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 PRELIMINARY RESPONSE

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Table of Patent Owner's Exhibits

Ex. No.	Description
2001	M. Bravo de Souza and R. Luiza Vidal, "Fungicidas Protetores e Sistemicos no Controle de *Corynespora cassiicola* em Soja," *Revista de Agricultura Neotropical*, v. 5, n. 3, p. 65-69, jul./set. 2018
2002	Certified translation of EX2001, M. Bravo de Souza and R. Luiza Vidal, "Protective and Systemic Fungicides in the Management of *Corynespora cassiicola* in Soybeans," *Neotropical Agriculture Journal*, v. 5, n. 3, p. 65-69, Jul./Sep. 2018 ("de Souza")
2003	Nimbus WG Fungicide/Miticide Product Label, APVMA Approval No. 68631/114843
2004	Australian Pesticides and Veterinary Medicines Authority registration information for Nimbus WG Fungicide, Product No. 68631
2005	Ficha de Datos de Seguridad, Nimbus
2006	Certified translation of EX2005, Safety Data Sheet for Nimbus
2007	Ministerio de Agricultura, Pesca Y Alimentación registration information for Nimbus, Registration No. 24412
2008	Certified translation of EX2007, Ministry of Agriculture, Fisheries, and Food registration information for Nimbus, Registration No. 24412
2009	Ficha Tecnica IQV Agro Portugal, Nimbus, Provisional marketing Authorization No. 3814
2010	Certified translation of EX2009, Data Sheet for IQV Agro Portugal for Nimbus, Provisional Marketing Authorization No. 3814
2011	U.S. Patent Publication No. 2010/0216640
2012	U.S. Patent Publication No. 2015/0181870 ("Kemmitt")
2013	EP 2 783 569 A1 ("Grammenos")

I. Introduction

The challenged claims of U.S. Patent No. 11,445,727 ("'727 patent") recite novel and inventive fungicidal combinations consisting of benzovindiflupyr, mancozeb, and at least one of an ergosterol biosynthesis inhibitor and/or a quinone outside inhibitor. Although Petitioner asserts six grounds of anticipation and obviousness by making alternative combinations and permutations of four references and further asserts grounds based on written description and enablement, Petitioner failed to establish that any claim of the '727 patent is more likely than not unpatentable under any ground.

Ground 1 is defective from the start for relying on a "Technical Circular" ("Godoy," EX1004, EX1005) as allegedly anticipatory without establishing that it is printed publication prior art. The sole basis for Petitioner's assertion that Godoy was accessible prior art is the conclusory "opinion" of its declarant (Dr. Hall-Ellis)—an opinion that is not based on personal knowledge and thus cannot establish its publication date or availability in the prior art. The Board has repeatedly so held, both in general and with respect to similar "opinion" testimony from Dr. Hall-Ellis specifically in other proceedings. Even if it were established to be prior art, Godoy fails to teach any narrowly claimed "combination" "consisting of" the required fungicides.

Ground 2—which is really one ground of anticipation (Tobler (EX1006)) and two grounds of obviousness (Tobler alone, Tobler + Godoy)—also fails, as Petitioner did not make a threshold showing of unpatentability. Petitioner failed to show that Tobler, which was considered during prosecution, (a) anticipates, (b) renders obvious, or (c) renders obvious in combination with Godoy any claimed fungicidal combination. Indeed, Petitioner relies on a Tobler embodiment that encompasses a genus of some 30,000 potential combinations yet fails to address the scope of this exceedingly large genus or identify any purported bases for a skilled artisan to have made selections therein. Petitioner's declarant fails to bolster its arguments, as he merely repeats the Petition's conclusory and unsupported arguments. As such, Petitioner shows no error in the Examiner allowing the claims after considering Tobler.

Ground 3—again actually multiple grounds—rests on De Oliveira (EX1007), which was extensively considered and overcome during prosecution. Petitioner failed to show the Examiner materially erred when considering De Oliveira, and further failed to show that De Oliveira discloses or renders obvious any claim, either alone or in combination with any (or all) of its multitude of "optional" secondary references. As with Ground 2, Petitioner's declarant does not save Ground 3, as he again parrots the Petition's conclusory assertions without additional support or technical reasoning. As the Examiner correctly found, the art

of record—including De Oliveira specifically—did not fairly suggest a combination "consisting of" the claimed fungicidal combinations.

Last, Petitioner's tacked-on challenges to written description (Ground 4) and enablement (Ground 5) are premised on fundamentally misunderstanding Section 112. They are wrong as a matter of law. Petitioner first conflates the description and enablement of a claimed combination itself with objective indicia supporting non-obviousness. Petitioner then misconstrues the claims as being directed to unclaimed properties and argues about whether the '727 patent describes and enables these unclaimed properties. The invention, as claimed, is expressly described and amply enabled by the specification's detailed disclosures.

Institution should be thus denied under 35 U.S.C. § 324(a) based on the futility of the Petition's unduly multiplicative grounds and under 35 U.S.C. § 325(d) for rehashing arguments previously considered, without error, by the Office.

II. The '727 Patent

A. The '727 Patent Discloses Novel Fungicidal Combinations with Unexpected Advantages

The '727 patent discloses novel and inventive fungicidal combinations consisting of (1) a dithiocarbamate fungicide (e.g., mancozeb), (2) a succinate dehydrogenase inhibitor (e.g., benzovindiflupyr), and at least one of (3) an ergosterol biosynthesis inhibitor and/or (4) a quinone outside inhibitor. As

explained in the specification, the disclosed combinations exhibited surprising and unexpected advantages, including enhanced efficacy and a reduction in fungal disease incidence. EX1001, 3:11-25. The ’727 patent additionally discloses that, by applying during the flowering stage of the crop, the fungicidal combinations delayed senescence (deterioration caused by aging) and increased crop yield. *Id.*, 3:25-31.

The ’727 patent discloses that in one embodiment, the ergosterol biosynthesis inhibitor may be selected from the group consisting of azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, penconazole, propiconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, prothioconazole, imazalil, oxpoconazole, pefurazoate, prochloraz, triflumizole, fenarimol, nuarimol, pyrifenox, pyrisoxazole, triforine and mixtures thereof. EX1001, 7:25-34.

The ’727 patent further discloses that in one embodiment, the quinone outside inhibitor may be selected from azoxystrobin, coumoxystrobin, enoxastrobin, flufenoxystrobin, picoxystrobin, pyraoxystrobin, mandestrobin, pyraclostrobin, pyrametostrobin, triclopyricarb, kresoxim-methyl, dimoxystrobin,

fenaminostrobin, metominostrobin, trifloxystrobin, famoxadone, fluoxastrobin, fenamidone, pyribencarb and mixtures thereof. *Id.*, 7:38-45.

