IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

PIONEER HI-BRED INTERNATIONAL, INC. and E. I. DU PONT DE NEMOURS AND COMPANY,	)	
Plaintiffs,	)	C.A. No. _____
v.	)	**JURY TRIAL DEMANDED**
SYNGENTA SEEDS, LLC,	)	
Defendant.	)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs Pioneer Hi-Bred International, Inc. and E. I. du Pont de Nemours and Company (collectively "Plaintiffs"), by and through their undersigned attorneys, hereby commence this action for patent infringement against Defendant Syngenta Seeds, LLC ("Defendant" or "Syngenta") and allege as follows:

NATURE OF THE ACTION

1. This is an action for infringement of United States Patent No. 8,859,846 ("the '846 Patent") arising under the patent laws of the United States, 35 U.S.C. § 100 *et seq*.

THE PARTIES

2. Plaintiff Pioneer Hi-Bred International, Inc. ("Pioneer") is an Iowa corporation with a place of business at 7000 NW 62nd Ave., Johnston, Iowa 50131. Pioneer is a subsidiary of Corteva, Inc.

3. Pioneer is one of the world's largest commercial seed producers. Pioneer uses genetic research to develop hybrid seeds designed to increase quantity, quality, and sustainability of crop yields for farmers.

4. Plaintiff E. I. du Pont de Nemours and Company ("DuPont") is a Delaware corporation with a place of business at 974 Centre Road, Wilmington, Delaware 19805. DuPont is a subsidiary of Corteva, Inc.

5. Plaintiffs have received numerous patents in the United States and in other countries for their innovative discoveries, including the '846 Patent. Plaintiffs jointly own, by valid assignment, all rights, title, and interest in the asserted '846 Patent.

6. Defendant Syngenta Seeds, LLC is a limited liability company organized and existing under the laws of the State of Delaware with a place of business at 2001 Butterfield Rd., Downers Grove, Illinois 60515. Syngenta Seeds, LLC is a global agricultural technology company engaged in developing, producing, and selling seeds for hybrid varieties of crops, including maize.

JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, 35 U.S.C. § 100 *et seq*. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. This Court has personal jurisdiction over Syngenta Seeds, LLC because it is a Delaware limited liability corporation and has purposefully availed itself of the protections of this forum by incorporating in Delaware.

9. Venue is proper in this Judicial District under 28 U.S.C. §§ 1391(b) and (c) and 1400(b), at least because Syngenta Seeds, LLC is a Delaware limited liability corporation and because Delaware is a convenient forum for resolution of the parties' disputes set forth herein.

THE PATENT IN SUIT

10. The '846 Patent, entitled "Doubling of Chromosomes in Haploid Embryos," was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on October 14, 2014. The '846 Patent identifies Joanne Barton, Sheila Maddock, Xinli Wu, Zuo-Yu

Zhao, Mark Williams, Tanveer Hussain, and William Gordon-Kamm as inventors. A true and correct copy of the '846 Patent is attached hereto as Exhibit A.

11. The '846 Patent issued from United States Patent Application No. 11/532,921, which was filed with the USPTO on September 19, 2006, and published on September 4, 2008. The '846 Patent claims priority to U.S. Provisional Application No. 60/718,989, filed on September 21, 2005.

12. The invention of the '846 Patent relates to maize breeding. Maize, also known as corn, is a cereal grain that originated in the Americas. It is used as human food, livestock feed, in biofuel production, and as an industrial raw material. Maize is a commercially important crop in the United States and is also widely produced throughout the world.

13. The '846 Patent is generally directed to a method of obtaining a doubled haploid maize plant. The doubled haploid method is beneficial and valuable for speeding up breeding programs and production of hybrid maize varieties. It includes, among other steps, selecting maize haploid embryos (i.e., containing only one set of chromosomes) and contacting the embryos with a chromosome doubling agent to form doubled haploid embryos (i.e., containing two sets of chromosomes), from which doubled haploid maize plants can be generated. As Syngenta has reported, "[t]he haploid method lets breeders produce inbred lines within just two generations, while traditional breeding takes 10 generations." Ex. B at 3.[1] These faster breeding times, as Syngenta reports, "speed[] up . . . development for hybrid crops by several years." *Id*.

14. In its doubled haploid method, the '846 Patent describes isolating haploid maize embryos for chromosome doubling. Ex. A at claim 1. Using maize embryos is beneficial for

[1] Syngenta website, *Double-Haploid Induction Speeds Up Plant-Breeding Process*, https://www.syngenta-us.com/thrive/research/double-haploid-induction.html (last accessed September 29, 2022).

improving speed and efficiency because contact with the doubling agent occurs at an early stage of development, increasing the number of viable doubled haploid plants developed. As Syngenta later acknowledged in its own U.S. Patent No. 8,980,632 ("the '632 patent"), maize embryos are "the most suitable plant part . . . for use in chromosome doubling." Ex. C at 16:40-49 (the embryo is "desirable target material" for doubling). For such doubling, Syngenta cited and incorporated by reference the publication of an international patent application corresponding to the '846 Patent filed under the Patent Cooperation Treaty (WO 2007/038075), stating that "Doubling methods employing colchicine, nitrous oxide and other chemicals are shown in . . . WO/2007/038075 . . . incorporated by reference." *Id.* at 16:49-58.

