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4743 7590 10/16/2023
MARSHALL, GERSTEIN & BORUN LLP
233 SOUTH WACKER DRIVE
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CHICAGO, IL 60606-6357

EXAMINER	
RAGHU, GANAPATHIRAM	
ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 10/16/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/530,018	11/18/2021	Brian Michael Green	32471/M202647E	3312

TITLE OF INVENTION: METHODS FOR MAKING L-GLUFOSINATE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	01/16/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

Notice of Allowability	Application No. 17/530,018	Applicant(s) Green et al.	
	Examiner GANAPATHIRAMA RAGHU	Art Unit 1652	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/18/2023.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-15. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>06/07/2023; 09/27/2023</u> . 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____.
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/GANAPATHIRAMA RAGHU/ Primary Examiner, Art Unit 1652	10/04/2023
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Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Application Status

In response to Non-FINAL Office Action mailed on 03/16/2023, applicants' response dated 09/18/2023 is acknowledged. Amended claims 1-15 are pending in this application and are now under consideration for examination. **Objections and rejections not reiterated from previous action are hereby withdrawn.**

The Terminal Disclaimer filed on 09/18/2023 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of allowed patents US 10,260,078, US 10,781,465, and US 11,560,577, has been reviewed and accepted. The Terminal Disclaimer has been recorded.

Information disclosure statement

The information disclosure statements (IDS) submitted on 06/07/2023 and 09/27/2023 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the IDS statement is considered and initialed by the examiner.

Withdrawn-Double Patenting rejection

Previous rejections: Claims 1-17 of the instant application rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over: (i) Claims 1-17 of the instant application over claims 1-22 of US 10,260,078 B2, in IDS; (ii) Claims 1-15 of the instant application over claims 1-3 of US 10,781,465, in IDS; and (iii) Claims 1-15 of the instant application over claims 1-18 of US 11,560,577, are being withdrawn due to submission of a Terminal Disclaimer.

Withdrawn-Claim Rejections: 35 USC § 102 (AIA)

Previous rejection of claims 1-4, 6-7 and 16-17 rejected under 35 U.S.C. 102(a)(1) and 35 U.S.C. 102(a)(2) as being anticipated by Long DA., (US 8,445, 406 B2), is being withdrawn due to claim amendments and persuasive arguments (for details, see applicants' arguments/remarks dated 09/18/2023; pages 5-6).

Withdrawn-Claim Rejections: 35 USC § 103 (AIA)

Previous rejection of claims 1-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Long DA., (US 8,445, 406 B2) as applied to claims 1-4, 6-7 and 16-17 (see 35 U.S.C. 102(a)(1) and 35 U.S.C. 102(a)(2) rejection above) and in view of Modaressi et al., (US 8,383, 137 B2), is being withdrawn due to claim amendments and persuasive arguments (for details, see applicants' arguments/remarks dated 09/18/2023; pages 6-7).

Allowable Subject Matter

Claims 1-15 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GANAPATHIRAMA RAGHU whose telephone number is (571)272-4533. The examiner can normally be reached on M-F 8:30am-5pm EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Mondesi can be reached on 408-918-7584. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GANAPATHIRAMA RAGHU/
Primary Examiner, Art Unit 1652

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Brian Michael Green et al.

Application No.: 17/530,018

Confirmation No.: 3312

Filed: November 18, 2021

Art Unit: 1616

For: METHODS FOR MAKING L-GLUFOSINATE

Examiner: G. Raghu

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

INTRODUCTORY COMMENTS

In response to the Office Action dated March 16, 2023, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A herbicidal formulation comprising an L-glufosinate composition wherein said L-glufosinate composition is prepared by reacting D-glufosinate with a D-amino acid oxidase (DAAO) enzyme to form PPO (2-oxo-4-(hydroxy(methyl)phosphinoyl)butyric acid); and

aminating the PPO to L-glufosinate by an enzyme selected from the group consisting of a transaminase (TA), using an amine group from one or more amine donors, and an L-amino acid dehydrogenase (LAAD) enzyme in the presence of an ammonia source,

wherein at least ~~90%~~70% of the D-glufosinate is converted to L-glufosinate,

wherein D-glufosinate is present in an amount of 10% or less by weight of the sum of L-glufosinate, PPO, and D-glufosinate.

and wherein said formulation further comprises at least one adjuvant.