The ’727 patent also discloses preferred fungicidal combinations, including combinations consisting of (1) mancozeb and (2) benzovindiflupyr and (3) cyproconazole, difenoconazole, epoxiconazole, hexaconazole, tebuconazole, tetraconazole, or prothioconazole and/or (4) azoxystrobin, picoxystrobin, pyraclostrobin, kresoxim-methyl, or trifloxystrobin. EX1001, 7:43-8:30.

The ’727 patent explains that the amount of the fungicidal compositions will depend on various factors, including the subject of the treatment (e.g., plants, soil, or seeds), the type of treatment (e.g., spraying, dusting, or seed dressing), the purpose of the treatment (e.g., prophylactic or therapeutic disease control), and application time. *Id.*, 15:49-56. The ’727 patent acknowledges that the amount of the combination to be applied “can be readily deduced by a skilled agronomist.” *Id.*, 15:56-58.

The ’727 patent also explains that in one embodiment, the composition of the invention may be tank mixed and sprayed, or alternatively be mixed with surfactants then sprayed. *Id.*, 16:16-19. The specification further explains that in an embodiment, the compositions may “typically” be produced by mixing the fungicides with an inert carrier and surfactants and other adjuvants and formulated

into “known formulation types,” including solid or liquid formulations. *Id.*, 16:23-32.

The ’727 patent identifies various plant diseases that the inventive compositions treat effectively, including diseases of soybean such as soybean rust. *Id.*, 17:1-18:67. The ’727 patent also exemplifies the activity of various fungicidal combinations for controlling Asian soybean rust in soybeans. 20:15-21:14.

B. Claims

The ’727 patent claims are directed to fungicidal combinations consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from an ergosterol biosynthesis inhibitor fungicide and/or a quinone outside inhibitor fungicide and related methods of use. Representative claim 1 recites:

> 1. A fungicidal combination consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from an ergosterol biosynthesis inhibitor fungicide, and a quinone outside inhibitor fungicide,
>
> wherein the ergosterol biosynthesis inhibitor is selected from azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, penconazole, propiconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, prothioconazole, imazalil, oxpoconazole,

pefurazoate, prochloraz, triflumizole, fenarimol, nuarimol, pyrifenox, pyrisoxazole, triforine, and mixtures thereof, and

wherein the quinone outside inhibitor fungicide is selected from azoxystrobin, coumoxystrobin, enoxastrobin, flufenoxystrobin, picoxystrobin, pyraoxystrobin, mandestrobin, pyraclostrobin, pyrametostrobin, triclopyricarb, kresoxim-methyl, dimoxystrobin, fenaminostrobin, metominostrobin, trifloxystro bin, famoxadone, fluoxastrobin, fenamidone, pyribencarb, and mixtures thereof.

EX1001, claim 1.

C. Effective Filing Date

The claims 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. *See* EX1002, 351-353 (disclosing combinations of benzovindiflupyr and mancozeb in combination with ergosterol biosynthesis inhibitors and/or quinone outside inhibitors); *id.*, 347-348 (listing ergosterol biosynthesis inhibitors and quinone outside inhibitors for use in the disclosed combinations and compositions). Petitioner did not challenge the November 4, 2016, effective filing date. Petition, 15-16 ("The effective filing date of all challenged claims 1-10 is no earlier than November 4, 2016.").

D. Prosecution History

The ’727 patent was filed as U.S. Application No. 16/347,283, which is a national phase entry of PCT/IB2017/056710, filed on October 30, 2017, and claims priority to IN ’704, filed on November 4, 2016. Prosecution from the time of national phase entry to issuance was extensive, ongoing for just short of five years.

1. August 21, 2020, Office Action

The Examiner initially rejected various pending claims (1) as anticipated by each of De Oliveira (WO 2015079334, EX1007), Foor (US 20080113979), and Gewehr (US 20090131462); (2) as obvious over Foor; (3) on the grounds of non-statutory double-patenting over the claims of U.S. Patent Nos. 10,694,744 and 10,362,782, and U.S. Patent Nos. 10,537,101 or 10,694,745 or 10,448,636 or co-pending U.S. application no. 16/785,313 in view of Gewehr; and (4) as failing to satisfy the written description and/or definiteness requirements of 35 U.S.C. § 112. EX1002, 201-220.

In the interest of brevity, the Examiner’s initial rejections are not detailed herein, as they concerned pending claims that were substantially broader than the issued claims. For example, original claim 1 recited: “A fungicidal combination comprising at least one succinate dehydrogenase inhibitor fungicide, at least one dithiocarbamate fungicide, and at least another fungicide.” EX1002, 478.

2. Response to August 21, 2020, Office Action

The Applicant amended the claims to require, *inter alia*, benzovindiflupyr, mancozeb, and at least one additional fungicide selected from an ergosterol biosynthesis inhibitor and a quinone outside inhibitor. EX1002, 190-192. The Applicant also cancelled certain claims and amended others in response to the Examiner's § 112 rejections. *Id.*, 190-194.

The Applicant explained that none of De Oliveira, Foor, and Gewehr anticipated the amended claims, as such publications neither disclosed benzovindiflupyr nor the fungicidal compositions recited in the amended claims. *Id.*, 195-196. The Applicant further explained that the amended claims would not have been obvious over Foor, including because Foor did not disclose benzovindiflupyr. *Id.*, 196. The Applicant deferred responding to the Examiner's double patenting rejections until the claims in the subject application were otherwise allowable. *Id.*, 197-198.

3. January 22, 2021, Office Action

The Examiner next rejected the pending claims as obvious over (1) Kemmitt (US 20150181870); (2) De Oliveira in view of Grammenos (EP 2783569); and (3) Gewehr in view of Kemmitt. *Id.*, 150-161. The Examiner also rejected the pending based on non-statutory double-patenting over the claims of U.S. Patent Nos. 10,694,744, 10,362,782, 10,537,101, 10,694,745, or 10,448,636 in view of

Kemmitt or co-pending U.S. application no. 16/785,313 in view of Kemmitt. *Id.*, 163-170. The Examiner further rejected pending claim 14 as indefinite under 35 U.S.C. § 112, asserting that the claimed ratio of "(1-80): (1-80) : (1-80) : (1-80)" was not clear, as the claim recited two constituents, and it was "not clear what 1:80 is referring to." *Id.*, 149.

The Examiner stated that Kemmitt teaches fungicidal combinations comprising a compound of Formula I (identified as: (3S,6S,7R,8R)-8-benzyl-3-(3-((isobutyryloxy)methoxy)-4-methoxypicolinamid-o)-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl isobutyrate) with at least one other fungicide selected from a list of strobilurins (e.g., azoxystrobin), succinate dehydrogenase inhibitors (e.g., benzovindiflupyr), and ergosterol biosynthesis inhibitors (e.g., prothioconazole), and a multi-side inhibitor (e.g., mancozeb). EX1002, 150-151. The Examiner determined that Kemmitt did not anticipate the claims but that it provided sufficient teaching for one of ordinary skill in the art to make and use the invention as claimed. *Id.*, 152.

