guidance that would lead a person of ordinary skill to an embodiment within the claim." *Otonomy, Inc. v. Auris Med., AG*, 743 F. App'x. 430, 439 (Fed. Cir. 2018) (affirming PTAB determination of nonanticipation). This is true regardless of whether considered from the perspective of Tobler's largest three-component E1 + E2 genus (step 1 above) or the smaller—but still unduly large—"mancozeb + TX1" genus (step 2 above). EX2020, ¶156. Instead, "[l]ooking at the number of possible formulations and combinations disclosed… nothing therein would lead a person of ordinary skill in the art to pick

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EX1006, Abstract ("(B) at least one compound"), 22:59-60 ("[S]uitable compounds as component (B) are compounds selected from the following group P"), 37:33-38 ("at least one compound (B)"); EX2021 105:21-106:12 (Tobler E1 open to multiple group P compounds); EX2020, ¶¶153-154.

[11] EX1006, 27:55-64; EX2016; EX2021, 87:16-89:12; EX2020, ¶¶148-149.

and choose among the elements of the disclosure to arrive at a" claimed combination or composition. *Id.*

a. E1 Genus

Even looking just at genus E1, a POSA would still need to make unguided selections 2, 3, 4, and 5, which would cover a genus of at least 390,000 theoretical permutations (120+ E1 compounds × 250+ group P compounds × 13 options for sequential or simultaneous treatment). EX2020, ¶152; EX2021, 92:2-24, 102:2-12. The "number of categories and components disclosed in [Tobler] is so large that the [claimed] combination… would not be immediately apparent to one of ordinary skill in the art." *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1382 (Fed. Cir. 2015) (citations and quotations omitted);[12] *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999 (Fed. Cir. 2006) ("It is well established that the disclosure

[12] Petitioner relies on *Kennametal* for the proposition that "a reference disclosure can anticipate a claim even if the reference does not describe the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination." Pet., 33 (quoting *Kennametal* (cleaned up)). Unlike the thousands of permutations here, however, the prior art in *Kennametal* covered only 15 possible combinations (5 metals, 3 coating methods). *Kennametal,* 780 F.3d at 1380.

of a genus in the prior art is not necessarily a disclosure of every species that is a member of that genus."); EX2020, ¶156.

While the Board found the "E1" genus less relevant where "Tobler explicitly spells out" "mancozeb+TX1," (ID, 14), mancozeb+TX1 is not an anticipatory species but yet another genus. And Petitioner provides no reasons—but for hindsight—to focus on "mancozeb+TX1." *Cf. Petering,* 301 F.2d at 681. Thus, Tobler's reference to a non-preferred "mancozeb+TX1" genus does not support anticipation, which "requires that the reference provide ***specific guidance*** that would lead a person of ordinary skill to an embodiment within the claim." *Otonomy*, 743 F. App'x at 439 (Fed. Cir. 2018).

b. Mancozeb+TX1 Genus

Even if Tobler is narrowed to the "mancozeb+TX1" genus, a POSA would still need to consider selections #3 (250+ group P components), #4 ("consisting of) and #5 (13 "compositions"). Leaving aside the "consisting of" limitation for the moment, this genus includes at least 3,250 (250x13) theoretical species. It remains far too big for a POSA to have envisaged each individual species thereof. *Mylan Pharms. Inc. v. Merck Sharp & Dohme Corp*., 50 F.4th 147, 153-54 (Fed. Cir. 2022) (affirming that claims were not anticipated where the 957 possible combinations of prior art components A and B were "a far cry from the 20 compounds 'envisaged' by the narrow genus in *Petering*") (citing *In re Petering*, 301 F.2d at 681); *Nidec*

Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd., 851 F.3d 1270, 1274-75 (Fed. Cir. 2017) (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); EX2020, ¶156.

The testimony of Petitioner's declarant, Dr. Brannen, further reflects that, as a factual matter, a claimed combination would not have been envisaged by a POSA. Even with reliance on a color-coded claim chart prepared by Petitioner's counsel, Dr. Brannen had significant difficulty trying to interpret the meaning and scope of Tobler's "TX1" and group P. EX2021, 91:17-106:12. Petitioner's inconsistent contrary contention—that "[t]he substantial overlap with the [Tobler] group P demonstrates the ease with which a POSA would envisage 47 of the 55 possible third components when making the claimed combinations." (Pet., 31-32 (citing EX1003, ¶¶142-144))—is multiply flawed.

First, rather than provide support for this position, the cited portions of Dr. Brannen's declaration (EX1003, ¶¶142-144) "merely repeats, verbatim, the conclusory assertion for which it is offered to support" and "does not cite to any additional supporting evidence or provide any technical reasoning to support his statement." *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential) (holding that conclusory testimony was "entitled to

little weight"); *compare* EX1003, ¶¶143-144 ("Group P components… a POSA would have immediately recognized Tobler as disclosing the fungicidal combinations set forth in claim 1.") *with* Pet., 31-32; EX2021, 105:6-11 (taking over 10 minutes to identify the group P components). Petitioner's deficient evidence is similar to *OSRAM Sylvania Inc. v. American Induction Tech. Inc.*, cited by Petitioner (Pet., 32-33), which *reversed* the district court's finding that a POSA would have understood prior art teaching "approximately 1 torr or less" to disclose the claimed "less than 0.5 torr" for failure to consider how a POSA would understand the size of the prior art genus. 701 F.3d 698, 706 (Fed. Cir. 2012).

Second, Petitioner's reliance on "overlap" with the claims as support for what a POSA would envisage is an admission of hindsight reconstruction. *In re Fine*, 837 F.2d 1071, 1075-76 (Fed. Cir. 1988). Considering what a POSA would "envisage" should only look to the reference's disclosure without regard to any "overlap" considered in hindsight. *See Petering,* 301 F.2d at 681 (relying on preferences *within* the prior art reference to narrow its genus). Since the large genus—whether 390,000 permutations or 3,250 permutations—is entirely undifferentiated, a POSA would need to be able to envisage *all* species to be able to envisage any individual allegedly anticipatory species. *See id.* ("It is our opinion that one skilled in this art would, on reading the Karrer patent, at once envisage ***each member*** of this limited class….").

"Overlap" aside, Petitioner has not shown and cannot show that each of the massive number of permutations would have been envisaged.

Although not relied upon by Petitioner, the Board noted that *Perricone v. Medicis Pharm. Corp* ("*Perricone*") "rejected the notion that an ingredient cannot anticipate because it 'appears without special emphasis in a longer list.'" ID, 14 (quoting 432 F.3d 1368, 1376 (Fed. Cir. 2005). Notably, the reference at issue in *Perricone* listed only "a total of fourteen skin benefit ingredients," *Perricone*, 432 F.3d at 1376, which is *less* than the genus of 20 compounds found to anticipate each species in *Petering,* 301 F.2d at 681. *Perricone* was thus based on being able to envisage the use of each possible ingredient without hindsight consideration of percent overlap with the claimed subject matter. *See* Perricone, 432 F.3d at 1377 ("That specific disclosure, even in a list, makes this case different from cases involving disclosure of a broad genus without reference to the potentially anticipating species."). Moreover, "*Perricone* does not hold that a specific unknown composition is deemed known if its components can be found separately on lists of possible components." *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 638 F.3d 1356, 1371-72 (Fed. Cir. 2012) (Newman, P, concurring). *Perricone* is also materially distinguishable as it addressed anticipation from a *single list* of components.

Any purported anticipation from Tobler requires the unguided selections from multiple lists (E1, "Mancozeb+TX1," "group P," and "composition"). EX2020, ¶¶151-155. Yet other than hindsight "overlap," Petitioner neither asserts nor does Tobler provide any basis from which a claimed combination or composition would have been immediately apparent to a POSA. EX2020, ¶¶151, 155. *In re Ruschig,* 343 F.2d 965, 973 (C.C.P.A. 1965) (rejecting "the mechanistic dissection and recombination of the components of the specific illustrative compounds in every chemical reference containing them, to create hindsight anticipations").

Finally, even if "overlap" is considered, Petitioner ignores that (1) the 47 group P members on which it relies are from an undifferentiated laundry list of over 250 group P compounds and (2) there are 13 types of three-component "compositions" according to Tobler. EX1006, 27:55-64; EX2016; EX2021, 88:10-89:12. This corresponds to 3,250 (250+ group P x 13 "composition") permutations. Thus, even if 47 of the 250 group P *compounds* overlap with claimed components, the only possible "overlap" with a claimed "combination" or "composition" is when all components are mixed together. *Section III.A, supra.* Ignoring other variables and differences, this means that only about 1% (=47/3250) of the Tobler "mancozeb+TX1" genus theoretically overlaps with any claimed mixed "combination" or "composition." This is far less any overlap than in *Perricone*.