2. (Original) The formulation of claim 1, wherein said at least one adjuvant is selected from the group consisting of a surfactant, a solvent, a polysaccharide humectant, and a diluent.

3. (Original) The formulation of claim 2, wherein said surfactant is sodium alkyl ether sulfate.

4. (Original) The formulation of claim 2, wherein said solvent is selected from group consisting of at least one of 1-methoxy-2-propanol, dipropylene glycol, and ethylene glycol.

5. (Original) The formulation of claim 2, wherein said polysaccharide humectant is selected from group consisting of at least one of alkyl polysaccharides, pentoses, high fructose corn syrup, sorbitol, and molasses.

6. (Original) The formulation of claim 2, wherein said diluent is an aqueous component.

7. (Original) The formulation of claim 2, wherein said diluent is water.

8. (Original) The formulation of claim 1, wherein said L-glufosinate composition comprises L-glufosinate ammonium in an amount from 10-30% by weight of the formulation; and wherein said adjuvant comprises one or more additional components selected from the group consisting of sodium alkyl ether sulfate in an amount from 10-40% by weight of the formulation; 1-methoxy-2-propanol in an amount from 0.5-2% by weight of the formulation; dipropylene glycol in an amount from 4-18% by weight of the formulation; and alkyl polysaccharide in an amount from 4-20% by weight of the formulation; and water as the balance of the formulation.

9. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 31.6% by weight of the formulation; 1-methoxy-2-propanol in an amount of 1% by weight of the formulation; dipropylene glycol in an amount of 8.6% by weight of the formulation; alkyl polysaccharide in an amount of 9.8% by weight of the formulation; and water in an amount of 36.75% by weight of the formulation.

10. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 24.5% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 31.6% by weight of the formulation; 1-methoxy-2-propanol in an amount of 1% by weight of the formulation; dipropylene glycol in an amount of 8.6% by weight of the formulation; alkyl polysaccharide in an amount of 9.8% by weight of the formulation; and water in an amount of 24.5% by weight of the formulation.

11. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; sodium alkyl ether sulfate in an amount of 15.8% by weight of the formulation; 1-methoxy-2-propanol in an amount of 0.5% by weight of the formulation; dipropylene glycol in an amount of 4.3% by weight of the formulation; alkyl polysaccharide in an amount of 4.9% by weight of the formulation; and water in an amount of 62.25% by weight of the formulation.

12. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount from 10-30% by weight of the formulation; and wherein said adjuvant is selected from one or more additional components selected from the group consisting of sodium alkyl ether sulfate in an amount from 10-40%

by weight of the formulation; 1-methoxy-2-propanol in an amount from 0.5-2% by weight of the formulation; and alkyl polysaccharide in an amount from 3-10% by weight of the formulation; and water as the balance of the formulation.

13. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 22.1 % by weight of the formulation; 1-methoxy-2-propanol in an amount of 1 % by weight of the formulation; alkyl polysaccharide in an amount of 6.2% by weight of the formulation; and water in an amount of 58.45% by weight of the formulation.

14. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 24.5% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 22.1 % by weight of the formulation; 1-methoxy-2-propanol in an amount of 1 % by weight of the formulation; alkyl polysaccharide in an amount of 6.2% by weight of the formulation; and water in an amount of 46.2% by weight of the formulation.

15. (Original) The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 11.05% by weight of the formulation; 1-methoxy-2-propanol in an amount of 0.5% by weight of the formulation; alkyl polysaccharide in an amount of 3 .1 % by weight of the formulation; and water in an amount of 73 .1 % by weight of the formulation.