In rejecting the pending claims over De Oliveira in view of Grammenos, the Examiner determined that De Oliveira teaches a method of treating soybean rust with mancozeb and a systemic fungicide, including a quinone outside inhibitor (e.g., azoxystrobin), where the method may further include a succinate dehydrogenase inhibitor, quinone inside inhibitor, and/or a demethylation inhibitor.

Id., 154. The Examiner noted that De Oliveira discloses "that a combination of a multisite contact fungicide, preferably a dithiocarbamate fungicide [e.g., mancozeb], along with a systemic fungicide selected from at least one Qo inhibitor (Quinone outside inhibitors), at least one Qi (quinone inside) inhibitor, at least one DM inhibitor (demethylation inhibitor) or at least one SDH inhibitor (succinate dehydrogenase inhibitors) leads to an unexpected and surprisingly good control of Soybean Rust as compared to other fungicides." *Id.* 154-155 (emphasis omitted). The Examiner further noted that De Oliveira did not disclose benzovindiflupyr as the succinate dehydrogenase inhibitor fungicide (SDHI). *Id.*, 155. The Examiner thus relied on Grammenos for its disclosure of benzovindiflupyr as "an effective fungicide of the group" of succinate dehydrogenase inhibitors. *Id.*, 157.

Next, the Examiner rejected the pending claims as obvious over Gewehr and Kemmitt. *Id.*, 158. According to the Examiner, Gewehr discloses fungicidal compositions comprising penthiopyrad and at least one other fungicide selected from a group that includes, *inter alia*, mancozeb and azoxystrobin. *Id.* The Examiner noted that while Gewehr does not disclose benzovindiflupyr, Kemmitt discloses that penthiopyrad and benzovindiflupyr "are two species of the same genus and alternatively usable." *Id.*, 160-161.

Finally, in the Examiner's nonstatutory double-patenting rejections, the Examiner combined the same set of patents and patent applications relied on in the

prior office action with Kemmitt, relying on Kemmitt principally for its disclosure of benzovindiflupyr. *Id.*, 162-170.

4. Response to January 22, 2021, Office Action

The Applicant submitted a Request for Continuing Examination (RCE) and amended the claims to recite combinations "consisting of" benzovindiflupyr, mancozeb, and at least another fungicide selected from a recited list of ergosterol biosynthesis inhibitors and/or a recited list of quinone outside inhibitors. EX1002, 132. The Applicant also amended claim 14 in response to the Examiner's § 112 rejection to clarify that "benzovindiflupyr and mancozeb are admixed in a ratio of 1:80 to 80:1." *Id.*, 134.

The Applicant then argued that the prior art did not render the amended claims obvious, as Kemmitt's fungicidal combinations required a component (3S,6S,7R,8R)-8-benzyl-3-(3-((isobutyryloxy)methoxy)-4-methoxypicolinamido)-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl isobutyrate (Formula I) excluded from the claims (*id.*, 137), that the combination of De Oliveira and Grammenos did "not fairly teach one skilled in the art to select and pick among numerous possibilities disclosed therein to arrive at the specific combination as set forth in the instant claims" (*id.*, 138), and that the combination of Gewehr and Kemmitt further required a fungicide (penthiopyrad or the fungicide of Formula I, respectively) excluded from the claims (*id.*, 139). The Applicant again deferred responding to

the Examiner's non-statutory double patenting arguments until the claims were otherwise allowable. *Id.*, 140.

5. June 14, 2021, Office Action and Notice of Allowance

The Examiner withdrew all rejections based on 35 U.S.C. §§ 103 and 112, finding the Applicants arguments were persuasive. EX1002, 97. The Examiner maintained the non-statutory double-patenting rejections. *Id.* 88-97.

The Applicant submitted a response explaining that the Examiner's double-patenting rejection based on a pending application "should be held in abeyance at least until the present claims are allowed" and the pending application had issued. *Id.*, 83-84. The Applicant further submitted a terminal disclaimer of the patent term extending beyond the issued patents relied on by the Examiner in its non-statutory double-patenting arguments. *Id.*, 76-78.

The Examiner issued a Notice of Allowability, finding that the references of record "do not recognize or fairly suggest a combination consisting of the [claimed] fungicides. In other words, the references teach compositions comprising fungicides that are excluded by the examined claims." *Id.*, 44.

III. Claim Construction

For the purposes of this preliminary response, UPL submits that all claim terms should have their plain and ordinary meaning as they would have been understood to a POSA in the context of the '727 patent. This includes the plain

meaning of the claim terms "fungicidal combination" and "combination" as requiring that the claimed fungicides be combined, i.e., together in a single mixture, e.g., mixed in a spray tank prior to application (referred to as "tank-mixed").

This is consistent with the plain meaning of the term "combination" as used 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." '727 patent, 20:54-60.

The '727 patent additionally equates combinations with fungicides "mixed with" one another, which is also consistent with the plain meaning of the term "combination." '727 patent, 21:15-20 ("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*** ergosterol biosynthesis inhibitors or quinone outside inhibitors. It was thus concluded that the addition of mancozeb enhanced the efficacy of the combination and surp[ri]singly gave a synergistic effect." (emphasis added)).[1]

[1] ***Bold italic*** indicates 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 a "combination" requires a combination of fungicides in a single mixture.[2] Petition, 18 ("the claims include the term composition or combination which are used interchangeably in the specification.") (citing EX1003, ¶76).

[2] 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. For example, the claimed "combination[s]" consist of fungicides, while the claimed "composition[s]" include "at least one agrochemically acceptable excipient." *E.g.*, '727 patent, claims 1, 5. The 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."), 16:23-25 ("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....").

IV. Grounds

A. Ground 1: Petitioner Failed to Show that Claims 1, 3-5, 7, 9, and 10 Are Anticipated by Godoy

1. Petitioner Failed to Make a Threshold Showing that Godoy Is Prior Art

Petitioner failed to meet its burden of establishing that Godoy (EX1004, EX1005) was sufficiently accessible to the public interested in the art prior to the November 4, 2016, effective filing date of the challenged claims.

As held by this Board, "the burden is on the petitioner to identify with particularity evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent, and therefore that there is a reasonable likelihood that it qualifies as a printed publication." *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 16 (Pat. Tr. & App. Bd. Dec. 20, 2019) (*precedential*). "To qualify as a printed publication, a reference 'must have been sufficiently accessible to the public interested in the art.'" *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (quotation omitted). "A reference will be considered publicly accessible if it was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it." *Id.* (quotation omitted). Petitioner failed to meet its burden under this standard.

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. Petitioner does not assert (much less establish) that Godoy is from an established publisher and bears copyright, printing, and ISBN dates. *Cf. Hulu,* IPR2018-01039, Paper 29 at 19-20. Instead, as its sole basis for public accessibility, Petitioner submitted a declaration by Dr. Sylvia Hall-Ellis stating her "opinion that Godoy report was available to the public on September 1, 2016." EX1019, ¶49. Her opinion, however, fails to establish that Godoy was publicly available and accessible in the prior art.