2. Petitioner Fails to Address All Limitations

Petitioner further failed to establish anticipation as it ignored multiple limitations. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 851 F.3d 1270, 1274-75 (Fed. Cir. 2017) (stating that a reference missing a limitation cannot anticipate a claim even if a POSA viewing the reference would "at once envisage" the missing limitation); *see also Mrsi Sys., LLC v. Palomar Techs., Inc.*, IPR2016-00043, Paper 29 at 16 (PTAB Mar. 29, 2017) ("[I]t is not Patent Owner's burden to identify limitations missing from the prior art; instead, it is Petitioner's burden to establish that the prior art discloses the limitations of each challenged claim.") (*citing In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016) (burden-shifting "does not apply in the adjudicatory context of an IPR")).

a. "Consisting of" Limitations

Petitioner nowhere addresses how Tobler would meet the "consisting of" limitation that excludes unrecited fungicides. *See Intl. Bus. Machines Corp. v. Iancu*, 759 F. App'x. 1002, 1011 (Fed. Cir. 2019) ("Silence in that sense would not by itself suffice for the Petitioner to meet its burden to prove, by a preponderance of the evidence, that there was *no* user authentication action in this scenario. *See* 35 U.S.C. § 316(e). Nor would that burden be met merely by adding a finding that IBM did not prove the opposite….") (reversing IPR finding of anticipation for lack of teaching negative limitation).

Instead, as Petitioner and its declarant admitted, Tobler is open to multiple group P compounds. Pet., 34-35 ("Tobler also discloses three component (B)s can be used giving a 4-way mixture…. It follows that POSA would include different modes of action….") (citing EX1006, 27:65-28:5); EX2021, 105:21-106:12; EX1006, Abstract ("(B) at least one compound"), 22:59-60 ("Suitable compounds as component (B) are compounds selected from the following group P"), 27:65-28:5, 29:53-56 ("comprising"), 37:33-38 ("at least one Compound (B)"). However, group P includes numerous compounds outside the scope of, e.g., "combination consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from an [EBI] fungicide, and a [QoI] fungicide," as more specifically recited in the claims. EX1001, claim 1; EX2020, ¶¶153-154 (identifying anilzazine, arsenates, benalaxyl, as examples of group P compounds excluded from the claims).

Thus, Petitioner failed to argue much less establish that Tobler "provide[s] specific guidance that would lead a person of ordinary skill to an embodiment within the claim" that excludes such unclaimed compounds.

b. Claimed "Combinations" and "Compositions"

Petitioner does not address purported anticipation in light of Tobler's express definition of "composition" that allows for *sequential* application of components. *See* EX1006, 27:55-64 (Tobler definition of "composition"); EX2021, 87:16-88:10, 91:10-15; EX2016; EX2020, ¶¶148-149. This is different from the meaning of

"combination" and "composition" as used in the art and in the present claims. *Section* VIII.A., *supra*. Asserting that Tobler describes a "composition" under Tobler's definition therefore does not establish anticipation of a claimed "combination" or "composition." *E.g.,* Pet., 30-31 (quoting Tobler for disclosure of "compositions"); *see also InTouch Techs., Inc. v. VGO Commun., Inc.,* 751 F.3d 1327, 1350 (Fed. Cir. 2014) ("While Dudenhoeffer includes the term 'arbitration,' this alone is insufficient to permit the conclusion that it refers to the same *type* of arbitration at issue in the '357 and '030 patents."); *Medrad Inc. v. MRI Devices Corp*., 401 F.3d 1313, 1318-1319 (Fed. Cir. 2005) (recognizing that the same term may have different meanings in different documents).

Importantly, a POSA would understand that not all group P components used in the "mancozeb+TX1" genus are suitable for use in mixed combinations or compositions. EX2020, ¶¶157-168. Further, as reflected in the testimony of Dr. Brannen, a POSA also would not have assumed that all different fungicides are suitable or compatible for use as a mixed combination. EX2021, 33:8-34:6, 35:15-36:11, 36:18-37:13, 38:14-39:15, 40:19-41:5, 42:12-17; EX2020, ¶¶157-168; EX2021, 54:4-16; 59:5-18. Consequently, absent guidance—which Tobler does not have—directing physically mixing components, a POSA would not have envisaged each individual "mancozeb+TX1" species as being in a mixed combination as

opposed to a broader and undifferentiated Tobler "composition." EX2020, ¶¶168-169.

For example, as recognized by Dr. Brannen, one could not combine, or would not know how to combine, Bordeaux mixture in a mixed combination or composition with mancozeb. EX2021, EX2021, 54:4-16; *see also* EX2020, ¶159 (e.g. group P components Bordeaux mixture (87), Dithianon (279), and Ethephon (307), are incompatible with mancozeb). Beyond these facially incompatible components, which could at best be applied sequentially as allowed for by Tobler's broad "composition" definition, Tobler provides no guidance as to which components could be used in a mixed "composition" and which should be used in a one or another type of sequential "composition." EX2020, ¶¶157-158, 168-169. Thus, because a POSA would not have read Tobler as teaching that all group P components could be used in mixed combinations and compositions as claimed, a POSA would not read the Tobler "compositions" genus to teach mixed combinations and compositions, as claimed, across the group P genus. EX2020, ¶¶168-169.

Since the Petition failed to provide any reason as to why any "mancozeb+TX1" species would be envisaged as a mixed combination or composition, it necessarily failed to establish anticipation.

3. Petitioner Has Not Shown That Tobler Teaches Any Narrower Claim

Petitioner's allegations beyond claim 1 are conclusory, at best, and fail to establish anticipation. EX2020, ¶¶170, 185-201.

For example, Petitioner's arguments that claims 3-4 are anticipated based on "overlap" are flawed for the same reasons discussed above. Pet., 36. Moreover, even accepting Petitioner's "overlap" theory, they are further flawed due to the necessarily—but unaddressed—smaller overlap of these narrower dependent claims. EX2020, ¶¶170, 185-201.

As another example, claim 5 is directed to compositions and claim 6 to specific types thereof. EX2020, ¶¶170, Petitioner asserts a "POSA would have been ***motivated to formulate*** the fungicidal combinations disclosed and suggested by Tobler." Pet., 38; EX2020, ¶¶195-201. An alleged "***motivation to formulate***" does not, however, even purport to argue anticipation. Similarly, Petitioner argues that ranges of component ratio and amounts in Tobler "encompass," "overlap," or "embrace" the those of claims 7-8. Pet., 39-41. None of these are bases for anticipation.

For method claims 9 ("applying… to the foliage") and 10 ("applying to the locus"), Petitioner relies on Tobler's disclosure that "Some compositions according to the invention have a systemic action and can be used as foliar, soil and seed treatment fungicides" to argues that both methods are disclosed by Tobler. Pet., 41-

42 (quoting EX1006, 35:29-31). That "some compositions" can be applied to certain locations does not support anticipation of the specifically claimed combinations and compositions being so applied.

B. Ground 2B: Petitioner Fails to Establish Obviousness in View of Tobler and Godoy

Petitioner argues in the alternative that claims 1-10 would have been obvious based on Tobler and Godoy.[13] *See*, *e.g.*, Pet., 27, 32-34; EX2020, ¶¶171-177. But "[i]n light of" Petitioner's (1) failure to address all of Tobler's missing limitations (as discussed above) and (2) "failure to explain why a POSA would have sought to combine the prior art references to achieve the claimed invention," the Board has no basis to conclude that Petitioner has met its "burden of proving by a preponderance

[13] In Section IV ("precise relief requested") and VIII.B, and Petitioner defines Ground 2 only as anticipation by Tobler "and/or obvious[ness] over the ***combination*** of Tobler and Godoy" without separately asserting obviousness based on Tobler. Yet within Ground 2, Petitioner inconsistently includes a heading asserting that "Claim 1 is Anticipated or Obvious Over Tobler—optionally in view of Godoy." For completeness, Patent Owner addresses both obviousness over (1) Tobler and (2) Tobler in view of Godoy, even though the former was not preserved as relief requested under § 42.204(b).

of the evidence that the claimed invention would have been obvious." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

1. Petitioner Fails to Show That A POSA Would Have Been Motivated to Select the Claimed Fungicidal Combinations from Tobler

Petitioner summarily argues that Tobler "provides data [that would] highly motivate [a POSA] to combine ***benzovindiflupyr*** with an ***azole fungicide*** (cyproconazole) or a ***strobilurin fungicide*** (cyproconazole)." Pet., 34. But combining benzovindiflupyr with either of these fungicides fails to address any motivation to combine with ***mancozeb***, as required by all claims. EX2020, ¶¶178-184. *Inconsistent* with motivation to use three fungicides, Tobler reports that two-part combination (benzovindiflupyr with an azole or strobilurin) routinely achieved 100% fungicide control. EX1006, 41:36-61:28 (Examples B2-B10); EX1003, ¶146; EX2020, ¶136; *In re Anova Hrg. Labs, Inc.*, 809 F. App'x. 840, 843 (Fed. Cir. 2020) (vacating and remanding on obviousness where "[t]he Board also does not explain why a person of ordinary skill in the art would be motivated to modify Brown, which already includes vents, to address occlusion effect"). In light of Petitioner's failure to explain why a POSA would have been motivated to combine *all* required components (including mancozeb), "the Board ha[s] no basis [for finding]… that [Petitioner] had met its burden of proving by a preponderance of the evidence that

the claimed invention would have been obvious." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Petitioner otherwise provides no rationale for how a POSA would navigate through the vast Tobler genus of combinations and permutations. EX2020, ¶¶151-170; §V.A, *supra*. Worse, Petitioner fails to address—much less answer—that a POSA would need to ignore Tobler's express teaching of preferred embodiments and instead have been directed to three-component. EX2020, ¶¶136, 142-143; *see In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994) ("A disclosure of millions of compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.").

