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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY


WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCESOPP OFFICIAL RECORD
HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361MEMORANDUM

Date: 5-March-2008

Subject: **Glyphosate.** Section 3 Registration for Application to Transgenic Soybean.
Request for Petition Method Validation (PMV).

DP#:	349696	Decision#:	372859
PC Code:	103601, 417300	Registration #:	352-606
40 CFR 180.	364		

From: Tom Bloem, Chemist 
Registration Action Branch (RAB1); Health Effects Division (HED) (7509P)Through: George F. Kramer, Ph.D. Senior Chemist 
RAB1/HED (7509P)To: William Chism, Ph.D., Chief
Analytical Chemistry Laboratory (ACL)
Biological & Economic Analysis Division (BEAD) (7503P)

DuPont requested a Section 3 registration for the preplant application of glyphosate and pyriithobac sodium to glyphosate-tolerant soybean. The petitioner is also working to commercialize a genetically modified soybean designated as Optimum™ GAT™ soybean (DP-356043-5). The petitioner indicated that Optimum™ GAT™ soybean was engineered to express the microbial glyphosate acetyltransferase gene (*gat4601*), which confers tolerance to glyphosate via acetylation of the secondary amine group of glyphosate, and the *gm-hra* gene, which confers tolerance ALS inhibiting herbicides via encoding for an ALS protein which is not sensitive to the ALS inhibiting herbicides. As a result of the introduction of this genetically modified soybean, the petitioner is requesting that the glyphosate tolerance expression (40 CFR 180.364(a)) be altered from glyphosate *per se* to the combined residues of glyphosate and N-acetyl-glyphosate (no changes in the pyriithobac sodium tolerance expression or tolerances is requested). HED has reviewed the residue chemistry data submitted in support of this request and agreed with the change in the glyphosate tolerance expression and concluded that the numerical value of the currently-established glyphosate tolerances will not change for all commodities excluding soybean hull (increase from 100 ppm to 120 ppm) and aspirated grain fraction (increase from 100 ppm to 310 ppm). In addition, HED concluded that the tolerance expression and numerical values of the currently-established pyriithobac sodium tolerances are adequate.

To enforce the proposed glyphosate tolerances, the petitioner proposed liquid chromatograph/mass spectrometer/mass spectrometer (LC/MS/MS) methods 15444 (plants) and 20009 (livestock). These methods have been adequately validated by the petitioner and have

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undergone successful independent laboratory validation (ILV; see attachment 3). Adequate radiovalidation for residues of glyphosate *per se* have been submitted for method 15444 (HED will request radiovalidation data for *N*-acetyl-glyphosate). Radiovalidation have also been submitted for the livestock enforcement method; however, since the samples used to radiovalidate the method were derived from a metabolism study which has not been submitted to HED, the adequacy of these data can not be determined (HED will request the metabolism study).

RAB1 requests that ACL/BEAD conduct a PMV of the proposed glyphosate plant and livestock tolerance enforcement methods. Since ACL is better informed in the analysis of crop/livestock samples and the potential pitfalls, HED will let the ACL determine which crop commodities and fortification levels to use for validation; HED only requests that the chosen matrices encompass the registered varieties and that the glyphosate and *N*-acetyl-glyphosate fortification levels encompass the current tolerance levels (see attachment 1 for commodities and tolerance levels). Please include in your report all relevant information and supporting documentation concerning the method validation, including modifications which were made, and indicate the suitability of the analytical method for enforcement purposes. Please include the Repository Ordering Code for the reference standards. Since one of the purposes of conducting an in-house PMV is to determine whether all necessary instructions are included in the submitted proposed enforcement method, your laboratory staff scientists should have minimal contact with the petitioner during the conduct of this trial. Any problems encountered in the method as written should be documented and included in your report. The petitioner will be informed of any deficiencies in the method and asked to resolve them. The RD Product Manager for glyphosate is James Tompkins. He should be contacted directly (703-305-5697) if you require guidance concerning the priority for initiation/completion of this PMV.

Please address and send your report to Dana Vogel, Acting Branch Chief, RAB1/HED, 7509P. If you need any further information, please call me at 703-605-0217.

Attachment 1: Proposed tolerances

Attachment 2: Bean sheet for PMV request (DP #: 335559; not available electronically)

Attachment 3: CD containing the following studies:

47007908 Pentz, A.; Bramble, F. (2006) Analytical Method for the Determination of Glyphosate and Relevant Metabolite Residues in Various Crop Matrices Using LC/MS/MS. Lab Project ID: DuPont-15444. Unpublished study prepared by E.I du Pont de Nemours and Company. 95 pages.

47119204 Seal, S.; Dillon, R. (2007) Independent Laboratory Validation of DuPont-15444, "Analytical Method for the Determination of Glyphosate and Relevant Metabolite Residues in Various Crop Matrices Using LC/MS/MS." Lab Project ID: 1763. DuPont Project ID. DuPont-21313. Unpublished study prepared by Pyxant Labs Inc. 101 pages.