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. *Id.*, ¶¶47-49. Neither alleged fact is sufficient here. Notably, the Board has previously rejected even more detailed publication date testimony from Dr. Hall-Ellis herself as unfounded "speculation." *Unified Patents Inc. v. American GNC Corp.*, IPR2019-00505, Paper 31 at 14-16 (Pat. Tr. & App. Bd. July 19, 2019) (finding Dr. Hall-Ellis's publication date testimony "would be speculation" and holding Petitioner failed to establish the asserted reference constitutes 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 its website. *Id.*, ¶¶47-49. For example, even if "published" on some date by Embrapa—which appears to be an agricultural research corporation and not an established publisher—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 Fed. Appx. 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 even 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 simply an employee of an unrelated university whose similar unsupported declaration testimony on prior art status has been found not credible in multiple cases.

EX1019, ¶7; *Salesforce.Com, Inc. v. WSOU Investments, LLC*, IPR2022-00428, Paper 10 at 12-15 (Pat. Tr. & App. Bd. July 13, 2022); *Unified Patents*, IPR2019-00505, Paper 31 at 14-16.

Moreover, contrary to Dr. Hall-Ellis, the Embrapa website page attached to her declaration does not provide "a publication date of September 1, 2016." *Compare* EX1019, ¶47 *with id.*, 134-135 (Attachment 1b). 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 Attachment 1b at face value, the Embrapa website at most identifies the publication year as "2016." *Id.* 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. *See* EX1001, 1.

Second, Dr. Hall-Ellis has not established that Godoy was publicly accessible in the prior art. *See* EX1019, ¶47. Searching the internet for Godoy's ***title***—as Dr. Hall-Ellis did[3]—does not establish that Godoy could have been

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

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*, 815 F.3d at 1349 ("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 quotation omitted)); *Samsung Elecs. Co., Ltd. v. Infobridge Pte. Ltd.,* 929 F.3d 1363, 1372 (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."). 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, 133-134 (Attachment 1b) (showing header date of 1/23/23). Her years-later search for the title of Godoy cannot establish public accessibility *as of the critical date. See Blue Calypso*, 815 F.3d at 1349 ("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.").

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).

At bottom, Dr. Hall-Ellis's "opinion" on Godoy is no more than unsupported speculation and is entitled to no weight. *Topcon Medical Systems, Inc. v. Carl Zeiss Meditec, Inc.*, IPR2021-00452, Paper 14 at 18-20 (Pat. Tr. & App. Bd. 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 (Pat. Tr. & App. Bd. 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."). As in *Salesforce.Com*, "[t]o the extent Petitioner contends that Dr. Hall-Ellis has offered an 'opinion' about public accessibility," it is "insufficiently supported by record evidence to meet the 'reasonable likelihood' standard for institution." IPR2022-00428, Paper 10 at 14.

Notably, Dr. Hall-Ellis's conclusory "opinion" on Godoy's public accessibility contrasts sharply with the evidence she submitted to support other references. For example, to support her opinion on Gullino (EX1010), Dr. Hall-

Ellis cites records from the University of Wisconsin – Madison Libraries, Machine-Readable Cataloging ("MARC") records, and cataloging and indexing at the Library of Congress. EX1019, ¶¶50-59, Attachments 2a-2c. And yet for Godoy, Dr. Hall-Ellis submits only a certificate of translation dated January 5, 2022, and a web-printout created January 23, 2023. *Id.*, 132-33 (Attachment 1a), 134-135 (Attachment 1b).

Thus, Petitioner failed to provide "a threshold showing" of when Exhibit 1004 was publicly available such that it constitutes prior art. *See Apotex Inc. v. Celgene Corp.*, IPR2018-00685, Paper 8 at 27-28 (Pat. Tr. & App. Bd. Sept. 27, 2018).

2. Petitioner Misrepresents Godoy's Disclosures

For at least two separate reasons, Petitioner has not shown that Godoy discloses a "combination" "consisting of" the claimed fungicides. *Cf.* Petition, 20 (asserting that Godoy discloses "the combination of: benzovindiflupyr + mancozeb + azoxystrobin"); EX1003, ¶109 (asserting that "Godoy explicitly disclosed the fungicidal combination of benzovindiflupyr, mancozeb and azoxystrobin").

First, contrary to Petitioner's assertion, Godoy does not disclose a "combination" of mancozeb, benzovindiflupyr, and azoxystrobin, as claimed (i.e., as a mixture containing the three fungicides). *See* Petition, 19. Instead of specifying that the fungicides were combined or mixed, as assumed without

evidence by Petitioner, Godoy states that multisite fungicides such as mancozeb were "used ***in association with***… [site-specific fungicides] azoxystrobin + benzovindiflupyr 60 + 30 g a.i. ha-1 (Elatus®, Syngenta) (Table 3)." EX1005, 3, 6. That is, rather than mixtures applied as a single combination, the protocols are based on using fungicides in separate "***associated treatments***." *See, e.g.*, EX1005, 4 (Table 3 caption), 6 (noting fungicide treatments "with associations of mancozeb").

For example, for "associated" treatments of azoxystrobin, benzovindiflupyr, and mancozeb (on which Petitioner relies), Godoy lists "azoxystrobin + benzovindiflupyr" separately from mancozeb and identifies their separate "commercial products" as Elatus® and PNR (product not registered). EX1005, 4 (Table 3, treatment 23). Reinforcing that the three fungicides were not combined, Godoy indicates that "Nimbus" was added to "azoxystrobin + benzovindiflupyr" but not to mancozeb. EX1005, 4 (Table 3, treatment 23, footnote 1). Godoy's disclosure of "associated treatments" thus reflects two distinct compositions—(1) azoxystrobin + benzovindiflupyr + "Nimbus" and (2) mancozeb—separately applied to the same crop.

This is consistent with the use of the word "association" in the context of multiple, separately applied fungicidal applications. *See* EX2001 (de Souza); EX2002 (certified translation of de Souza), 2-4. More specifically, de Souza

describes an "association of protective and systemic fungicides" (Abstract), where a protective fungicide was applied in the morning and one or more systemic fungicides were subsequently applied in the afternoon. *Id.*, 3-4. Because they are applied separately (one in the morning, the other in the afternoon), the two fungicides cannot have been mixed together as a combination. Like Godoy, de Souza describes this as an "association" of the different fungicides. *Id.*, 2; *see also id.*, 5 (describing use of protective and systemic fungicides "in conjunction"). Neither describe these "associated" treatments as combinations or mixtures.