Again, leaving aside that all of Tobler's preferences are for two-component treatments, to potentially arrive at a claimed combination or composition, a POSA would need to:

1. Select embodiment E1 over embodiment E2;
2. Select sub-genus "mancozeb+TX1" from among a list of **over 120 options** for E1, where mancozeb+TX1 is the 82nd item in the list and is not identified as preferred or otherwise singled out;
3. Select from the **over 250** group P components, one of the claimed EBIs or QoIs (less than 20%);[14]

[14] EX2020, ¶¶152, 156-157.

4. Omit the use of other group P compounds excluded by the claims to meet the "consisting of" limitation (which Petitioner does not address);[15]
5. Contrary to standard practice and preference for sequential treatments,[16] select a *mixed* combination from among 13 different permutations of a three-component "composition" (which Petitioner does not address).[17]

EX2020, ¶¶139-155.

Conservatively assuming E1 as a starting point without considering the "consisting of" limitation (only steps 2, 3, 5 above), this genus encompasses 390,000+ potential species (120 E1 options x 250 group P options x 13 "compositions" options). Even if—as alleged by Petitioner (Pet., 32)—47 sets of three-components could fall within any of claims 1-10, that is only 0.01% overlap (47/390,000) of the potential three-component species. EX2020, ¶¶151-155. Similarly, if starting with E1 pre-selected as "mancozeb+TX1," the genus still contains over 3,250 (250 group P options x 13 "compositions" options) theoretical

[15] EX2020, ¶¶153-154.

[16] *E.g.,* EX2021, 12:8-13:7, 14:14-16:3, 16:22-18:7, 21:9-23:8; EX2020, ¶3 (citing EX2032, EX2033).

[17] EX2020, ¶¶148-149.

species, of which only 1% (47/3250) could potentially overlap with the claims. In either case, Petitioner provides no rational for how a POSA would have been guided to the 0.01% (47/390,000) or 1% (47/3,250) of species on which it focuses. EX2020, ¶¶156, 175; *In re Jones*, 958 F.2d 347, 350 (Fed. Cir. 1992) (explaining that a disclosure of a chemical genus does not automatically render obvious any species within the genus).

Regardless of the starting point, a POSA would not have read Tobler as teaching that all potential three-component selections, such as with group P compounds, could be combined as *mixed* compositions, as required by the challenged claims. EX2020, ¶¶156-169. Indeed, Tobler simply teaches the "composition" genus and nowhere teaches which potential sets of three-components should be used in which of 13 possible "composition" types according to its broad definition thereof. EX2020, ¶¶168-169; EX2016, EX2021, 88:18-89:12.

To the contrary, consistent with the testimony of Dr. Brannen, one would need guidance regarding compatibility of fungicides in a mixture. EX2021, 33:8-34:6, 35:15-36:11, 36:18-37:13; EX2020, ¶¶168-169. Reinforcing that a POSA would not understand Tobler to teach that all components could be used as mixed combinations, a POSA would understand that not all Tobler group P components could or should be mixed together with benzovindiflupyr and mancozeb (Tobler mancozeb+TX1). *See* EX1006, 23:55-56, 23:58-59, 23:62, 23:65, 24:1, 24:4-6,

24:9, 24:12, 24:19, 24:25-26, 24:34-35, 24:40-41, 24:44, 24:46, 24:60-62; EX2020, ¶¶158-159, 162-164, 166-167 (citing EX2030, 102-103, 134, 149, 169, 204, 286, 335, 345, 356, 377-78, 407, 426, 484, 496, 503, 532-33, 874, 890, 995, 1016, 1020; EX2020, ¶165 (citing EX2024, 87); EX1006, 23:56, 24:6, 24:19; 24:60-61); EX2020, ¶160 (citing EX2025; EX2026, EX2046).

Further reinforcing that a POSA would not read Tobler as teaching or suggesting that all or any specific potential three-component selections could be mixed together, some Tobler group P components are not fungicides or suitable for use, even if applied separately, therewith. EX1006, 24:59-25:67; EX2020, ¶161. For instance, a POSA would understand the FDA has found mercury containing compounds are even not suitable for crops (e.g., mercuric chloride (511), mercury). EX1006, 24:19-20; EX2020, ¶161 (citing EX2055, 27). Likewise, a POSA would understand other of Tobler's group P compounds are phytotoxic to plants and thus not suitable, *e.g.*, Paraffin oils, Pentachlorophenyl, Glyphosate, Fomesafen. EX1006, 24:25, 2:31, 24:67, 25:13; EX2020, ¶162 (citing EX2030, 761, 755, 513-16, 492-93).

Thus, because Petitioner failed to establish how a POSA would navigate through the vast Tobler genus of combinations and permutations, it has not shown Tobler to render obvious any claim.

2. Petitioner Does Not Provide a Motivation to Combine Tobler and Godoy to Yield a Claimed Combination or Composition

Petitioner argues that "Godoy provides further motivation for the combination" (Pet., 33) but provides no basis for why a POSA would be motivated to combine Tobler and Godoy in the first place—because there is no motivation to combine. EX2020, ¶¶178-184; Pet., 33-34; *Auris Health, Inc. v. Intuitive Surgical Operations, Inc*., 32 F.4th 1154, 1158 (Fed. Cir. 2022) ("The motivation-to-combine inquiry asks whether a skilled artisan not only could have made but would have been motivated to make the combinations… of prior art to arrive at the claimed invention." (quotation marks and citation omitted)). It is also legally insufficient "to say no more than that a skilled artisan, once presented with the two references, would have understood that they could be combined… that is not enough: it does not imply a motivation." *Personal Web Techs., LLC v. Apple*, Inc., 848 F.3d 987, 993 (Fed. Cir. 2017). "It is not enough, even after *KSR*, to support a determination of obviousness that a reference includes a broad generic disclosure and a common utility to that in the claims and other prior art references—there must be some reason to select a species from the genus." *Knauf Insulation, Inc. v. Rockwool Intl. A/S*, 788 F. App'x. 728, 733 (Fed. Cir. 2019).

"In light of [Petitioner's]… failure to explain why a skilled artisan would have sought to combine the prior art references to achieve the claimed invention,"

the Board has no basis to conclude that Petitioner has met its "burden of proving by a preponderance of the evidence that the claimed invention would have been obvious." *In re Magnum Oil Tools Int'l, Ltd*., 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Even if Tobler and Godoy were combined, Petitioner failed to establish that (1) Godoy is prior art, (2) Godoy teaches claimed mixed combinations or compositions, and (3) the "consisting of" limitation is met where Godoy uses "Nimbus" in each relied-upon benzovindiflupyr treatment. *Supra* §IV.A, V.A.1, IV.C. Thus, for the same reasons that Petitioner's Ground 1 fails, its assertion of obviousness based on Tobler in view of Godoy likewise fails.

3. Petitioner Has Not Established Obviousness of Four-Component Combinations of Claim 2

Claim 2 requires four fungicides: (1) benzovindiflupyr, (2) mancozeb, (3) an EBI from a specific listing, and (4) a QoI fungicide from a specific listing. EX2020, ¶185. Petitioner does not allege anticipation by Tobler but asserts that claim 2 is obvious over Tobler "optionally in view of Godoy." Pet., 34. Petitioner's obviousness arguments in this regard are even weaker than those above where only three components are required.

According to Petitioner,

- "Tobler also discloses three component (B)s can be used giving a 4-way mixture,"

- "[i]n selecting the fungicides for compound B, a POSA would have selected fungicides with different modes of action for the combination,"
- "Tobler discloses various ergosterol biosynthesis inhibitor fungicides (*e.g.,* cyproconazole, prothioconazole); quinone outside inhibitor fungicides (*e.g.*, azoxystrobin, picoxystrobin); and mancozeb as acceptable (B) components," and
- "it would be obvious to use a combination of these three (B) components with benzovindiflupyr."

Pet., 34-35. Petitioner further argues "Godoy further supports the obviousness of claim 2 for the reasons discussed [above]." Pet., 35-36. Petitioner, however, fails to establish obviousness of claim 2 over Tobler or Tobler in view of Godoy.

First, for the same reasons Petitioner failed to establish a POSA would find the three-part combinations of claim 1 obvious, claim 2 is likewise nonobvious. Section B.1-2, *supra*; EX2020, ¶¶139-170, 185-194. For instance, Petitioner provides no motivation for any specific three- or four-component selection, fails to address the "consisting of" limitation that excludes other Tobler group P components and Nimbus mineral oil or sulfur according to Godoy, and fails to address differences between a "composition" according to Tobler or an "association" according to Godoy and the claimed mixed combinations and compositions. Accounting for yet

another unguided selection from Tobler group P, the theoretical Tobler genera of four-components are also ~250x larger than its three-component genera.

Second, Petitioner's generic argument that "[i]n selecting the fungicides for compound B, a POSA would have selected fungicides with different modes of action for the combination" does not lead to use of mancozeb, benzovindiflupyr, a claimed EBI, and a claimed QoI. Indeed, other than "different modes of action"—which could apply to any of the many different fungicide classes, Petitioner does not provide any reasons for selecting both an EBI and a QoI together with mancozeb and benzovindiflupyr. Nor does Petitioner provide a reason for selecting a claimed EBI and a claimed QoI together with these components.

Third, as discussed above (§V.B.2), Petitioner does not provide motivation for a claimed mixed "consisting of" combination or composition. Its proposed—but unsupported—combination of mancozeb, an EBI, and azoxystrobin with benzovindiflupyr (Pet., 28, 30) is also contrary to the known use of azoxystrobin with benzovindiflupyr according to the Elatus® product label. EX1009; EX2021, 31:7-14 (agreeing "a person of ordinary skill in the art would have relied upon" the label), 38:14-39:15 (no compatible fungicides identified).