16. (Cancelled)

17. (Cancelled)

REMARKS

Upon entry of this amendment, claims 1-15 will be pending. Claim 1 has been amended to recite that at least 90% of the D-glufosinate is converted to L-glufosinate and that D-glufosinate is present in an amount of 10% or less by weight with respect to the total amount of L-glufosinate, PPO, and D-glufosinate, support for which is found in the application as filed (see, e.g., page 18, lines 20 – page 19, line 6). Claims 16 and 17 have been cancelled. No new matter has been added.

Reconsideration of the rejections is respectfully requested in view of the foregoing amendments and the remarks that follow.

Claim Rejections – Double Patenting

Claims 1-17 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 10,260,078.

Claims 1-15 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 10,781,465.

Claims 1-15 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 11,560,577.

A terminal disclaimer referencing U.S. Patent Nos. 10,260,078; 10,781,465; and 11,560,577 is submitted herewith. In view thereof, Applicant respectfully requests that this rejection be withdrawn.

Claim Rejections – 35 U.S.C. § 102 – Anticipation

Claims 1-4, 6-7, and 16-17 were rejected as being anticipated by **Long** (US 8,445,406). Applicant respectfully traverses based on the amended claims.

Long discloses that the glufosinate used in the aqueous herbicidal formulations is **racemic** glufosinate:

Note that the compounds of formula (I) contain an asymmetric carbon atom. The L enantiomer has been observed to be the biologically active isomer. The formula (I) therefore is intended to encompass all stereoisomers and mixtures thereof, particularly the racemate, and the biologically active enantiomer in each case. Examples of active ingredients of the formula (I) include glufosinate and/or its ammonium salt such as in a racemic mixture; i.e., 2-amino-4-[hydroxy(methyl)phosphinoyl]butanoic acid and its ammonium salt, the L enantiomer of glufosinate and its ammonium salt or other salts such as potassium, sodium, diethylamine, triethylamine, hlanafos/hialaphos; e.g., L-2-amino-4-[hydroxy(methyl)phosphinoyl]butanoyl-L-alaninyl-L-alanine and its sodium salt.

Long at column 3, lines 10-23.

As indicated above, claim 1 has been amended to recite that “**at least 90%** of the D-glufosinate is converted to **L-glufosinate**” and “wherein D-glufosinate is present in an amount of 10% or less by weight of the sum of L-glufosinate, PPO, and D-glufosinate.” Thus, at least 90% of the L-glufosinate composition is L-glufosinate, and the composition cannot have more than 10% of D-glufosinate.

Thus, the recited L-glufosinate composition in amended claim 1 is **not** racemic glufosinate.

In view thereof, the claims are not anticipated by the cited art, and Applicant respectfully requests that the rejection be withdrawn.

Claim Rejections – 35 U.S.C. § 103 – Obviousness

Claims 1-17 were rejected as obvious over Long (US 8,445,406) in view of Modaressi et al. (US 8,383,137). Applicant respectfully traverses based on the amended claims.

As indicated above, **Long** discloses that the glufosinate used in the aqueous herbicidal formulations is **racemic** glufosinate.

However, as also indicated above, claim 1 has been amended such that at least 90% of the L-glufosinate composition is L-glufosinate, and the composition cannot have more than 10% of D-glufosinate.

Thus, none of the cited art (alone or in combination) disclose or suggest the claimed formulation with the recited L-glufosinate composition.

Moreover, attached hereto as Appendix A is additional experimental data that has been performed by Applicant showing that the claimed herbicidal formulation recited in claim 1 has unexpected results.