RDI: RAB1 Chemists (27-Feb-2007)
T. Bloem:S10945:PY1:(703)605-0217:7509P:RAB1

Attachment 1: Proposed Tolerances

Proposed tolerance for the combined residues of glyphosate and N-acetyl-glyphosate. Note that the numerical value of these tolerances are identical to the currently established glyphosate *per se* tolerance for all commodities excluding soybean hulls (increased from 100 ppm to 120 ppm) and aspirated grain fractions (increased from 100 ppm to 310 ppm).

Commodity	Parts per million
Acerola	0.2
Alfalfa, seed	0.5
Almond, hulls	25
Aloe vera	0.5
Ambarella	0.2
Animal feed, nongrass, group 18	400
Artichoke, globe	0.2
Asparagus	0.5
Atemoya	0.2
Avocado	0.2
Bamboo, shoots	0.2
Banana	0.2
Barley, bran	30
Barley, grain	20
Beet, sugar, dried pulp	25
Beet, sugar, roots	10
Beet, sugar, tops	10
Berry group 13	0.2
Betelnut	1.0
Biriba	0.2
Blimbe	0.2
Borage, seed	0.1
Breadfruit	0.2
Cacao bean	0.2
Cactus, fruit	0.5
Cactus, pads	0.5
Canistel	0.2
Canola, meal	15
Canola, seed	10
Cattle, kidney	4.0
Cattle, liver	0.5
Chaya	1.0
Cherimoya	0.2
Citrus, dried pulp	1.5
Coconut	0.1
Coffee, bean	1.0
Corn, field, forage	6.0
Corn, field, grain	1.0
Cotton, gin byproducts	175
Cotton, undelinted seed	35
Cranberry	0.2

Commodity	Parts per million
Crambe, seed	0.1
Custard apple	0.2
Date	0.2
Dokudami	2.0
Durian	0.2
Egg	0.05
Epazote	1.3
Feijoa	0.2
Fig	0.2
Fish	0.25
Flax, meal	8.0
Flax, seed	4.0
Fruit, citrus, group 10	0.5
Fruit, pome, group 11	0.2
Fruit, stone, group 12	0.2
Galangal, roots	0.2
Ginger, white, flower	0.2
Goat, kidney	4.0
Goat, liver	0.5
Gourd, buffalo, seed	0.1
Governor's plum	0.2
Gow kee, leaves	0.2
Grain, aspirated fractions	310
Grain, cereal, forage, fodder and straw, group 16, except corn forage	100
Grain, cereal, group 15, except barley, field corn, grain sorghum, oat and wheat	0.1
Grape	0.2
Grass, forage, fodder and hay, group 17	300
Guava	0.2
Herbs subgroup 19A	0.2
Hog, kidney	4.0
Hog, liver	0.5
Hop, dried cones	7.0
Horse, kidney	4.0
Horse, liver	0.5
Ilama	0.2
Imbe	0.2
Imbu	0.2
Jackfruit	0.2
Jaboticaba	0.2
Jojoba, seed	0.1
Juneberry	0.2
Kava, roots	0.2
Kenaf, forage	200
Kiwifruit	0.2
Lesquerella, seed	0.1
Leucaena, forage	200
Lingonberry	0.2
Longan	0.2

Commodity	Parts per million
Lychee	0.2
Mamey apple	0.2
Mango	0.2
Mangosteen	0.2
Marmaladebox	0.2
Meadowfoam, seed	0.1
Mioga, flower	0.2
Mustard, seed	0.1
Noni	0.20
Nut, pine	1.0
Nut, tree, group 14	1.0
Oat, grain	20
Okra	0.5
Olive	0.2
Oregano, Mexican, leaves	2.0
Palm heart	0.2
Palm heart, leaves	0.2
Palm, oil	0.1
Papaya	0.2
Papaya, mountain	0.2
Passionfruit	0.2
Pawpaw	0.2
Pea, dry	8.0
Peanut	0.1
Peanut, hay	0.5
Pepper leaf, fresh leaves	0.2
Peppermint, tops	200
Perilla, tops	1.8
Persimmon	0.2
Pineapple	0.1
Pistachio	1.0
Pomegranate	0.2
Poultry, meat	0.1
Poultry, meat byproducts	1.0
Pulasan	0.2
Quinoa, grain	5.0
Rambutan	0.2
Rapeseed, meal	15
Rapeseed, seed	10
Rose apple	0.2
Safflower	85
Safflower, seed	0.1
Salal	0.2
Sapodilla	0.2
Sapote, black	0.2
Sapote, mamey	0.2
Sapote, white	0.2
Sesame, seed	0.1