Thus, for these reasons and same reasons Petitioner failed to establish a POSA would find the three-part combinations of claim 1 obvious, Petitioner has likewise failed to establish obviousness of claim 2. EX2020, ¶¶185-194 (citing EX2047,

EX2048, EX2049, EX2050, EX2024, EX2051, EX2052, EX2053, EX2054, EX2056).

4. Petitioner Has Not Established Any of the Dependent Claims are Anticipated or Obvious

Petitioner only provides conclusory arguments for why it contends dependent claims 3, 4, 6, 7, 8, and 9 are obvious. Pet., 36-42. And Petitioner's declarant, Dr. Brannen, merely parrots the Petition's conclusory assertions. *Compare* EX1003, ¶¶163-165, 172-188 with Pet., 36, 37-42; *Xerox*, IPR2022-00624, Paper 9 at 15. Petitioner has not met its burden to establish any dependent claim is anticipated or obvious.

For example, claim 6 depends from claim 5 and further claims formulations of the claimed 3-component combinations that would be applied as mixtures. EX2020, ¶¶196-197. Petitioner provides only the conclusory argument that Tobler anticipates or renders obvious optionally in view of Godoy claim 2. Not so.

First, while Tobler discloses formulations, it does so only for two-component fungicides; it does not disclose any three-component formulations, much less any claimed three-component *combinations*. EX1006 (Tobler) 39:25-40:67; EX2020, ¶¶198-199.

Second, Petitioner has not explained why a POSA would have been motivated to co-formulate benzovindiflupyr with mancozeb (much less with a third fungicide) in view of art teaching otherwise. EX2020, ¶200-201. This is especially problematic

where the labels of benzovindiflupyr and mancozeb teach away from applying as mixtures, directing the application of the two fungicides at different time intervals. This would necessarily require benzovindiflupyr and mancozeb component fungicides be applied sequentially, not together as a combination. Likewise, Petitioner has not established that a POSA would mix untaught combinations together, and in fact, their declarant testified otherwise. *See supra* §IV.A.

Third, Petitioner failed to establish Godoy teaches a mixture of benzovindiflupyr with mancozeb. *See supra* §IV.B.

Thus, Petitioner has not pointed to anything and failed to establish that Tobler anticipates or renders claim 6 obvious optionally in view of Godoy.

VI. DE OLIVEIRA DOES NOT RENDER ANY CLAIM [GROUND 3]

Petitioner contends that all claims are obvious over De Oliveira (EX1007) alone ("Ground 3A") or optionally in view of Wiglesworth, Tobler, and Godoy ("Ground 3B"). Pet., 50. Petitioner has not established either renders the '727 patent obvious. EX2020, ¶¶9-12.

Recognizing that "De Oliveira discloses a number of specific SDHIs, [but] De Oliveira does not disclose benzovindiflupyr," Petitioner argues that

> the addition of benzovindiflupyr, despite not being specifically disclosed in De Oliveira, would have been obvious based on the general disclosure of De Oliveira as evidenced by the fact that benzovindiflupyr is an SDHI.

Pet., 52-53. EX2020, ¶¶202-205. Yet, among other defects, Ground 3A omits any rationale as to *why* a POSA would have selected an undisclosed SDHI (benzovindiflupyr) over other SDHIs disclosed in—and preferred by—De Oliveira. EX2020, ¶206; EX1007, 15 (16 preferred SDHIs).

For Ground 3B, Petitioner contends that the combination of "Wiglesworth, Tobler, and Godoy further support the obviousness of claim 1" based on De Oliveira. Pet., 52-54. Pointing only to isolated disclosures from each of the three secondary references, Ground 3B entirely fails to address, *inter alia,* a motivation to combine any secondary reference with De Oliveira. *Id.*

As the Board acknowledged, "Patent Owner's arguments are not unreasonable." ID, 18, 19. Indeed, Petitioner's failure to provide a motivation for the selections and modifications necessarily to yield a claimed combination or composition are fatal to Grounds 3A and 3B. *In re Magnum Oil Tools*, 829 F.3d at 1380.

Pursuant to the Board's direction, these and additional defects in Petitioner's De Oliveira arguments are further addressed below.

A. Ground 3A: Petitioner Failed to Establish That De Oliveira Alone Renders Any Claim Obvious

Petitioner characterizes De Oliveira as disclosing a dominating genus that "encompass[es] the combinations of claim 1 of the '727 patent." Pet., 50. Petitioner relies on De Oliveira's disclosure that:

> treating the plant at the locus of the infection with a **dithiocarbamate fungicide**, and concurrently, prior or subsequently to the dithiocarbamate fungicide, with at least another fungicide selected from **a demethylation inhibitor**, **quinone outside inhibitor**, **succinate dehydrogenase inhibitor**, quinone inside inhibitor **or combinations thereof**.

and that "De Oliveira discloses mancozeb as a dithiocarbamate fungicide." Pet., 50-51 (quoting EX1007, pg. 7, 9 (emphasis added by Petitioner)) EX2020, ¶209. According to Petitioner, "[t]here is significant overlap between" the DMI and QoI fungicides according to De Oliveira and, respectively, the EBI conazoles and QoI fungicides claimed in the '727 patent. Pet., 51. Petitioner further cites to three De Oliveira combinations, none of which include an SDHI. Pet., 50-52 (citing EX1007, 25). Finally, Petitioner argues that "the addition of benzovindiflupyr, despite not being specifically disclosed in De Oliveira, would have been obvious based on the general disclosure of De Oliveira as evidenced by the fact that benzovindiflupyr is an SDHI." Pet., 52-53.

Starting with first principles—"differences between the prior art and the claims at issue" (*Graham v. John Deere*, 383 U.S. 1, 17 (1966))—Petitioner concedes that De Oliveira does not specifically describe a fungicidal combination or composition consisting of benzovindiflupyr, mancozeb, and at least one other claimed EBI or QoI. Indeed, Petitioner does not allege anticipation. In fact, the

relied-upon De Oliveira disclosure (reproduced above) has at least the following material differences:

1. At least three claimed components are not required, as it also covers dithiocarbamate and just *one* of the other listed fungicide classes. EX2020, ¶210.
2. Mancozeb is never required, and De Oliveira includes two dozen unclaimed dithiocarbamates. EX1007, pg. 8; EX2020, ¶211.
3. The second component can be an unclaimed QiI (Quinone *Inside* Inhibitor). EX2020, ¶221.
4. Following the dithiocarbamate, "additional components can be applied concurrently, prior or subsequently to the dithiocarbamate fungicide" (EX1007, p.7), not necessarily as a mixed combination or composition as claimed. *See* EX2021, 180:5-18, 185:8-11 (addressing De Oliveira's lack of guidance on concurrent, prior, or subsequent application of SDHI). EX2020, ¶212.
5. DMI and QoI fungicides are each entirely optional, but even including them, at least 15 DMI and 3 QoI (18 combined) fungicides disclosed in De Oliveira are excluded from the claims. EX1007, pg. 10-11; EX2020, ¶¶213-214.

6. SDHI is entirely optional; if included it need not be benzovindiflupyr, which is not even disclosed in De Oliveira or among its 16 preferred SDHIs. EX1007, pg. 15; EX2020, ¶¶215-220.
7. None of these potential De Oliveira combinations *exclude* components that are precluded by the "consisting of" scope of the challenged claims. Indeed, De Oliveira's disclose and allows for inclusion of at least 62 DMIs, QoIs, SDHIs, and QiIs that are beyond the claimed scope. EX1007, pg. 10-11, 14, 15; EX2020, ¶221.

EX2020, ¶¶206-221, 223. Similarly, among the relied-upon exemplary De Oliveira formulations, none include mancozeb and an SDHI. *See* Pet., 51-52 (citing EX1007, 7 (formulations A(2), B(2), C(2), D(2)). Ignoring these differences, Petitioner fails to provide any reason why a POSA would select from within the De Oliveira genus all the required components to the exclusion of components excluded by the "consisting of" limitation.

At most, Petitioner relies on

> (1) "De Oliveira discloses mancozeb as a dithiocarbamate fungicide" and "that the incorporation of mancozeb increased the [Asian soybean] rust control of the conventional strobilurin + conazole fungicide treatment standard" (Pet., 51-52);
> (2) "overlap" of De Oliveira DMI and QoI fungicides with, respectively, the claimed EBI conzaoles and QoI fungicides (Pet., 51); and

(3) "that benzovindiflupyr is an SDHI" (Pet., 52-53).

This is insufficient as a matter of law since "[t]he obviousness inquiry does not merely ask whether a skilled artisan could combine the references, but instead asks whether they would have been motivated to do so." *Adidas AG v. Nike, Inc*., 963 F.3d 1355, 1359 (Fed. Cir. 2020) (quotation omitted); *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification."); *St. Jude Med., LLC v. Snyders Heart Valve LLC*, 977 F.3d 1232, 1242-43 (Fed. Cir. 2020) ("It was [Petitioner's burden] to support its assertion [that a POSA would have been motivated to make the proposed combination to arrive at the claimed invention] by a preponderance of the evidence.") (citations omitted). Nor can Petitioner properly rely on "overlap" with the claims to justify selections within or modifications of De Oliveira as this would be pure hindsight. *Orexo AB v. Actavis Elizabeth LLC*, 903 F.3d 1265, 1268 & 1271-74 (Fed. Cir. 2018) ("The question is not whether the various references separately taught components of the [claimed combinations and compositions], but whether the prior art suggested the selection and combination achieved by the [] inventors.").