As shown in Appendix A, tests were carried out using racemic glufosinate and L-glufosinate to determine the phytotoxicity to glufosinate-tolerant soybean at various concentrations (i.e., 300 g/ha, 600 g/ha, and 1200 g/ha). As shown, the L-glufosinate surprisingly resulted in less phytotoxicity to the soybeans than the same amount of racemic glufosinate (i.e., LGA 300 vs. GA 300, etc.) and when comparing the same amounts of L-glufosinate (i.e., LGA 300 vs. GA 600 or LGA 600 vs. GA 1200).

In view of the above, the claimed subject matter is not obvious over the cited art. Applicant respectfully requests that the rejection be withdrawn.

Conclusion

Should the Office have any questions regarding this response or the application, the Office is invited to contact the undersigned at the telephone number indicated below.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 13-2855, under Order No. 32471/M202647E.

Dated: September 18, 2023

Respectfully submitted,

Electronic signature: /Joshua T. Elliott/
Joshua T. Elliott
Registration No.: 43,603
MARSHALL, GERSTEIN & BORUN LLP
233 S. Wacker Drive
6300 Willis Tower
Chicago, Illinois 60606-6357
(312) 474-6300
Attorney for Applicant

APPENDIX A

Additional experimental data

[0001] Methodology - green house experiments

[0002] Greenhouse trials were conducted to evaluate the phytotoxicity of L-glufosinate ammonium. Glufosinate-ammonium (GA) and L-glufosinate-ammonium (LGA) were used as technical grades at 600 g/L. All treatments were applied with an adjuvant Sodium-lauryl-ester-sulfate (SLES) with adjuvant ratios typically used in commercial with Glufosinate formulations. The treatments were applied with a track sprayer using flat fan nozzles, a water volume of 200 L/ha and one replicate per treatment.

[0003] The herbicide combinations were applied post-emergence to soybeans at growth stage GS13. Two glufosinate-tolerant soybean cultivars were used: (i) GLXMA (S1) – CZ 1660 GTLL and (ii) GLXMA (S1) – CZ 3519 GTLL. A visual crop injury assessment (i.e., % crop injury compared to an untreated control) was made at 7 days after treatment (DAT).

[0004] Experimental Results – greenhouse

[0005] The results of the phytotoxicity experiment are summarized in table 2e below. Surprisingly, all LGA treatments are causing less phytotoxicity than respective GA treatments applied at the same molecular weight. There is some difference in sensitivity to glufosinate between the two soybean varieties but the difference in crop response from LGA as compared to GA is visible in both varieties and at all three application rates 300, 600 and 1200 g/ha. This was not expected.

Table 2e: Ratings of herbicidal activity (phytotoxicity) in an greenhouse experiment against the above mentioned glufosinate tolerant soybeans (GLXMA) after a single post-emergence treatments with racemate glufosinate-ammonium (GA) and L-glufosinate-ammonium (LGA) rated 7 DAA.

Field crop	LGA 300 g/ha	GA 300 g/ha	LGA 600 g/ha	GA 600 g/ha	LGA 1200 g/ha	GA 1200 g/ha
GLXMA (CZ1660)	0	5	10	15	10	40
GLXMA (CZ3519)	5	10	10	35	15	70
average	2.5	7.5	10	25	12.5	55



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/530,018	11/18/2021	Brian Michael Green	32471/M202647E	3312
4743	7590	03/16/2023	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP			RAGHU, GANAPATHIRAM	
233 SOUTH WACKER DRIVE			ART UNIT	PAPER NUMBER
6300 WILLIS TOWER			1652	
CHICAGO, IL 60606-6357			NOTIFICATION DATE	DELIVERY MODE
			03/16/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mgbdoCKET@marshallip.com

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Detailed Action

Claims 1-17 are pending in this application and are now under consideration.