Even if Petitioner had asserted that a *possible* reading of Godoy is that the fungicides were mixed as a combination prior to application—though it did not so argue and there is no such evidence—this would still not anticipate the claimed fungicidal "combinations." *Wasica Finance GMBH v. Continental Automotive Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017) ("[I]t has long been understood that ambiguous references do not, as a matter of law, anticipate a claim."). Indeed, the Board has repeatedly found ambiguous references insufficient for even a threshold showing of anticipation and, accordingly, denied institution. *E.g., Lutron Elecs. Co. v. Geigtech E. Bay LLC*, PGR2020-00012, Paper 20 at 24-26 (Pat. Tr. & App. Bd. Aug. 4, 2020); *Hong Kong Ucloudlink Network Tech. Ltd. v. Simo Holdings Inc*., IPR2019-00857, Paper 15 at 13, 20-22 (Pat. Tr. & App. Bd. Sept.

17, 2019); *Polycom, Inc. v. Fullview, Inc*., IPR2019-00647, Paper 12 at 12-14 (Pat. Tr. & App. Bd. July 10, 2019).

Second, even if one assumes that Godoy used combinations (as opposed to "associated" treatments, as disclosed), Petitioner failed to show that Godoy discloses any treatment "consisting of" the claimed fungicides. In this regard, it is "well understood in patent usage that 'consisting of' is closed-ended and conveys limitation and exclusion" *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) ("'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").

As noted, Godoy states that "Nimbus" was added to the "azoxystrobin + benzovindiflupyr" Elatus product (though not to mancozeb):

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.

EX1005, 4 (footnote 1 below Table 3). The Petition does not dispute that Godoy discloses the addition of Nimbus but fails to address this component in view of the claimed "consisting of" limitation. *See* Petition, 20.

"Nimbus" is the proprietary name for pesticides containing a sulfur fungicide excluded from the "consisting of" combinations claimed in the '727 patent. 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). More specifically, as shown in the product literature, these "Nimbus" products contain sulfur in water dispersible granules that are mixed with water and sprayed on crops to control fungi. EX2003, 1-2; EX2006, 7; EX2010, 5. At least two of these products were commercialized prior to 2015. EX2004, 1 (showing Nimbus WG Fungicide/Miticide of EX2003 was registered in 2013); EX2008, 2 (showing the Nimbus product of EX2005 was registered in 2006).

As noted above, the Petition nowhere addresses "Nimbus" in the context of the "consisting of" limitation and is not entitled to incorporate arguments it did not raise. 37 C.F.R. § 42.6(a)(3); *3M Co. v. Evergreen Adhesives, Inc*., 860 Fed. Appx. 724, 728 (Fed. Cir. 2021) ("Thus, we are not persuaded that the Board abused its discretion when it concluded that 3M's arguments were present in the briefing prior to the Final Written Decision only in the form of improper incorporation by reference to Dr. Prud'homme's testimony."). Nevertheless, while Petitioner's declarant asserts that Nimbus is a mineral oil, the articles by Moura and Della Vechia that he cites say nothing about the contents of the Nimbus product *disclosed in Godoy*. EX1003, 41 n. 3 (citing "Moura (EX1016 [*sic*, EX1017])" and

"Della Vechia (EX1017 [*sic*, EX1018])"); *see* EX1017; EX1018. Petitioner's declarants failed to even address the commercial Nimbus fungicide products (EX2003-EX2010) or provide any basis for why a POSA would have understood Godoy's Nimbus to reference mineral oil as opposed to a sulfur fungicide. *See also Wasica*, 853 F.3d at 1284.

B. Ground 2a: Petitioner Failed to Show Claims 1-10 Are Anticipated by Tobler

Petitioner failed to show that Tobler (EX1006) clearly and unequivocally discloses the claimed combinations of fungicides without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972).

Petitioner relies on Tobler's embodiment E1, which includes the combination of "mancozeb+TX1," where TX1 is a generic reference to the compound A-1.1 plus a compound selected from the group P. Petition, 30-31; EX1006, 28:10-11. To arrive at Petitioner's asserted embodiment purportedly covered by the claims, a POSA would be required to, e.g.:

1. Select embodiment E1 over embodiment E2 and Tobler's "preferred" embodiments. *See* EX1006, 28:6-9 (identifying embodiment E1); *id.*, 29:51 (identifying "preferred" embodiments).

2. After selecting embodiment E1, select mancozeb+TX1 from among a list of **120 options**, where mancozeb+TX1 is the 82nd item in the list

and is not identified as preferred or otherwise singled out. *Id.*, 28:10-57.

3. Select the group P component of TX1 to be one of the claimed ergosterol biosynthesis inhibitors or quinone outside inhibitors, where such fungicides comprise a fraction (less than 20%) of the **250 options** recited group P. *Id.*, 22:61-25:67 (defining group P).

Neither Petitioner nor its declarant assert (much less establish) that Tobler provides guidelines for selecting among the numerous options in Tobler to arrive at the claimed fungicidal combinations. Petition, 29-33; EX1003, ¶¶136-146.

Indeed, Petitioner and its declarant fail to address the number of permutations within embodiment E1 of Tobler—which, as shown above, comprises at least about ***30,000 possible combinations*** (120 x 250)—none of which is identified as "preferred." This failure is fatal to Petitioner's arguments based on Tobler.

As Petitioner's own case law acknowledges, "how one of ordinary skill in the art would understand the relative size of a genus or species in a particular technology is of critical importance" when analyzing anticipation. Petition, 31-32 (quoting *Osram Sylvania, Inc. v. Am. Induction Techs., Inc.*, 701 F.3d 698, 706 (Fed. Cir. 2012). Thus, Petitioner's failure to address the expansive scope of the genus disclosed in Tobler precludes it from establishing anticipation. *See Osram*, 701 F.3d at 706 (reversing summary judgment of anticipation due to the lower

court's failure to consider the relative size of the genus in the prior art); *see also 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 676, 681 (C.C.P.A. 1962)).

Relatedly, Petitioner and its declarant failed to show that a POSA would have immediately envisaged the claimed fungicidal combinations from among the 30,000 options encompassed by embodiment E1. Petition, 32; EX1003, ¶¶142-144. Here, Petitioner relies solely on the testimony of its declarant to argue that the claimed combinations would be "envisage[d]," focusing solely on one component of embodiment E1 (group P). Petition, 52 (citing EX1003, ¶¶142-144. But Petitioner's declarant merely repeats—nearly verbatim—the same conclusory assertions set forth in the Petition. *Compare* Petition, 51-52 *with* EX1003, ¶¶142-144. As such, Petitioner's declarant's testimony is entitled to little weight. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (Pat. Tr. & App. Bd. Aug. 24, 2022) (*precedential*) (explaining that a declaration that "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" is "entitled to little weight").

At bottom, Petitioner has not provided any legitimate support for its argument that Tobler anticipates any claim of the ’727 patent.

C. Ground 2b: Petitioner Failed to Show Claims 1-10 Would Have Been Obvious over Tobler

Effectively conceding that a claimed combination is not identically disclosed from Tobler’s at least about 30,000 possible permutations, Petitioner argues that the claims of the ’727 patent would have been obvious over Tobler. *See, e.g.*, Petition, 29-32. Petitioner, however, also failed to support this argument.