1. De Oliveira Does Not Disclose Benzovindiflupyr

The Petition's only Ground 3A basis for using an undisclosed benzovindiflupyr (presumably instead of preferred SDHIs taught by De Oliveira) [18] is that it "is an SDHI."[19] Pet., 52-53; EX1007, 16 (preferred SDHIs, e.g., "benodanil, flutolanil, mepronil," etc.); EX2020, ¶¶207-208, 215. That benzovindiflupyr "is an SDHI" is not a reason to select it over those disclosed in—and preferred by—De Oliveira. EX2020, ¶¶207-208, 215.

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[18] Whether benzovindiflupyr is being added *instead of* or *in addition* to a De Oliveira preferred SDHI is not clear from the Petition, which refers to "the ***addition*** of benzovindiflupyr…." Pet., 52; EX2020, ¶222. If in *addition* to a De Oliveira preferred SDHIs, the resulting combination would be outside the claimed "consisting of" limitation, which contemplates benzovindiflupyr as the only SDHI. EX2020, ¶222. If *instead of* other De Oliveira preferred SDHIs, the Petition provides no reason to select benzovindiflupyr over De Oliveira's 16 preferred SDHIs. EX2020, ¶¶207-208, 215.

[19] Dr. Brannen, cited by Petitioner in support, provides no other basis beyond "the general disclosure of De Oliveira and because benzovindiflupyr was known to be an SDHI as of the Priority Date." EX1003, ¶198; *see Xerox*, IPR2022-00624, Paper 9 at 15.

Petitioner's failure to establish a reason to select benzovindiflupyr over De Oliveira's preferred SDHIs is further reflected in Dr. Brannen's cross-examination. In particular, he admitted that a POSA would understand that the listed SDHIs—which do not include benzovindiflupyr—are preferred, though he was not familiar with all the components and did not himself know why they were preferred. EX2021, 177:2-178:22. As Dr. Jacobsen further explains, without a basis for De Oliveira's preferences having been provided, a POSA would not have been motivated to contradict those preferences. EX2020, ¶208.

2. Petitioner Has Not Established Motivation for Multiple Component Selections

Petitioner's failure to establish a motivation is further demonstrated by the multiple unsupported selections it makes from De Oliveira's dithiocarbamates, DMIs, QoIs, and QiIs.[20] "When prior art references require selective combination… there must be some reason for the combination other than the hindsight gleaned from the invention itself." *Interconnect Plan. Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

For instance, Petitioner provides no reason why a POSA would select mancozeb over the 24 alternative dithiocarbamates. EX2020, ¶211. And while Petitioner argues "De Oliveira disclose[s] use of a 'quinone outside inhibitor[s],'…

[20] QiIs are excluded from the challenged claim.

[and teaches] Demthylation inhibitors (DMIs) work by inhibiting the biosynthesis of ergosterol," (Pet., 51, (typographical error in original)) this is not a motivation to combine. EX2020, ¶¶213-214. Like Petitioner's Tobler arguments (*supra*, §V.A.1), in arguing "[t]here is significant overlap between the quinone outside inhibitor disclosure… and conazoles [DMIs] disclosed in De Oliveira and those claimed in '727 patent" (Pet., 51) Petitioner ignores the unclaimed QiIs, QoIs and DMIs disclosed in De Oliveira[21] and the undisclosed QoIs and EBIs claimed by the '727 patent.[22] EX2020, ¶¶213-214.

3. Petitioner Failed to Address The "Consisting Of" Limitation

Petitioner's Ground 3A fails to address the exclusion of other components—e.g. the 62 unclaimed fungicides—that would be necessary to meet the claimed "consisting of" limitation. EX2020, ¶¶221-222. This is not an academic question as De Oliveira, as relied upon by Petitioner, allows for multiple classes of fungicides, dithiocarbamates, DMI, QoI, SDHI, and QiI[23] fungicides excluded from the claims.

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[21] E.g. at least enestrobin, orysastrobin, climbazole, clotrimazole, prochloraz-manganese, diclobutrazol, diniconazole-M, fluotrimazole, furconazole, furconazole-cis, quinconazole, uniconazole, perfurazoate and uniconazole-P.

[22] E.g. at least pyribencarb, pefurazoate and pyrisoxazole.

[23] QiIs are categorically outside the scope of the challenged claims.

EX1007, pg. 7; Pet., 50-51; *see*, *e.g.*, "copper oxychloride, copper sulfate, copper hydroxide and tribasic copper sulfate (Bordeaux mixture)"; sulfur fungicides, "preferably elemental sulfur"; amobam, asomate, azithiram, carbamorph, cufraneb, cuprobam, disulfiram, ferbam, metam, nabam, tecoram, thiram, urbacide, ziram, dazomet, etem, milneb, mancopper, maneb, metiram, polycarbamate, propineb and zineb; phthalimide fungicides including "folpet, captan and captafol"; chloronitrile fungicides, preferably chlorothalonil; sulfamide fungicides, "preferably dichlofluanid and tolylfluanid"; guanidine fungicides including preferably "dodine, guazantine and iminoctadine"; quinone outside inhibitors such as cyazofamid and amisulbrom; and "benodanil, flutolanil, mepronil, fluopyram, fenfuram, carboxin, oxycarboxin, thifluzamide, bixafen, fluxapyroxad, furametpyr, isopyrazam, penflufen, penthiopyrad, sedaxane and boscalid." EX1007, 8-9, 14-15. Yet, Petitioner provides no reason for why a POSA would omit each of these components. EX2020, ¶¶221-222. As such, Petitioner has likewise failed to provide any motivation for a POSA to reach the "consisting of" limitation. EX2020, ¶¶222; *Xilinx, Inc. v. Analog Devices, Inc.*, IPR2020-01559, Paper 31 at 42 (PTAB March 11, 2022).

B. Ground 3B: Petitioner Failed to Establish Obviousness Over De Oliveira in view of Wiglesworth, Godoy, and Tobler

The Petition states "Wiglesworth, Tobler, and Godoy further support the obviousness of claim 1." Pet., 53; EX2020, ¶224. But Petitioner has failed to establish any reason to combine these secondary references with De Oliveira, much less, if combined, that they provide cure the deficiencies in De Oliveira. *See* Pet., 53-54; EX1003, ¶20; EX2020, ¶¶225-238. At most, the Petition relies on these secondary references with respect to use of benzovindiflupyr. It does not purport to rely on them to overcome any of De Oliveira's at least six other material shortcomings, identified above. And with respect to benzovindiflupyr, the references do not even suggest modifying De Oliveira.

1. Petitioner Failed to Establish a Motivation to Combine

The Petition fails to establish that a POSA would have been motivated to combine De Oliveira with the secondary references, merely asserting that "Wiglesworth, Tobler, and Godoy further support the obviousness of claim 1" and then discussing their isolated disclosures. Pet., 53-54. And Petitioner's declarant, Dr. Brannen, merely parrots the Petition's conclusory assertions. *See* Pet., 53; *Compare* EX1003, ¶¶199-203 with Pet., 53-54; *Xerox*, IPR2022-00624, Paper 9 at 15.

Of course, "[i]t was [Petitioner's burden] to support its assertion [that a POSA would have been motivated to make the proposed combination to arrive at the claimed invention] by a preponderance of the evidence." *St. Jude Med., LLC v. Snyders Heart Valve LLC*, 977 F.3d 1232, 1242-43 (Fed. Cir. 2020) (citations omitted); 35 U.S.C. § 316(e); "In light of [Petitioner]'s failure to explain why a skilled artisan would have sought to combine the prior art references to achieve the claimed invention, the Board had no basis for its conclusion that [Petitioner] had met its burden of proving by a preponderance of the evidence that the claimed invention would have been obvious." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

2. Petitioner Fails to Establish that Its Secondary References Cure the Deficiencies In De Oliveira

As noted above, Petitioner relies on its secondary references solely with respect to the use of benzovindiflupyr as an SDHI. It does not rely on them to supplement De Oliveira's at least six other material shortcomings, enumerated above. *See supra* IV.A. Petitioner therefore does not meet its burden to establish obviousness. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 161 (Fed. Cir. 2021). Petitioner fails, moreover, to establish from its secondary references—which it addresses seriatim rather than collectively—a reason to modify De Oliveira to substitute benzovindiflupyr for De Oliveira's preferred SDHIs. EX2020, ¶¶237-238.

a. Petitioner Has Not Established Wiglesworth Teaches Benzovindiflupyr Combinations for Treatment of Soybean Rust

Petitioner asserts "Wiglesworth discloses that benzovindiflupyr [which] is a new SDHI fungicide… is 'extremely efficacious on soybean rust.'"[24] Pet., 53 (quoting EX1008, 11-12); EX2020, ¶225. Based on this, Petitioner argues that "A POSA would have combined benzovindiflupyr with any of the fungicidal combinations disclosed in De Oliveira as A(2), B(2), C(2) or D(2) to improve control of soybean rust." Pet., 53.