Priority

This application is a CON of 16/997,133 filed on 08/19/2020 now US Patent 11,560,577, which is a CON of 16/287,290 filed on 02/27/2019 now US Patent 10,781,465, which is a CON of 15/787,448 filed on 10/18/2017 now US Patent 10,260,078, which is a DIV of 15/445,254 filed on 02/28/2017 now US Patent 9,834,802 and applicants' claim for the benefit of priority under 35 U.S.C. 119(e) to the Provisional Applications: 62/302,421 filed on 03/02/2016; 62/336,989 filed on 05/16/2016; and 62/413,240 filed on 10/26/2016 is acknowledged.

Information disclosure statement

The information disclosure statements (IDS) submitted on 04/07/22, 09/01/22 and 02/16/23 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the IDS statements are considered and initialed by the examiner.

Double Patenting rejection

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-17 of the instant application are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over: (i) Claims 1-17 of the instant application over claims 1-22 of US 10,260,078 B2, in IDS; (ii) Claims 1-15 of the instant application over claims 1-3 of US 10,781,465, in IDS; and (iii) Claims 1-15 of the instant application over claims 1-18 of US 11,560,577. An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim, because the examined claim is either anticipated by, or would have been obvious over reference claim. See, e.g., *In re Berg*, 140 F.3d 1428,46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir.1993); *In re Longi* 759 F.2d 887,225 USPQ 645 (Fed. Cir. 1985). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 1-17 of the instant application cannot be considered patentably distinct over: (i) Claims 1-17 of the instant application over claims 1-22 of US 10,260,078 B2, in IDS; (ii) Claims 1-15 of the instant application over claims 1-3 of US 10,781,465, in IDS; and (iii) Claims 1-15 of the instant application over claims 1-18 of US 11,560,577 when there is specifically disclosed embodiments and falls within the scope of the instant claims 1-17 herein. In the instant case, the allowed patents specification and the allowed

patents, i.e., (i) claims 1-22 of US 10,260,078 B2, in IDS; (ii) claims 1-3 of US 10,781,465, in IDS; and (iii) claims 1-18 of US 11,560,577 discloses as a preferred embodiment and are directed to "...L-glufosinate ...". Regarding rejection of claims 1-17 over allowed patents (i) claims 1-22 of US 10,260,078 B2, in IDS; (ii) claims 1-3 of US 10,781,465, in IDS; and (iii) claims 1-18 of US 11,560,577, examiner takes the position that the product claims of US 10,260,078 B2 and the method claims of US 10,781,465 and US 11,560,577 and the product and method claims 1-17 of the instant application is a different form/version of the allowed patent claims; examiner also notes in said allowed patents there was no restriction in place for "a method of making L-glufosinate ...". Therefore, the product and method claims 1-17 of the instant invention are deemed as an obvious variation of the inventions of allowed patents claims: (i) Claims 1-17 of the instant application over claims 1-22 of US 10,260,078 B2, in IDS; (ii) Claims 1-15 of the instant application over claims 1-3 of US 10,781,465, in IDS; and (iii) Claims 1-15 of the instant application over claims 1-18 of US 11,560,577.

Claim Rejections: 35 USC § 102 (AIA)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

(a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection **will not be considered** a new ground of

rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claims 1-4, 6-7 and 16-17 are rejected under 35 U.S.C. 102(a)(1) and 35 U.S.C. 102(a)(2) as being anticipated by Long DA., (US 8,445, 406 B2), when given the broadest reasonable interpretation.

Claims 1-4, 6-7 and 16-17 as interpreted are directed to product by process claims i.e., a herbicidal formulation comprising an L-glufosinate composition is prepared by reacting... wherein said formulation further comprises at least one adjuvant... .

The recitation in the preamble has not given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a processes or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The rejected claims are deemed to be “Product by Process” claims and the product is already disclosed in the prior art and no patentable weight is given to the process by which the product is made and claims use open-ended transitional term “comprising” which is inclusive of additional, unrecited elements.