As also discussed in Ground 2a above, Petitioner failed to articulate how Tobler would have guided a POSA to any of the fungicidal compositions claimed in the ’727 patent, instead relying on overlapping disclosures between Tobler’s “group P” components. Petition, 31-32. Petitioner is entirely silent as to any alleged guidance in Tobler directing a POSA to a specific combination or narrow set of combinations within the scope of the challenged claims. *Id.* In particular, Petitioner has not shown that Tobler would have guided a POSA to combine (1) benzovindiflupyr with (2) mancozeb (disclosed as one of 120 options in embodiment E1 of Tobler) and (3) a member of Tobler’s group P that is recited in the claims of the ’727 patent (where 80% of the active ingredients in Tobler’s group P are not recited in the claims of the ’727 patent). *Id.*; *supra*, § V.B.

Petitioner thus failed to establish a threshold showing of obviousness based on Tobler because the mere disclosure of a broad genus fails to render obvious

each species therein. *In re Baird*, 16 F.3d 380, 382-83 (Fed. Cir. 1994); *see also 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)).

D. Ground 2c: Petitioner Failed to Show Claims 1-10 Would Have Been Obvious over Tobler in view of Godoy

Petitioner argues that Tobler in view of Godoy would have rendered the claims of the '727 patent obvious. Petition, 33-34. As set forth above, Petitioner failed to establish that Godoy qualifies as prior art. *Supra*, § IV.A.1.

Petitioner's argument further fails on the merits. Petitioner relies on Godoy's generic statement—not specific to any fungicide—that "multisite fungicides may be an option for the control of rust and as an anti-resistance strategy." Petition, 33. In addition to this saying nothing about combined treatments, Petitioner failed to articulate why Godoy would have guided a POSA to modify Tobler to arrive at any of the claimed fungicidal combinations, much less a combination "consisting of" the claimed fungicides to the exclusion of non-recited fungicides (such as sulfur, marketed under the tradename Nimbus). *Id.*

"In light of" Petitioner's failure to address these points and "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).

E. Ground 3a: Petitioner Failed to Show Claims 1-10 Would Have Been Obvious over De Oliveira

As the Examiner previously found and Petitioner acknowledges, De Oliveira (EX1007) does not disclose benzovindiflupyr, a required fungicide in all claims of the '727 patent. EX1002, 155; Petition, 52. Yet Petitioner failed to establish that the addition of benzovindiflupyr would have been obvious based on De Oliveira's disclosure of succinate dehydrogenase inhibitors (SDHIs). *See* Petition, 52-53. Petitioner thus failed to establish that any claim would have been obvious over De Oliveira. *See* Petition, 50-53.

Petitioner's argument that De Oliveira's disclosure of succinate dehydrogenase inhibitors (SDHIs) renders the addition of benzovindiflupyr obvious rests solely on testimony of its declarant. *Id.*, 52-53 (citing EX1003, ¶198). Yet once again, Petitioner's declarant simply repeats the conclusory assertions set forth in the Petition, without providing "any additional supporting evidence or provide any technical reasoning" to support his conclusory opinion. *Compare* EX1003, ¶¶196-198 *with* Petition, 51-53; *Xerox*, IPR2022-00624, Paper 9 at 15. This conclusory testimony is insufficient to support Petitioner's burden. *In re*

Magnum Oil Tools, 829 F.3d at 1380 ("In light of McClinton'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 McClinton had met its burden of proving by a preponderance of the evidence that the claimed invention would have been obvious.").

Additionally, neither Petitioner nor its declarant explain why a POSA would been led to select an undisclosed SDHI (benzovindiflupyr) where De Oliveira expressly discloses other preferred succinate dehydrogenase inhibitors, i.e., "benodanil, flutolanil, mepronil, fluopyram, fenfuram, carboxin, oxycarboxin, thifluzamide, bixafen, fluxapyroxad, furametpyr, isopyrazam, penflufen, penthiopyrad, sedaxane and boscalid." EX1007, 16; Petition, 52-53; EX1003, ¶198. Nor do they argue that a POSA would have envisioned benzovindiflupyr as a suitable replacement for De Oliveira's preferred SDHIs. Petition, 52-53; EX1003, ¶198. Indeed, neither Petitioner nor its declarant identified the number of SDHIs available or known as of November 4, 2016, or alleged obviousness in light thereof. *E.g.*, Petition, 52; EX1003, ¶198.

As such, Petitioner failed to show that a POSA would have been motivated to add benzovindiflupyr to any combination disclosed in De Oliveira.

F. Ground 3b: Petitioner Failed to Show Claims 1-10 Would Have Been Obvious over De Oliveira in view of Wiglesworth, Tobler, and Godoy

Petitioner's secondary references—Wiglesworth (EX1008), Tobler (EX1006) and Godoy (EX1005)— do not cure the deficiencies in De Oliveira. *See* Petition, 53-54; EX1003, ¶20.

First, Petitioner failed to explain why a POSA would have been motivated to modify De Oliveira in view of Wiglesworth and/or Tobler to arrive at any of the claimed fungicidal combinations. *Id.*, 53-54. Petitioner conclusorily asserts that such a motivation exists, citing to the testimony of its declarant as its sole support. *Id.* Yet, Petitioner's declarant parrots—nearly verbatim—the same conclusory assertions set forth in the Petition. *Compare* Petition, 53-54 *with* EX1003, ¶¶199-201. As such, Petitioner's declarant's testimony is entitled to little weight and is insufficient to meet Petitioner's burden. *See Xerox*, IPR2022-00624, Paper 9 at 15; *In re Magnum Oil Tools*, 829 F.3d at 1380.

Rather than explaining (and supporting) its rationale for combining references, Petitioner argues that Wiglesworth and Tobler disclose that benzovindiflupyr was effective at controlling soybean rust; that Wiglesworth shows that benzovindiflupyr is "combinable" with azoxystrobin; and that Tobler claims "synergistically effective amounts of (A) a compound of formula I [which includes benzovindiflupyr]; and (B2) an azole fungicide." Petition, 53. Yet

Petitioner failed to explain how Wiglesworth and Tobler would have motivated a POSA to modify De Oliveira to arrive at a combination "consisting of" the claimed fungicidal combinations. Petition, 53-54.

De Oliveira discloses numerous options for treating soybean rust, including with fungicides specifically excluded from the claims of the '727 patent, including "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." *Id.*, 8-9, 14-15. Petitioner failed to even address—much less explain—why a POSA would have been motivated to make a combination "consisting of" the claimed combinations, e.g., without De Oliveira's fungicides excluded from the claims. *Supra*, § II.D.5.