Petitioner misses the fact that Wiglesworth, at most, only promotes benzovindiflupyr *alone* (as "Solatenol") for soybean rust. EX1008, 12. It provides no teaching, suggestion, or motivation to use benzovindiflupyr in combination with any other component for this application. EX2020, ¶¶225-228. As Dr. Brannen testified, a POSA would not have assumed that all different fungicides are suitable or compatible for use as a mixed combination. EX2021, 33:8-34:6, 35:15-36:11, 36:18-37:13, 38:14-39:15, 40:19-41:5, 42:12-17; EX2020, ¶4.

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[24] Benzovindiflupyr was not new and had even been patented and commercialized by Petitioner. *See* EX1011, 12-13 ("First sold in Paraguay in 2012;" citing US 7,732,469 EX2029 filed Oct. 23, 2006).

Even as a stand-alone treatment, Wiglesworth would not have motivated a POSA to substitute benzovindiflupyr for or combine with another treatment as it provides no specific evidence on which a POSA could rely regarding benzovindiflupyr's activity. EX2020, ¶227. Nor does Wiglesworth provide any basis for selecting benzovindiflupyr over the SDHIs listed in and preferred by De Oliveira. EX2020, ¶228. With respect to other SDHIs, Wiglesworth discloses no more than that "baseline sensitivity studies are underway to determine specific cross-resistance with other SDHIs currently on the market." EX1008, 12.

Instead of teaching benzovindiflupyr *combinations* for soybean rust (*cf.* Pet., 53), Wiglesworth teaches benzovindiflupyr combinations only for other crops (e.g., peanuts, cucurbits) and different diseases (e.g., early leafspots, peanut rust, powdery mildew). *See*, *e.g.*, EX1008, 11; EX2020, ¶228. This contradicts Petitioner's argument based on Wiglesworth that "[a] POSA would have combined benzovindiflupyr with any of the fungicidal combinations disclosed in De Oliveira as A(2), B(2), C(2) or D(2) ***to improve control of soybean rust***." Pet., 53.

That Wiglesworth only promotes benzovindiflupyr *alone* for soybean rust and only promotes benzovindiflupyr *combinations* for other applications further contradicts Petitioner's assertion that "a POSA would have been further motivated to combine benzovindiflupyr with [De Oliveira] A(2) specifically since Wiglesworth discloses combining benzovindiflupyr with azoxystrobin." Pet., 53. Wiglesworth

provides no basis for benzovindiflupyr adding any benefit to De Oliveira A(2), which already contains three components and provides a high level of control for soybean rust. EX1007, p.24-26; EX2020, ¶228. Such combinations would also have been contrary to the Elatus® (benzovindiflupyr+azocystrobin), which taught away from mixtures with other fungicides. EX1009, EX2021, 31:7-14 (agreeing "a person of ordinary skill in the art would have relied upon" the label), 38:14-39:15 (no compatible fungicides identified).

Thus, Petitioner has not provided any rationale for why a POSA would have been motivated to override De Oliveira's preferred SDHIs in favor of benzovindiflupyr, to ignore Wiglesworth's disclosure that benzovindiflupyr is by itself "extremely efficacious on soybean rust" and that combinations are directed to other applications or modify specific De Oliveira formulations to add benzovindiflupyr. EX2020, ¶¶225-228.

b. Petitioner Has Not Established a POSA Would Make Benzovindiflupyr Combinations in View of Tobler

Petitioner asserts that obviousness over De Oliveira "is further supported by Tobler which discloses that benzovindiflupyr (compound A-1.1) is highly effective at controlling Phakopsora pachyrhizi (Asian soybean rust)." Pet., 53. That benzovindiflupyr is effective for soybean rust might be motivation to use it alone (as

Wiglesworth describes for soybean rust) or maybe even in sequence for this purpose, does not even purport to support mixed combinations. EX2020, ¶228, 229-233.

If anything, Tobler would discourage a POSA from using benzovindiflupyr in controlling Asian soybean rust. EX2020, ¶¶229-233. For example, Tobler conducted a test described in Table B1 to measure percent control for soybean rust for three different compounds, one of which was compound A-1.1 (benzovindiflupyr). EX1006, 41:20, Table B1. At the most effective dose tested, fungal control with alternative SDHI Compounds A-1.2 or A-1.3 was considerably higher. Thus, a POSA reading Tobler would be taught, if anything, that Compounds A-1.2 or A-1.3 are better SDHIs for controlling Asian soybean rust. EX2020, ¶¶229-230.

Indeed, as Dr. Brannen testified, mixing was more expensive and contrary to standard recommendations to sequentially rotate—not combine—fungicides with different mechanisms of action to reduce the risk of resistance. EX2021, 12:8-13:7, 14:14-16:3, 16:22-18:7, 21:9-23:8; EX2015. Motivation to combine as a mixture based on Tobler's disclosure that benzovindiflupyr is effective for soybean rust is also inconsistent with Dr. Brannen's testimony that a POSA would need guidance on compatibility to make mixed combinations. EX2021, 33:8-34:6, 35:15-38:11; EX2020, ¶¶231-233.

Given that Tobler does not disclose the claimed combination (*supra* §V.A.1) and recognizing that it would have been contrary to practice to arbitrarily mix fungicides, Petitioner has not established a POSA would be motivated to modify De Oliveira with Tobler to make undisclosed combinations.

c. Petitioner Has Not Established That Godoy Supports Using Benzovindiflupyr in a Claimed Three-Component Combination

Petitioner asserts "Godoy provides additional motivation as there are a limited number 'main modes' of action for controlling disease in soybeans, and further illustrates that such combinations are effective thereby establishing a reasonable expectation of success" (Pet., 54). EX2020, ¶234. Patent Owner disagrees.

First, Petitioner's characterization of Godoy based on modes of action does not establish a motivation to modify De Oliveira. As De Oliveira discloses 16 preferred SDHIs that operate by the same mode of action, Godoy does not provide a motivation to use a *different* SDHI instead of a De Oliveira preferred SDHI. Even if using different modes of action, arbitrarily mixing them together is contrary to Dr. Brannen's testimony regarding the preferences for sequential treatments over more expensive mixtures and the need for guidance on mixture compatibility. EX2021, 12:8-13:7, 14:14-16:3, 16:22-18:7, 21:9-23:8, 33:8-34:6, 35:15-38:11; EX2015; EX2020, ¶¶235-236.

Second, as discussed above (*supra* V.A), Godoy was not shown to be prior art and does not teach or suggest claimed 3-component combinations that meet the "consisting of" or "combination" limitations.

Thus, Petitioner has not established a POSA would be motivated to modify De Oliveira with Godoy to make the undisclosed combinations.

d. Petitioner Fails to Address The "Consisting Of" Limitation

As discussed above (*supra* §IV.C, V.A.2.a, VI.A.3), Petitioner failed to address that De Oliveira, Wiglesworth, Tobler, and Godoy use or allow for components outside of the scope of the claims. EX2020, ¶¶115-132, 153, 221. Petitioner provides no rationale for why a POSA would combine these references to meet the claimed "consisting of" limitation. EX2020, ¶¶224-238; *CIAS, Inc. v. Alliance Gaming Corp*., 504 F.3d 1356, 1361 (Fed. Cir. 2007); *Norian Corp. v. Stryker Corp*., 363 F.3d 1321, 1331 (Fed. Cir. 2004).

e. Petitioner Fails to Address The "Combination" Limitation

As discussed above (*supra* §IV.B, V.A.2.b, VI.A.2), Petitioner has not addressed that De Oliveira, Wiglesworth, Tobler, and Godoy do not require three-component fungicides be applied together as a mixed combination. EX2020, ¶¶91-114, 148-150, 212. Likewise, Petitioner provides no rationale for why a POSA would combine these references to reach the claimed "combination" limitation.

EX2020, ¶¶224-238. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 161 (Fed. Cir. 2021) ("Given neither [reference] teaches or suggests [claim limitation], we fail to see why a skilled artisan would opt to entirely [to include claim limitation] when combining these references.").

3. Petitioner Has Not Established Obviousness of Four-Component Combinations of Claim 2

Petitioner asserts "De Oliveira, optionally in view of Wiglesworth, Tobler, and Godoy render obvious [4-component combinations]." Pet., 55. But like Petitioner's other obviousness contentions involving De Oliveira, Petitioner's proposed combinations all incorporate benzovindiflupyr, which De Oliveira does not teach. *Supra* §IV.B.2. Wiglesworth, Tobler, and Godoy still do not remedy this defect for a 4-component combination. Moreover, nothing in the disclosures teaches the "consisting of" or "combination" limitations, a point Petitioner again failed to address.

For this and the same reasons as discussed above (*supra* § IV.B.2), Petitioner fails to establish De Oliveira renders claim 2 obvious. EX2020, ¶¶185-194.

4. Petitioner Has Not Established Any of the Dependent Claims are Obvious

Petitioner only provides conclusory arguments for why it contends dependent claims 3, 4, 6, 7, 8, and 9 are obvious. Pet., 56-57, 59-61. And Petitioner's declarant, Dr. Brannen, merely parrots the Petition's conclusory assertions. *Compare* EX1003,

¶¶209-215, 221-245 with Pet., 53-54; *Xerox*, IPR2022-00624, Paper 9 at 15. For these reasons and those above addressing the independent claims as well as in Ground 2B (Section V.B.4, above), Petitioner has not met its burden to establish any dependent claim is obvious.