Long DA., (US 8,445, 406 B2) disclose stable concentrated herbicidal composition comprising surfactant alkyl ether sulfate (Abstract; and entire document); L-enantiomer glufosinate and its salt (col. 2, lines, 39-67; col. 3, lines 10-23) in an amount 20%-35% (col. 3, lines 24-34); surfactant alkyl ether sulfate (col. 3, lines 35-54); said composition further comprising organic solvent such as methanol, ethanol, propanol, ... ethylene glycol (col. 3, lines 55-67 to col. 5, lines 1-35; Examples 1 to 9, Table, col. 6; Examples 10 to 12, col. 7-8; Table Examples 13-14, col. 9-10).

Therefore, the reference of Long DA., (US 8,445, 406 B2) is deemed to anticipate claims 1-4, 6-7 and 16-17 as written and when given the broadest reasonable interpretation.

Since the Office does not have the facilities for examining and comparing applicants' composition with the composition of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed product and the product of the prior art (i.e., that the composition of the prior art does not possess the same material structural and functional characteristics of the composition of the instant invention). See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and *In re Fitzgerald et al.*, 205 USPQ 594.

Claim Rejections: 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long DA., (US 8,445, 406 B2) as applied to claims 1-4, 6-7 and 16-17 (see 35 U.S.C. 102(a)(1))

and 35 U.S.C. 102(a)(2) rejection above) and in view of Modaressi et al., (US 8,383, 137 B2).

The disclosure of Long DA., (US 8,445, 406 B2) as applied to claims 1-4, 6-7 and 16-17 is described above in 35 U.S.C. 102(a)(1) and 35 U.S.C. 102(a)(2) rejection above. However, Long DA., is silent regarding wherein said polysaccharide humectant is selected from group consisting of at least one of alkyl polysaccharides, pentoses, high fructose corn syrup, sorbitol, and molasses (as in claim 5); and wherein said L-glufosinate composition comprises L-glufosinate ammonium in an amount from 10-30% by weight of the formulation... (as in claims 8-15).

Regarding claim 5, analogous art Modaressi et al., (US 8,383, 137 B2) teach the structural and functional information regarding herbicidal compositions comprising adjuvants and humectants, wherein said compositions comprising herbicide glufosinate and polysaccharide humectant is selected from group consisting of at least one of alkyl polysaccharides, pentoses, high fructose corn syrup, sorbitol, and molasses (see Abstract; col. 1, lines 15-26; col. 2, lines 52-62; glufosinate, col. 4, lines 10-20; and entire document).

Regarding claims 8-15, the following references teach the structural and functional elements of the instant invention: Long DA., (US 8,445, 406 B2) disclose L-enantiomer glufosinate and its salt (col. 2, lines, 39-67; col. 3, lines 10-23) in an amount 20%-35% (col. 3, lines 24-34) and Modaressi et al., (US 8,383, 137) also teach herbicidal compositions wherein the active herbicide concentration at ~37.4% and application of said herbicide in field trials (see col. 7, lines 30-67).

Therefore, it would have been obvious to a person of ordinary skill in the art to combine and modify the teachings of Long DA., and employ the compositions comprising herbicide glufosinate and polysaccharide humectant is selected from group consisting of at least one of alkyl polysaccharides, pentoses, high fructose corn syrup, sorbitol, and molasses of Modaressi et al., that teach structural and functional elements of the instant invention, and the expectation of success is high, because the combined teachings provide teaching, suggestion and motivation.

Examiner also finds support in: MPEP 2144.05 [R-5]: Optimization Within Prior Art Conditions or Through Routine Experimentation Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the *prima facie* case of obviousness. See *In re Boesch*, 617 F.2d 272,276,205 USPQ 215,219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), and *In re Aller*, 220 F2d 454,456,105 USPQ 233,235 (CCPA 1955).

Therefore, claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long DA., (US 8,445, 406 B2) as applied to claims 1-4, 6-7 and 16-17 (see 35 U.S.C. 102(a)(1) and 35 U.S.C. 102(a)(2) rejection above) and in view of Modaressi et al., (US 8,383, 137 B2).