Notably, De Oliveira's working examples do not contain *any* succinate dehydrogenase inhibitors, i.e., the class of fungicide broadly encompassing benzovindiflupyr. *Id.*, 24. Moreover, De Oliveira further teaches that the multisite fungicides may be applied separately—not necessarily as a combination with numerous other possible fungicides. *E.g., id.*, 7 (disclosing a method of "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 …."), 8 (disclosing a method of "treating the plant at the locus of the infection with at least one multi-site contact fungicide; and concurrently, ***prior or subsequently*** to the multi-site contact fungicide, with at least one systemic fungicide."). Petitioner fails to address any of these issues. *In re Magnum Oil Tools*, 829 F.3d at 1380 ("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 short, Petitioner failed to explain how—absent hindsight—De Oliveira in view of Tobler and Wiglesworth disclose a combination "consisting of" the claimed fungicides.

Finally, as noted above, Petitioner failed to establish that Godoy qualifies as prior art. *Supra*, § IV.A.1. Nevertheless, Petitioner has not established that any combination involving Godoy would have rendered the claims of the '727 patent obvious. For example, Petitioner's single sentence assertion "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" (Petition, 54) fails articulate why Godoy would have guided a POSA to modify De Oliveira to arrive at any of the claimed fungicidal combinations. *See In re Anova Hrg. Labs, Inc*., 809 Fed. Appx. 840, 843 (Fed. Cir. 2020) (remanding where "[t]he Board also does not explain why a person of ordinary skill in the art would be motivated to modify [the primary reference], which already includes vents, to address occlusion effect" addressed by the secondary reference).

G. Ground 4: Petitioner Failed to Show the Claims of the '727 Patent Lack Written Description under 35 U.S.C. § 112

Petitioner's challenge to the written description of the '727 patent is legally baseless and reflects a fundamental misapprehension of the written description requirement. *See* Petition, 73-75.

Petitioner does not dispute that the '727 patent describes the claimed fungicidal combinations, compositions, and methods of use, including with textual description and two examples. 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:

- "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." Petition, 7-8.

- "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.

- "[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.

This undisputed disclosure demonstrates that the inventors possessed the invention as claimed. "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*) ("[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.").

Ignoring the legal standard and what is actually claimed, Petitioner baldly mischaracterizes the claimed subject matter as "***not*** directed at the combination of fungicidal ingredients, but rather to the alleged synergistic interaction between them." Petition, 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").

Petitioner's focus on whether there is description of unclaimed "synergy based on the material presented by UPL in Tables 1 or 2" (Petition, 73-75) is of no moment for written description of the claimed combinations and methods of applying combinations. Petitioner's error is conflating a description of the composition itself with objective indicia that establish non-obviousness by, for example, showing unexpected properties of a composition. 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) ("We have found no

cases supporting the position that a patent applicant's evidence and/or arguments traversing a § 103 rejection must be contained within the specification. There is no logical support for such a proposition...."). 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. Petition, 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." Petition, 76. This again has no bearing on written description. *See*

Singh v. Brake, 317 F.3d 1334, 1346 (Fed. Cir. 2003) ("We are not persuaded by any of these arguments, and conclude that Singh has apparently confused the criteria for proving obviousness with those for demonstrating that a disclosure is nonenabling."). 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 misdirected to unclaimed synergies fail to support even a threshold showing of unpatentability for lack of written description. *Merck Sharp & Dohme Corp. v. Genentech, Inc.*, PGR2021-00036, Paper 10 at 20 (PTAB July 24, 2021) (denying institution where Petitioner's written description argument "failed to address appropriately the claimed subject matter of the challenged claims").

H. Ground 5: Petitioner Failed to Show the Claims of the '727 Patent Are Not Enabled under 35 U.S.C. § 112

Like its flawed attack on the '727 patent's written description, Petitioner's challenge to enablement is premised on the misguided notion that the specification must enable unclaimed "enhanced efficacy and synergy" or "enhanced greening."

Petition, 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*, § IV.H.

More specifically, Petitioner's argument necessarily fails from the start as there is no requirement that a patent enable how to make and use unclaimed features of the invention, 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) (explaining that a patent "is not required to enable the most optimized configuration, unless this is an explicit part of the claims"); *Lochner Technologies, LLC v. Vizio, Inc.*, 567 Fed. Appx. 931, 935 (Fed. Cir. 2014) (agreeing that "there is no precedent requiring a patentee to disclose or enable unclaimed elements").

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." Petition, 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 and insufficient to meet its burden. *In re Magnum Oil Tools*, 829 F.3d at 1380; *see also In re Geisler*, 116 F.3d

1465, 1470 (Fed. Cir. 1997) (explaining that attorney arguments and conclusory statements that are unsupported by factual evidence are entitled to little probative value).

The Petition also does not identify what part of the specification it is addressing (*see* Petition, 77), but Patent Owner speculates it is Table 1.

	Dose rates	Mean percent disease control	
Treatment	(ml/g/ha)	2015/16	2016/17

EX1001, 20:40-58. Assuming Petitioner is addressing Table 1, its conclusory attorney argument makes no reference to having considered Table 1 in context of 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, as shown below. EX1001, 20:26-30.

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

’727 patent, 20:17-49 (highlighting added). The Petition’s attorney argument is simply 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.” Petition, 77. Again, “there is no precedent requiring a patentee to disclose or enable unclaimed elements.” *Lochner*, 567 Fed. Appx. at 935.

Petitioner also implies that the ’727 patent lacks a practical utility and thus does not teach one how to use the invention. Petition, 78 (arguing that “the only utility specifically referred to by the Patentee was the ‘enhanced efficacy of the combination and … synergistic effect,’” and noting that § 101 requires that the specification disclose a practical utility for the invention.). 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.*, 1:17-18. 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. Petition, 76-80. *See In re Brana*, 51 F.3d 1560, 165-66 (Fed. Cir. 1995) (reversing the Board's rejection of claims for lack of utility and enablement, where the Board did not provide any evidence "to question the asserted utility of applicants' compounds").

In fact, *Petitioner's evidence establishes utility*. Specifically, although Petitioner argues that it did not observe *synergy* in its own field trial (*id.*, 80-81), its own data shows that claimed fungicidal combinations provided enhanced disease control when compared to stand-alone treatments of individual fungicides (*e.g.*, EX1020, 5). As such, and Petitioner's evidence shows that the claimed fungicidal combinations have a practical utility.

V. The Board Should Exercise its Discretion to Deny Institution

A. The Board Should Deny Institution Under § 324(a)

Discretionary denial is warranted here based on the futility of Petitioner's multitudinous grounds, including Ground 1 based on Godoy (which was not shown to be prior art), Grounds 2a, 2b, and 2c based on Tobler (which requires picking and choosing within a genus of at least about 30,000 combinations), Grounds 3a and 3b based on De Oliveira (which was discussed and overcome during prosecution), and Grounds 4-5 based on 35 U.S.C. § 112 (legally erroneous argument that a patent must describe and enable unclaimed features of the invention). *See, e.g.*, *Chevron Oronite Co. LLC v. Infineum USA L.P.*, Case

IPR2018-00923, Paper 9 (Pat. Tr. & App. Bd. Nov. 7, 2018) (denying institution where the petition failed to establish a reasonable likelihood of invalidity for several grounds); *Deeper, UAB v. Vexilar, Inc.*, Case IPR2018-01310, Paper 7 (Pat. Tr. & App. Bd. Jan. 24, 2019) (same).