VII. OBJECTIVE INDICIA SUPPORT A NONOBVIOUSNESS FINDING

Petitioner's already weak and incomplete obviousness arguments are further undercut by objective evidence of nonobviousness that "must be considered in every case where present." *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc). Notably, particularly strong evidence of unexpected synergetic effects is reflected in data from Petitioner's own experiments that it sought to withhold until ordered by the Board. *See* EX3002, EX3003, EX3004; Paper 22; Paper 27; *Spectrum v. Longhorn*, IPR2021-00847, Paper 107 (PTAB May 3, 2023). This and other evidence objectively demonstrate nonobviousness. EX2020, ¶¶239, 240-244, 245-272, 273-277.

A. Long-Felt But Unmet Need

As Dr. Jacobsen explains, there was a long-felt but unresolved need for the improved control of Asian soybean rust, which was hugely problematic and costly to commercial farmers. EX2020, ¶¶2-3, 273-274; EX1006, 1:21-39; EX1007, p.1 ("Soybean rust caused by Phakopsora pachyrhizi is the most damaging disease affecting the yield of leguminous plants causing widespread damage to crops and

depleting yield from 10 to 90% if not treated in time."), p.2 ("[T]here is need for a method of treatment that demonstrates improved yields along with preventive and/or curative capabilities in the treatment of Soybean Rust."); EX2037/2038 (Mitrion® Marketing Materials). The claimed invention met this need, as confirmed and corroborated in Petitioner's marketing of prothioconazole + benzovindiflupyr + mancozeb (based on the addition of mancozeb to its Mitrion® product and development a ready-mix product of all three components[25] for greater control of Asian soybean rust. *Id.* ("**Mitrion™** should be applied… always in combination with multi-site applications (Bravonil or Mancozeb)."); EX2020, ¶¶275-277. [redacted] further reflects that the claimed combinations meet the need for improved control of Asian soybean rust. EX2020, ¶¶245-272. Petitioner's promotion of Mitrion™ with mancozeb and development of a claimed three-component combination and its inconsistent arguments to obtain allowance of Tobler is further evidence of nonobviousness and Petitioner's hypocritical positions. *See WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1336 (Fed. Cir. 2016) ("The fact that a competitor copied technology suggests it would not have been obvious."); EX2034, 6; Section V.A.1, above.

[25] Identified in EX1020 as treatment A9, with a A10 ready mix version of all three components that is under development by Petitioner. EX2018, 64:15-66:11,

B. Unexpected Results

Contrary to Petitioner's characterizations,[26] testing described in EX1020 *shows unexpected and synergistic improvements* [redacted] At the outset, Petitioner's data shows that claimed combinations it tested [redacted] EX2020, ¶¶246-249.

[redacted]

EX2020, ¶247 (citing EX1031, 2-5, 6-10, EX1032, 1-3, and EX1033 1-2, 9-10), Appendix B at 1-2, 5-9, 12-13, 16-20, 23-24, 27-31, 34-35, 39-43, 46-47, 50, 52-53, 56, 58-59, 62, 64-65, 68, 71-72, 75, 77-78, 81, 83-84, 87, 89-90, 91. These improvements would have been considered substantial and unexpected by a POSA

[26] EX2019, 10:6-14 (Petitioner representing to the Board that "defoliation and yield [data]… it doesn't support – it's not helpful to Patent Owner").

and establish nonobviousness on their own. EX2020, ¶272. Further, Petitioner's experiments show that the claimed combinations [redacted]. EX1031, 3, 4, 5, 10.

While the "Colby" equation has inherent limitations and the absence of synergy by Colby is not indicative of an absence of synergy, Petitioner's field tests also consistently resulted [redacted] (EX2020, ¶¶241-246, 253-272).[27]

For instance, Colby ratios calculated from Petitioner's results for yield [redacted].

[27] As Dr. Jacobsen explains, for independent modes of action, a Colby ratio (measured/expected) greater than 1.0 indicates synergy. Petitioner's tested combinations, however, having overlapping modes of action such that Colby equation would overstate the synergy threshold. EX2020, ¶¶250-251. In cases of overlapping modes of action, lower Colby ratios, (e.g., 0.9), would represent synergy. EX2020, ¶¶244 (citing EX2057, EX2058, EX2060), 250-252.

[redacted]

EX2020, ¶¶254-255 Appendix B at 1-11; EX1033, 1.

[redacted]

[28] As used herein, Colby ratios greater than 0.9 have green highlights; values between 0.8 and 0.9 have yellow highlights; and values below 0.8 have red highlights.

EX2020, ¶¶254-255, Appendix B at 12-22; EX1033, 9. Since yield is ultimately the most important parameter, [redacted] is particularly strong evidence of nonobviousness. EX2021, 135:5-14; EX2020, ¶253.

Additionally, foliage retention (inverse of measured defoliation) demonstrated [redacted]

[redacted]

EX2020, ¶¶256-257, Appendix B at 23-33; EX1033, 2.

Likewise, week-by-week disease severity[29] Colby ratios [redacted]

[29] Data shown starts with the time point where control disease severity was at least 5/100. EX2020, ¶¶258-259.

EX2020, ¶¶258-259 (areas with late onset disease noted in red); EX1031, 2-5; Appendix B at 46-70.

EX2020, ¶¶258-259 (areas with late onset disease noted in red), Appendix B at 71-95; EX1031, 7-10; EX1032, 1-3.

It is notable that [redacted] As Dr. Jacobsen explains, due to the late and limited time course considered, results from these late-onset areas are not reflective of an absence of synergy. EX2020, ¶260 [redacted].

As Dr. Jacobsen explains, week-by-week disease severity analysis above is most appropriate for the data that varies in terms of disease onset and duration. EX2020, ¶258. By contrast, the presentation of Colby results in EX1020 as single data points that combine all time points and areas for each treatment is unreliable at least because (i) despite representations that Dr. Prates gathered data at 7-day intervals for 56 days[30] (EX2018, 43:7-15), he relied on [redacted]

[30] Petitioner has not produced data for [redacted]

(ranging from 35 days to 49 days) (EX2035, 1, 7)), (ii) Dr. Prates selectively excluded collected data [redacted] (iii) [redacted] EX2020, ¶¶258, 261-267.

But despite problems with using average disease severity data, [redacted]

[redacted]

[redacted] Petitioner represents "it is not information [Dr. Prates] relied on. EX2035, 7. Nevertheless, Petitioner has represented it has "produced all severity data for the days that were collected." EX2035, 1.

[31] Petitioner only reports final Colby values in EX1020; but it appears Dr. Prates calculated Colby averages differently between A-formulations (calculating Colby then averaging) and B-formulations (averaging then calculating Colby). EX2020, ¶¶268-270. The former is the way a POSA would calculate Colby averages and demonstrates greater synergy. *Id.*

[redacted]

EX2020, ¶¶270-271, Appendix B at 70, 95.

Thus, Petitioners' data as a whole show strong synergistic effects for the claimed combinations and demonstrates that the claimed invention is objectively nonobvious under every metric. EX2020, ¶272.

VIII. PETITIONER FAILS TO ESTABLISH LACK OF WRITTEN DESCRIPTION OR NONENABLEMENT [GROUNDS 4-5]

Petitioner's written description (Ground 4) and enablement (Ground 5) challenges are commonly premised on reading in a limitation of "enhanced efficacy and synergy" based on objective evidence of nonobviousness addressed during

prosecution. Pet., 73-75, 78; EX2020, ¶¶37-40, 278-287; 288-296. However, as the Board recognized, "'enhanced efficacy and synergy' is not a claimed limitation." ID, 22. Indeed, Petitioner acknowledges the Patent Owner "did not add this patentable distinction to their claims."[32] Pet., 74. Petitioner, thus, misapprehends the written description and enablement standards—and fails to establish unpatentability—as neither requires disclosure of unclaimed elements. *Lochner Techs., LLC v. Vizio, Inc.*, 567 F. App'x 931, 935 (Fed. Cir. 2014)("There is no precedent requiring a patentee to disclose or enable unclaimed elements."); *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1333 (Fed. Cir. 2003) ("Precedent [requires] the patentee need only describe the invention as claimed."). Petitioner's §112 grounds are also [redacted].

[32] Petitioner also did not seek to construe the claim as requiring of "enhanced efficacy and synergy." *See* §VII. Nor would there have been basis to read this in from any unmistakable disavowal of claim scope during prosecution. *Cf.* Pet., 74. As the Board recognized, Petitioner's prosecution history argument is directed to an "[in]complete sentence" where "it is unclear what this language actually means." ID, 20 (*citing Genuine Enabling Tech. LLC v. Nintendo Co., Ltd.*, 29 F.4th 1365, 1374 (Fed. Cir. 2022); EX2020, ¶283.

EX2018, 22:19-23:17; *see Allergan, Inc. v. Sandoz, Inc.*, 796 F.3d 1293, 1310 (Fed. Cir. 2015) ("[T]he enablement inquiry turns on whether the skilled artisan, ***after reading the specification***, would be able to make and use the claimed invention without undue experimentation.").

A. Petitioner's Written Description Ground is Wrong as a Matter of Law

Petitioner does not dispute that the '727 patent describes the claimed fungicidal combinations, compositions, and methods of use, including with textual description and working embodiments. EX1001, 3:11-4:19, 6:19-48, 7:40-8:30; *see also* Pet., 73-75; *supra*, § II.A. To the contrary, ***Petitioner admits***, *inter alia,* that:

1. "The '727 specification provides disease control test data for three different two fungicide combinations (Table 1) and a fourth with a three fungicide combination as the control. Specifically, each of the combinations contains prothioconazole combined with another fungicide. Data is then provided for the same combinations with the addition of mancozeb. The four test combinations each contain prothioconazole, mancozeb, and either benzovindiflupyr, isopyrazam, penthiopyrad, or azoxystrobin." Pet., 7-8.