Commodity	Parts per million
Sheep, kidney	4.0
Sheep, liver	0.5
Shellfish	3.0
Sorghum, grain, grain	15
Soursop	0.2
Soybean, forage	100
Soybean, hay	200
Soybean, hulls	120
Soybean, seed	20
Spanish lime	0.2
Spearmint, tops	200
Spice subgroup 19B	7.0
Star apple	0.2
Starfruit	0.2
Stevia, dried leaves	1.0
Strawberry	0.2
Sugar apple	0.2
Sugarcane, cane	2.0
Sugarcane, molasses	30
Sunflower	85
Sunflower, seed	0.1
Surinam cherry	0.2
Tamarind	0.2
Tea, dried	1.0
Tea, instant	7.0
Teff, grain	5.0
Ti, leaves	0.2
Ti, roots	0.2
Ugli fruit	0.5
Vegetable, leafy, brassica, group 5	0.2
Vegetable, bulb, group 3	0.2
Vegetable, cucurbit, group 9	0.5
Vegetable, foliage of legume, except soybean, subgroup 7A	0.2
Vegetable, fruiting, group 8	0.1
Vegetable, leafy, except brassica, group 4	0.2
Vegetable, leaves of root and tuber, group 2, except sugar beet tops	0.2
Vegetable, legume, group 6, except soybean	5.0
Vegetable, legume, group 6 except soybean and pea, dry	5.0
Vegetable, root and tuber, group 1, except sugar beet	0.2
Wasabi, roots	0.2
Water spinach, tops	0.2
Watercress, upland	0.2
Wax jambu	0.2
Wheat, bran	20
Wheat, grain	5.0
Wheat, middlings	20
Wheat, shorts	20
Yacon, tuber	0.2

Attachment 2: Bean Sheet for PMV Request (DP #: 349697)

DATA PACKAGE BEAN SHEET

Decision #: 372859
DP #: (349697)
PRIA
Parent DP#: 346713

***** Registration Information *****

Registration: 352-606 - DUPONT STAPLE PLUS HERBICIDE

Company: 352 - E. I. DU PONT DE NEMOURS AND CO. INC.

Risk Manager: RM 25 - James Tompkins - (703) 305-5697 Room# P Y1 S-7337

Risk Manager Reviewer: Thomas Bloan TBLDEM

Sent Date: _____ Calculated Due Date: 30-Mar-2008 Edited Due Date: _____

Type of Registration: Product Registration - Section 3

Action Desc: (R17) NEW USE/EACH ADDITIONAL NEW FOOD USE:

Ingredients: 078905, Pyriithioac(1.7%)

103601, Glyphosate-isopropylammonium(40.2%)

***** Data Package Information *****

Expedite: Yes No Date Sent: 21-Feb-2008 Due Back: _____

DP Ingredient: 078905, Pyriithioac

103601, Glyphosate-isopropylammonium

DP Title: _____ Label Included: Yes No Parent DP #: 346713

CSF Included: Yes No

Assigned To: _____ Date In: _____ Date Out: _____

Organization: BEAD / ACL Last Possible Science Due Date: 02-Oct-2007

Team Name: _____ Science Due Date: _____

Reviewer Name: _____ Sub Data Package Due Date: _____

Contractor Name: _____

***** Studies Sent for Review *****

No Studies

***** Additional Data Package for this Decision *****

Printed on Page 2

***** Data Package Instructions *****

please perform a PMV on the submitted method see HED memo D344966

Attachment 3: CD containing the following studies:

MRID 47007908. Pentz, A.; Bramble, F. (2006). Analytical Method for the Determination of Glyphosate and Relevant Metabolite Residues in Various Crop Matrices Using LC/MS/MS. Lab Project ID: DuPont-15444. Unpublished study prepared by E.I du Pont de Nemours and Company. 95 pages.

MRID 47119204 Seal, S.; Dillon, R. (2007). Independent Laboratory Validation of DuPont-15444, "Analytical Method for the Determination of Glyphosate and Relevant Metabolite Residues in Various Crop Matrices Using LC/MS/MS." Lab Project ID: 1763. DuPont Project ID. DuPont-21313. Unpublished study prepared by Pyxant Labs Inc. 101 pages.

MRID 47311011. Pentz, A.; Bramble, F. (2007). Analytical Method for the Determination of N-Acetylglyphosate and Other Analytes in Various Animal Matrices Using LC/MS/MS. Project Identifier: DuPont-20009. Unpublished study prepared by E.I du Pont de Nemours and Company. 96 pages.

MRID 47311012 Karnik, S.; Dillon, R. (2007). Independent Laboratory Validation of DuPont-20009, "Analytical Method for the Determination of N-Acetylglyphosate and Other Analytes in Various Animal Matrices Using LC/MS/MS." DuPont Project ID: DuPont-21372. Unpublished study prepared by Pyxant Labs Inc. 172 pages.



13544

R158194

Chemical: Glyphosate-isopropylammonium
Glyphosate

PC Code:

103601

417300

HED File Code: 11500 Petition Files Chemistry

Memo Date: 3/5/2008

File ID: DPD349696

DPD349697

DPD335559

DPD346713

DPD078905

Accession #: 000-00-0124

HED Records Reference Center

3/31/2008