15. The claims of the '846 Patent are generally directed to a method of obtaining a doubled haploid maize plant. Claim 1, for example, recites:

> 1. A method of obtaining a doubled haploid maize plant, said method comprising:
>
> (a) pollinating silks of a maize ear with a maize inducer line to produce at least one diploid maize embryo and at least one haploid maize embryo;
>
> (b) isolating said haploid maize embryo between 4-21 days after step (a), wherein said at least one haploid maize embryo is distinguished from the diploid maize embryos via expression of a marker;
>
> (c) contacting said haploid maize embryo with a chromosome doubling agent to produce at least one doubled haploid maize embryo cell;
>
> (d) culturing said doubled haploid maize embryo cell on a non-callus promoting medium; and

(e) generating a doubled haploid maize plant from said doubled haploid maize embryo cell.

16. The ’846 Patent broadly defines a “plant” produced by the claimed method to “include[] . . . whole plants, plant organs (e.g., leaves, stems, roots, etc.), seeds and plant cells and progeny of same.” Ex. A at 2:1-3.

DEFENDANT’S INFRINGING ACTIVITIES

17. On information and belief, Syngenta has produced doubled haploid maize plants (including seeds) at sites in the United States (including in at least North Carolina and Hawaii), Chile, and Guatemala since the ’846 Patent issued on October 14, 2014.

18. On information and belief, Syngenta uses, offers to sell, or sells doubled haploid maize plants (including seeds) in the United States that were made by a process claimed in the ’846 Patent. On information and belief, Syngenta imports such doubled haploid maize plants (including seeds) from at least Guatemala and Chile into the United States.

19. On information and belief, after the issuance of the ’846 Patent, Syngenta has infringed at least claim 1 of the ’846 Patent under 35 U.S.C. § 271(g), either literally or under the doctrine of equivalents, by using the method of claim 1 without authority to produce doubled haploid maize plants (including seeds) and import them into the United States, or by using, offering to sell, or selling such doubled haploid maize plants (including seeds) in the United States.

20. Syngenta’s infringing use of the patented method is illustrated by a Syngenta Presentation at the XVI Congreso Internacional de Manejo Integrado de Plagas (16th International Congress on Integrated Pest Management) in Guatemala (“Syngenta Presentation”), attached

hereto as Exhibit D.[2] The presentation is dated April 2019. Ex. D at 1-2. A certified translation is attached hereto as Exhibit E.

21. The Syngenta Presentation describes two Syngenta "ERDH Nurseries." Ex. E at 9. The first is located in Arica, Chile. The second is located in Jalapa, Guatemala. Upon information and belief, "ERDH Nurseries" refers to Embryo Rescue Doubled Haploid Nurseries.

22. The Syngenta Presentation shows that Syngenta has used an infringing method that includes each of steps (a) through (e) of claim 1 of the '846 Patent.

23. First, upon information and belief, the Syngenta Presentation shows that Syngenta pollinated silks of a maize ear with a maize inducer line to produce at least one diploid maize embryo and at least one haploid maize embryo, as required by step (a) of claim 1 of the '846 Patent. Slides 22 and 23 of the Syngenta Presentation describe and visually depict pollinating the silks of a maize ear with pollen from a maize inducer line to produce haploid and diploid embryos.

[2] The Syngenta Presentation is also publicly accessible at http://docplayer.es/160051855-Classification-internal-use-only.html (last accessed September 29, 2022).

24. Second, upon information and belief, the Syngenta Presentation shows that Syngenta isolated the haploid maize embryo between 4-21 days after pollination, wherein the haploid maize embryo was distinguished from diploid maize embryos via expression of a marker, as required by step (b) of claim 1 of the '846 Patent. Slide 24 of the Syngenta Presentation shows the extraction and isolation of haploid maize embryos:

Slide 25 shows distinguishing between haploid embryos (cream-colored) from diploid embryos (purple) based on the expression of a color marker:

25. Upon information and belief, the Syngenta Presentation also shows that Syngenta isolated the haploid maize embryo between 4-21 days after pollination. Upon information and belief, the color marker used by Syngenta to distinguish the isolated haploid embryos expresses before 21 days after pollination. On Slide 18, Syngenta describes the use of an inducer line containing the anthocyanin color marker R1-nj. The '846 Patent identifies R1-nj as appropriate for use in its doubled haploid process. Ex. A at 9:47-61. Moreover, in its '632 patent, Syngenta described the use of anthocyanin color markers in maize that "are useful in a haploid embryo rescue identification method" because the identifying purple color is evident in the "early stages of embryo development." Ex. C at 16:17-33. Syngenta described such useful anthocyanin color markers as appropriate for "identification of haploid embryos at least by 12 D.A.P. [Days After Pollination]" or "even earlier." *Id.* at 16:17-33, 16:62-67 ("These immature haploid embryos can be used for chromosome doubling purposes.").