B. The Board Should Deny Institution Under § 325(d)

Discretionary denial is further warranted under 35 U.S.C. § 325(d). *See Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Paper 6, 13 (Pat. Tr. & App. Bd. Feb. 13, 2020) (*designated precedential*).

First, Petitioner relies on substantially the same art previously presented during prosecution of the '727 patent. For example, Petitioner's primary reference in Ground 2 (Tobler) shares a specification with another patent publication by Tobler submitted during prosecution (US 2010/0216640). EX1001, 1 (listing Tobler as US 2010/0216640); EX2011 (Tobler, US 2010/0216640). Petitioner's primary reference in Ground 3 (De Oliveira) was also considered—and overcome—in combination with a publication disclosing benzovindiflupyr (Grammenos, EP2783569). EX1002, 153-157 (rejection); *id.*, 138 (applicant's response); *id.*, 2 (withdrawing rejection). *See Advanced Bionics*, IPR2019-01469, Paper 6, 13 (Step 1).

The only ground references not considered during prosecution were Godoy and Wiglesworth. Reliance on neither warrants institution.

First, Petitioner has not even established that Godoy was available in the prior art. *Supra*, § IV.A.1. The fact that the Examiner did not identify Godoy in any prior art search further undermines its accessibility as prior art.

Next, Petitioner fails to assert (much less establish) that its secondary reference Wiglesworth is not "substantially the same [as] prior art… presented to the Office." 35 U.S.C. § 325(d); *see* Petition, 3-4. In fact, the disclosures of Wiglesworth on which Petitioner relies—that benzovindiflupyr was "'extremely efficacious on soybean rust' and combinable with azoxystrobin" (Petition, 53)—were of record during prosecution from at least Kemmitt (EX2012) and Grammenos (EX2013).

For example, Kemmitt—which was discussed at length by the Examiner—discloses that benzovindiflupyr controls soybean rust, among other pathogens. EX1002, 94-97, 150-153; EX2012 (Kemmitt), [0029]. The Examiner further discussed Grammenos, which discloses that benzovindiflupyr is combinable with azoxystrobin. EX1002, 155-156; EX2013 (Grammenos), 27 (Table T1 identifying a fungicidal composition containing II-3 and II-5); *id.*, [0096] (defining azoxystrobin as II-3 and benzovindiflupyr as II-5).

The table below summarizes the discussion above of the publications relied on in the Petition.

Summary of Cited Prior Art		
Ground	**Publication**	**Comments**
1-3	Godoy (EX1004)	Not shown to be prior art. *Supra*, § IV.A.1.
2, 3	Tobler (EX1006)	Considered during prosecution as US 2010/0216640 A1
3	De Oliveira (EX1007)	Considered during prosecution
3	Wiglesworth (EX1008)	Cumulative of Kemmitt and Grammenos (EX2012 and EX2013)

Finally, Petitioner has not established material error during prosecution. *See Advanced Bionics,* IPR2019-01469, Paper No. 6, 8 (Step 2). Petitioner argues that the Examiner "was not aware of the language at the end of the De Oliveira reference (e.g., regarding the alleged unexpected results when using mancozeb)." Petition, 3. Especially where the Examiner discussed De Oliveira in multiple Office Actions and under both anticipation and obviousness, there is no evidence that the Examiner was not aware of De Oliveira's full disclosure.

Indeed, the Examiner specifically noted that De Oliveira disclosed "a method for treating soybean rust in a host leguminous plant, wherein the method comprises treating the plant at the locus of the infection with **mancozeb**; and **at least one systemic fungicide**, including the **quinone outside inhibitor**, selected from ... a strobilurin fungicide such as **azoxystrobin**...." EX1002, 154 (emphasis in original). The Examiner further noted that the systemic fungicide "may be a

succinate dehydrogenase inhibitor fungicide (SDHI)." *Id.* (emphasis in original). The Examiner further stated that De Oliveira discloses that this combination provided unexpected and surprising results:

> De Oliveira et al disclose that it has been found that ***a combination of a multi-site contact fungicide***, preferably a dithiocarbamate fungicide [e.g., mancozeb], along with a systemic fungicide selected from at least one Qo inhibitor (***Quinone outside inhibitors***), at least one Qi (quinone inside) inhibitor, at least one OM inhibitor (demethylation inhibitor) or at least one ***SDH Inhibitor*** (succinate dehydrogenase inhibitors) leads to an unexpected and ***surprisingly good control of Soybean Rust*** as compared to other fungicides (see [0077]).

EX1002, 154. Thus, the Examiner appears to have fully appreciated and actually addressed on the record De Oliveira's disclosures, including its disclosure that the combination of mancozeb with fungicides such as azoxystrobin and an SDHI inhibitor provide surprisingly good control of soybean rust.

The Examiner also considered the validity of the claims under 35 U.S.C. § 112, including at least written description and definiteness. EX1002, 149-150, 201-203. Petitioner has not asserted, much less established, any error in the Examiner's §112 analysis. *See PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1304 (Fed. Cir. 2008) (absent evidence to the contrary, "a qualified

government agency [is] presumed to have properly done its job." (quotation omitted)); MPEP § 2163 ("The following Guidelines establish the policies and procedures to be followed by Office personnel in the evaluation of any patent application for compliance with the written description requirement of 35 U.S.C. 112."); MPEP § 2164 (setting forth the considerations for enablement).

VI. Conclusion

For the foregoing reasons, UPL requests that the Board deny institution.

Respectfully Submitted

Date: May 8, 2023

By: /Mark J. Feldstein/
Mark J. Feldstein, Reg. No. 46,693)

Lead Counsel for UPL Limited

CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Patent Owner's Preliminary Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1), because it contains 10,419 words, according to the word-processing system used to prepare this Petition, 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: May 8, 2023 By: /Mark J. Feldstein/
Mark J. Feldstein, Reg. No. 46,693)

Lead Counsel for UPL Limited

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Patent Owner's Preliminary Response** was served electronically via email on May 8, 2023, in its entirety on the following:

Toni-Junell Herbert
David M. Klecyngier
Daniel Bucca Ph.D.
BakerHostetler LLP
Washington Square, Suite 1100
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5403
therbert@bakerlaw.com
dklecyngier@bakerlaw.com
dbucca@bakerlaw.com
mrick@bakerlaw.com

Petitioner has consented to electronic service.

Dated: May 8, 2023

/William Esper/
William Esper
Case Manager and PTAB Coordinator
Finnegan, Henderson, Farabow,
Garrett & Dunner, L.L.P.