2. "Benzovindifluyr, isopyrazam, and penthiopyrad are identified as succinate dehydrogenase inhibitor fungicides; and azoxystrobin is identified as a quinone outside inhibitor fungicide. Ex. 1001, 6:49-51, 7:41-43, and 8:33-35. The results of these tests for the addition of mancozeb on the mixtures is described in Table 1 of the '727." *Id.*, 8 (typographical error in original).

3. "[T]he specification notes that '[t]able 1 clearly demonstrates the increase in

> control when mancozeb is added to the combination of ergosterol biosynthesis inhibitors and succinate dehydrogenase inhibitor fungicides.' Ex. 1001 20:60-63. 'Table 2 demonstrates efficacy when mancozeb is added to the combinations of succinate dehydrogenase inhibitor fungicides and quinone outside inhibitor fungicides and ergosterol biosynthesis fungicides.' Ex. 1001 20:64-67." *Id.*, 9-10.

These undisputed disclosures demonstrate objective possession of the claimed invention. "That is all that the written description requirement demands." *Alcon Res. Ltd. v. Barr Laboratories, Inc.*, 745 F.3d 1180, 1191 (Fed. Cir. 2014); *Ariad Pharm., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*).

Ignoring the legal standard and what is actually claimed, Petitioner mischaracterizes the claimed subject matter as "***not*** directed at the combination of fungicidal ingredients, but rather to the alleged synergistic interaction between them." Pet., 74. This is demonstrably false, as the claim language defines the scope of the invention. EX1001, claim 1 ("A ***fungicidal combination*** consisting of"), claim 5 ("A ***composition consisting*** of"), claim 10 ("A ***method*** of controlling fungal diseases in plants consisting of, ***applying*** to the locus of the plant a ***combination*** consisting of").

Conflating the written description with objective indicia of non-obviousness, Petitioner's focus on whether there is description of unclaimed "synergy based on the material presented by UPL in Tables 1 or 2." Pet., 73-75. But there is no "logical

support for" Petitioner's premise that objective indicia must be disclosed in the specification. *In re Chu*, 66 F.3d 292, 299 (Fed. Cir. 1995). Indeed, the law is clear that ***"[u]nclaimed subject matter is not subject to the disclosure requirements of § 112***; the reasons are pragmatic: the disclosure would be boundless, and the pitfalls endless." *Engel Indus., Inc. v. Lockformer Co.*, 946 F.2d 1528, (Fed. Cir. 1991).

The cases cited by Petitioner say nothing to the contrary. Pet., 74-75; *see, e.g.*, *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 953 (Fed. Cir. 2007) (addressing written description of a means-plus-function claim and stating that "[t]he inquiry is whether one of skill in the art would understand the specification itself to disclose a structure, not simply whether that person would be capable of implementing a structure"); *Juno Therapeutics, Inc. v. Kite Pharma, Inc.*, 10 F.4th 1330, 1335 (Fed. Cir. 2021) (discussing written description support for pharmaceutical genus claims under § 112); *Ariad*, 598 F.3d at 1351 ("[T]he test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.").

Next, Petitioner argues that "unexpected results" must be "much greater than predicted." Pet., 76. This again has no bearing on written description. *See Singh v. Brake*, 317 F.3d 1334, 1346 (Fed. Cir. 2003). Confirming that Petitioner is

conflating separate legal questions, the cases cited by Petitioner all address obviousness, not the requirements of § 112. *Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 808 (Fed. Cir. 1989) (discussing § 103 and not § 112); *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976) (same); *Millennium Pharmaceuticals, Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1368 (Fed. Cir. 2017) (discussing objective indicia of nonobviousness in the context of § 103).

Accordingly, Petitioner's arguments are misdirected to unclaimed synergies and fail to support even a threshold showing of unpatentability for lack of written description.

B. Petitioner's Enablement Ground is Wrong as a Matter of Law

Like its flawed attack on written description, Petitioner's enablement ground is premised on the misapprehension that the specification must enable unclaimed "enhanced efficacy and synergy" or "enhanced greening." Pet., 78. This fundamental error infects all of Petitioner's scatter-shot allegations. Ground 5 of the Petition thus lacks merit for all the same reasons as Ground 4. *Supra*, §VII.A.

More specifically, Petitioner's argument fails from the start as there is no requirement that a patent enable how to make and use *unclaimed* features, e.g., "enhanced efficacy and synergy" or "enhanced greening." *See, e.g.*, *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA*, 617 F.3d 1296, 1307

(Fed. Cir. 2010); *Lochner Technologies, LLC v. Vizio, Inc.*, 567 F. App'x. 931, 935 (Fed. Cir. 2014).

Petitioner argues that "one fact which weighs highly in favor of a lack of enabled [*sic*, enablement] is that the data presented in the '727 patent is unclear as it confusingly refers to g/ml/ha." Pet., 77. As an initial matter, there is no basis for Petitioner to argue that the exemplary data in the '727 patent are needed to enable a POSA to make and use the claimed invention, *e.g.*, combinations of the claimed fungicides. Further, the Petition's allegation of "confusi[on]" is unsupported attorney argument entitled to no weight. *In re Magnum Oil Tools*, 829 F.3d at 1380; *see also In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997). It is also contradicted by Petitioner's expert's understanding of the Elatus® label "confusingly" referring to units of "15 percent pounds" as an apparent typo. *See* EX1009, pg.1; EX2021, 27:12-31:9.

Assuming Petitioner is addressing the "ml/g/ha" heading in Table 1—though the Petition does say—its conclusory attorney argument makes no reference to having considered the specification clearly disclosing the dose rates at which treatments were applied in units of grams per hectare (e.g., 1500 g/ha or 200 g/ha)

or milliliter per hectare (e.g., 150 ml/ha), depending on the fungicide:

Studies were conducted to study the addition of dithiocarbamate fungicides to succinate dehydrogenase inhibitor fungicides and at least one other fungicide and the contribution of the dithiocarbamate to the efficacy of these mixtures. Experiments were conducted over a period of two years to study the effect of the addition of dithiocarbamates on the efficacy of succinate dehydrogenase inhibitors alone and when combined with a co-fungicide such as a Quinone outside inhibitors and/or ergosterol biosynthesis inhibitor fungicide. Doses tested were at rates of 1500 g/ha for Mancozeb, 150 ml/ha for the ergosterol biosynthesis inhibitor, 200 g/ha for the Quinone outside inhibitor, 1000 g/ha and 200 g/ha for succinate dehydrogenase inhibitor fungicides. The combinatios were tested for efficacy of disease control in soybean for the control of Asian soybean rust. The trials were carried out at various locations in India.

Treatment	Dose rates (ml/g/ha)
Prothioconazole + Benzovindiflupyr	150 + 200
Prothioconazole + Benzovindiflupyr + Mancozeb	150 + 200 + 1500

EX1001, 20:17-49 (highlighting added). The Petition's attorney argument is not credible to establish any ambiguity in the dose rates listed in the tables of Examples 1 and 2, i.e., dose rates expressed as gram or ml (g/ml) per hectare (g/ml/ha). *Id.*, 20:26-21:11.

Next, Petitioner argues that the data in the '727 patent do not allow "one to predict the impact of different ratios of fungicides." Pet., 77. Again, "there is no precedent requiring a patentee to disclose or enable unclaimed elements." *Lochner*, 567 F. App'x. at 935.

Petitioner potentially implies that the '727 patent lacks a practical utility and thus does not teach one how to use the invention. Pet., 78. Petitioner is wrong. The '727 patent details general and specific uses of the claimed fungicidal combinations. EX1001, 17:1-19:36. For example, the specification states that the disclosed fungicidal combinations are useful "for controlling a broad spectrum of fungicidal

diseases." *Id.*, 1:1-18. The specification additionally discloses specific plant diseases that fungicidal compositions may be used to treat, along with exemplary crops to which the fungicidal combinations may be applied. *Id.*, 17:1- 19:36. Petitioner has not provided any legitimate reason to question the '727 patent's credible disclosures of how to use the invention. Pet., 76-80. *See In re Brana*, 51 F.3d 1560, 165-66 (Fed. Cir. 1995).

In fact, *Petitioner's evidence establishes utility*. Specifically, although Petitioner argues that it did not observe *synergy* in its own field trial (Pet., 80-81), its own data shows [redacted] (*e.g.*, EX1020, 5). As such, and Petitioner's evidence shows that the claimed fungicidal combinations have a practical utility.

IX. CONCLUSION

For these reasons, Petitioner has failed to prove by a preponderance of the evidence that any challenged claim is unpatentable for lack of anticipation, obviousness, written description, or enablement. The Board should find that claims 1-10 of the '727 patent are not unpatentable.

Respectfully Submitted

Dated: November 9, 2023

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Patent Owner's Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1), because it contains 17,882 words, according to the word-processing system used to prepare this response, excluding the words in the Table of Contents, Table of Authorities, Certification Under § 42.24(d), and Certificate of Service, as set forth in 37 C.F.R. § 42.24(a)(1).

Respectfully Submitted

Dated: November 9, 2023

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CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Patent Owner's Response** was served electronically via email on November 9, 2023, in its entirety on the following:

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