26. Third, upon information and belief, the Syngenta Presentation shows that Syngenta contacted the haploid maize embryo with a chromosome doubling agent to produce at least one doubled haploid maize embryo cell, as required by step (c) of claim 1 of the '846 Patent. Slide 26

of the Syngenta Presentation, titled "Chromosome Doubling," shows treatment of the cream-colored haploid maize embryos with a chromosome doubling agent:

See also Ex. C at 16:40-49 (Syngenta stating that maize embryos are "the most suitable plant part . . . for use in chromosome doubling.").

27. Fourth, upon information and belief, the Syngenta Presentation shows that Syngenta cultured the doubled haploid maize embryo cell on a non-callus promoting medium, as required by step (d) of claim 1 of the '846 Patent. On Slide 27, the Syngenta Presentation depicts the culturing of doubled haploid embryos on embryo-rescue media to produce seedlings rather than plant callus tissue. *See also* Ex. A at 8:65-9:7 (describing callus tissues as "dedifferentiated masses of cells or tissue").

28. Fifth, upon information and belief, the Syngenta Presentation shows that Syngenta generated a doubled haploid maize plant from the doubled haploid maize embryo cell, as required by step (e) of claim 1 of the '846 Patent. Slide 31 of the Syngenta Presentation, titled "Production of Doubled Haploid Lines," depicts the further growth of doubled haploid maize plants:

29. Upon information and belief, the Syngenta Presentation shows that Syngenta harvested and collected seed from doubled haploid ("DH") maize produced by the process of

claim 1 of the '846 Patent. Slide 35 describes and shows "Harvest of DH [Maize] Ears." Slide 36 describes and shows "Drying Seeds." Slide 37 describes and shows the shelling and packaging of seed. Slide 45 states that Syngenta has produced 901,896 doubled haploid maize ears using its embryo rescue doubled haploid (ERDH) process.

30. The doubled haploid maize plants and seeds described in the Syngenta Presentation are a product made by the process of at least claim 1 of the '846 Patent. *See* Ex. A at 2:1-3 ("As used herein, the term 'plant' includes reference to whole plants, plant organs (e.g., leaves, stems, roots, etc.), seeds and plant cells and progeny of the same.").

31. Upon information and belief, Syngenta has imported doubled haploid maize plants (including seeds) made by the process of claim 1 of the '846 Patent from at least Guatemala and Chile into the United States. For crops such as maize, the Syngenta Presentation states that the Crop Research Center in Jalapa, Guatemala offers doubled haploid services "for all Syngenta regions." Ex. E at 2, 3, 5. The Syngenta Presentation depicts such Syngenta regions as including the United States. *Id.* at 9-11. Slide 38 of the Syngenta Presentation describes and visually depicts "Storage and Export":

32. Upon information and belief, Syngenta's importation of doubled haploid maize plants (including seeds) made by the process of claim 1 of the '846 Patent is also illustrated by the Syngenta Presentation's description of Syngenta's centralized platform for corn product development. For the first stage of this platform ("CREATE"), the Syngenta Presentation identifies two Syngenta "ERDH Nurseries," located in Arica, Chile and Jalapa, Guatemala, respectively. *Id.* at 9. For the second stage of Syngenta's centralized platform for corn product development ("PRODUCE"), the Syngenta Presentation identifies a hub for conducting trial seed production in Puerto Rico, a U.S. territory. *Id*. On information and belief, Syngenta ships the doubled haploid maize plants (including seeds) made in Guatemala and Chile into at least Puerto Rico for uses including trial seed production. Upon information and belief, Syngenta Seeds, LLC has a branch registered to operate in Puerto Rico for the purpose of producing "new seeds ([including] inbreeds hybrids and varieties)." Ex. F.[3]

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs request that the Court enter judgment in their favor and against Syngenta as follows:

A. A judgment that Syngenta has infringed at least one claim of the '846 Patent under at least 35 U.S.C. § 271(g), either literally or under the doctrine of equivalents;

B. A judgment that the claims of the '846 Patent are valid and enforceable;

C. An award to Plaintiffs of damages adequate to compensate them for Syngenta's past infringement and any continuing or future infringement, including at minimum

[3] Government of Puerto Rico Registry of Corporations and Entities entry for Syngenta Seeds, LLC, https://prcorpfiling.f1hst.com/CorpInfo/CorporationInfo.aspx?c=10202-1512 (last accessed September 29, 2022).

reasonable royalties, together with interest, costs, expenses, and disbursements as justified under 35 U.S.C. § 284;

D. An order enjoining Syngenta, its officers, agents, servants, employees, attorneys, all parent and subsidiary corporations and affiliates, its assigns and successors in interest, and those persons in active concert or participation or privity with Syngenta who receive notice of the injunction, from continuing acts of infringement of the '846 Patent;

E. An order finding that this is an exceptional case and awarding to Plaintiffs their reasonable attorneys' fees and costs pursuant to 35 U.S.C. § 285; and

F. Such other and further relief in law or equity as the Court deems just and appropriate.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiffs demand a trial by jury on all claims and issues so triable.

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