Allowable Subject Matter/Conclusion

None of the claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GANAPATHIRAMA RAGHU whose telephone number is (571)272-4533. The examiner can normally be reached on M-F 8:30am-5pm EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Mondesi can be reached on 408-918-7584. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GANAPATHIRAMA RAGHU/
Primary Examiner, Art Unit 1652



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
17/530,018	11/18/2021	1616	1820	32471/M202647E	17	1

CONFIRMATION NO. 3312

FILING RECEIPT

4743

MARSHALL, GERSTEIN & BORUN LLP
233 SOUTH WACKER DRIVE
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Date Mailed: 11/24/2021

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

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Applicant(s)

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Power of Attorney: The patent practitioners associated with Customer Number 04743

Domestic Priority data as claimed by applicant

This application is a CON of 16/997,133 08/19/2020
which is a CON of 16/287,290 02/27/2019 PAT 10781465
which is a CON of 15/787,448 10/18/2017 PAT 10260078
which is a DIV of 15/445,254 02/28/2017 PAT 9834802
which claims benefit of 62/302,421 03/02/2016 ABN
and claims benefit of 62/336,989 05/16/2016 ABN
and claims benefit of 62/413,240 10/26/2016 ABN

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 11/22/2021

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/530,018**

Projected Publication Date: 03/03/2022

Non-Publication Request: No

Early Publication Request: No

Title

METHODS FOR MAKING L-GLUFOSINATE

Preliminary Class

504

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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Application Data Sheet

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Correspondence Information

Correspondence Customer Number:: 04743

Application Information

Application Type:: Nonprovisional

Subject Matter:: Utility

CD-ROM or CD-R?:: None

Sequence submission?:: Yes

Computer Readable Form (CRF)?:: Yes

Title:: METHODS FOR MAKING L-
GLUFOSINATE

Attorney Docket Number:: 32471/M202647E

Request for Early Publication?:: No

Request for Non-Publication?:: No

Total Drawing Sheets:: 2

Small Entity?:: No

Petition included?:: No

Portions or all of the application associated with this
Application Data Sheet may fall under a Secrecy
Order pursuant to 37 CFR 5.2:: No

Representative Information

Representative Customer Number:: 04743

Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::	Prior Appl Status::
This Application	Continuation of	16/997,133	08/19/20	Pending
16/997,133	Continuation of	16/287,290	02/27/19	Patented
16/287,290	Continuation of	15/787,448	10/18/17	Patented
15/787,448	Division of	15/445,254	02/28/17	Patented
15/445,254	Claims benefit of provisional	62/413,240	10/26/16	Expired
15/445,254	Claims benefit of provisional	62/336,989	05/16/16	Expired
15/445,254	Claims benefit of provisional	62/302,421	03/02/16	Expired

Foreign Priority Information

Applicant Information

Applicant Number:: 1

Applicant Type:: Assignee

Organization Name:: BASF SE

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Postal or Zip Code of mailing address:: 67056

WHAT IS CLAIMED IS:

1. A herbicidal formulation comprising an L-glufosinate composition wherein said L-glufosinate composition is prepared by reacting D-glufosinate with a D-amino acid oxidase (DAAO) enzyme to form PPO (2-oxo-4-(hydroxy(methyl)phosphinoyl)butyric acid); and
5 aminating the PPO to L-glufosinate by an enzyme selected from the group consisting of a transaminase (TA), using an amine group from one or more amine donors, and an L-amino acid dehydrogenase (LAAD) enzyme in the presence of an ammonia source,
 wherein at least 70% of the D-glufosinate is converted to L-glufosinate, and wherein said formulation further comprises at least one adjuvant.
- 10 2. The formulation of claim 1, wherein said at least one adjuvant is selected from the group consisting of a surfactant, a solvent, a polysaccharide humectant, and a diluent.
3. The formulation of claim 2, wherein said surfactant is sodium alkyl ether sulfate.
4. The formulation of claim 2, wherein said solvent is selected from group consisting of at least one of 1-methoxy-2-propanol, dipropylene glycol, and ethylene glycol.
- 15 5. The formulation of claim 2, wherein said polysaccharide humectant is selected from group consisting of at least one of alkyl polysaccharides, pentoses, high fructose corn syrup, sorbitol, and molasses.
6. The formulation of claim 2, wherein said diluent is an aqueous component.
7. The formulation of claim 2, wherein said diluent is water.
- 20 8. The formulation of claim 1, wherein said L-glufosinate composition comprises L-glufosinate ammonium in an amount from 10-30% by weight of the formulation; and wherein said adjuvant comprises one or more additional components selected from the group consisting of sodium alkyl ether sulfate in an amount from 10-40% by weight of the formulation; 1-methoxy-2-propanol in an amount from 0.5-2% by weight of the formulation; dipropylene glycol in an
25 amount from 4-18% by weight of the formulation; and alkyl polysaccharide in an amount from 4-20% by weight of the formulation; and water as the balance of the formulation.
9. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said

adjuvant comprises sodium alkyl ether sulfate in an amount of 31.6% by weight of the formulation; 1-methoxy-2-propanol in an amount of 1% by weight of the formulation; dipropylene glycol in an amount of 8.6% by weight of the formulation; alkyl polysaccharide in an amount of 9.8% by weight of the formulation; and water in an amount of 36.75% by weight of the formulation.

10. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 24.5% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 31.6% by weight of the formulation; 1-methoxy-2-propanol in an amount of 1% by weight of the formulation; dipropylene glycol in an amount of 8.6% by weight of the formulation; alkyl polysaccharide in an amount of 9.8% by weight of the formulation; and water in an amount of 24.5% by weight of the formulation.

11. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; sodium alkyl ether sulfate in an amount of 15.8% by weight of the formulation; 1-methoxy-2-propanol in an amount of 0.5% by weight of the formulation; dipropylene glycol in an amount of 4.3% by weight of the formulation; alkyl polysaccharide in an amount of 4.9% by weight of the formulation; and water in an amount of 62.25% by weight of the formulation.

12. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount from 10-30% by weight of the formulation; and wherein said adjuvant is selected from one or more additional components selected from the group consisting of sodium alkyl ether sulfate in an amount from 10-40% by weight of the formulation; 1-methoxy-2-propanol in an amount from 0.5-2% by weight of the formulation; and alkyl polysaccharide in an amount from 3-10% by weight of the formulation; and water as the balance of the formulation.

13. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 22.1% by weight of the formulation; 1-methoxy-2-propanol in an amount of 1% by weight of the formulation; alkyl polysaccharide in an amount of 6.2% by weight of the formulation; and water in an amount of 58.45% by weight of the formulation.

14. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 24.5% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 22.1 % by weight of the formulation; 1-methoxy-2-propanol in an amount of 1 % by weight of the formulation; alkyl polysaccharide in an amount of 6.2% by weight of the formulation; and water in an amount of 46.2% by weight of the formulation.

15. The formulation of claim 1, wherein the L-glufosinate composition comprises L-glufosinate ammonium in an amount of 12.25% by weight of the formulation; and wherein said adjuvant comprises sodium alkyl ether sulfate in an amount of 11.05% by weight of the formulation; 1-methoxy-2-propanol in an amount of 0.5% by weight of the formulation; alkyl polysaccharide in an amount of 3.1 % by weight of the formulation; and water in an amount of 73.1 % by weight of the formulation.

16. A method for selectively controlling weeds in an area comprising:
applying an effective amount of the formulation of claim 1 at an enantiomeric excess of greater than 90% over D-glufosinate to the area.

17. The method of claim 16, wherein the effective amount of the formulation is applied at less than 400 grams of the sum of L-glufosinate and D-glufosinate per hectare.