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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OFFICIAL RECORD
 WASHINGTON, D.C. 20460
 HEALTH EFFECTS DIVISION
 SCIENTIFIC DATA REVIEWS
 EPA SERIES 361

OCT 27 1992

OFFICE OF
 PREVENTION, PESTICIDES
 AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Glyphosate: List A Reregistration Case No. 0718: Product and Residue Chemistry Chapters For The Reregistration Eligibility Document (RED). CBRS No. 10,665, DP Barcode No. D183202.

FROM: R. B. Perfetti, Ph.D., Chemist *R. B. Perfetti*
 Reregistration Section I
 Chemistry Branch II: Reregistration Support
 Health Effects Division (H7509C)

THRU: Edward Zager, Chief *E. Zager*
 Chemistry Branch II: Reregistration Support
 Health Effects Division (H7509C)

TO: J. Smith and E. Saito, Acting Chief
 Science Analysis and Coordination Branch
 Health Effects Division (H7509C)

Attached are the Glyphosate Product and Residue Chemistry Chapters for the Glyphosate RED. These chapters were completed by Dynamac Corporation under supervision of CBRS, HED. They have undergone secondary review in the branch and have been revised to reflect Agency policies.

There is currently a question regarding Craven Laboratories data for certain crops having glyphosate uses (See memo of 10/21/91, M. Metzger, CBRS # 8367, Barcode No. D167350.). Additional requirements may be levied pending the final disposition of the Craven data question.

If you need additional input please advise.

Attachments 1 and 2: Glyphosate Product and Residue Chemistry RED Chapters.

cc (With Attachments 1 and 2): RBP, Glyphosate Reregistration Standard File, Glyphosate Subject File, Circ. and Dynamac.

cc (Without Attachments): RF.

DYNAMAC
CORPORATION
Environmental Services

Final Report

GLYPHOSATE
Shaughnessy Nos. 103601 & 103603
Case No. 0178

Task 2A - Reregistration Eligibility
Document: Product Chemistry
Considerations

October 22, 1992

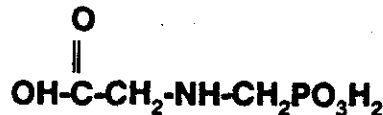
Contract No. 68-D2-0053

Submitted to:
U.S. Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
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Rockville, MD 20850-3268

GLYPHOSATEREREGISTRATION ELIGIBILITY DOCUMENT:PRODUCT CHEMISTRY CONSIDERATIONS(Shaughnessy Nos. 103601 and 103603; Case No. 0178)TASK 2ADESCRIPTION OF CHEMICAL

Glyphosate (N-phosphonomethyl glycine) is a nonselective herbicide and plant growth regulator.



Empirical Formula: $\text{C}_3\text{H}_8\text{NO}_5\text{P}$
 Molecular Weight: 169.07
 CAS Registry No.: 38641-94-0
 Shaughnessy No.: 103601 (isopropylamine salt, IPA)
 103603 (sodium salt)

IDENTIFICATION OF ACTIVE INGREDIENT

The technical isopropylamine salt (IPA) is a white crystalline solid with a melting point of 200 C and a bulk density of 1.74. It is 1% soluble in water at 25 C and insoluble in ethanol, acetone, or benzene. The technical sodium salt is a white crystalline solid which decomposes at 140 C with a bulk density of 30 lb/ft³.

MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 7/20/92 identified four glyphosate manufacturing-use products (MPs) registered to Monsanto Agricultural Company under Shaughnessy No. 103601. There are no registered MPs under Shaughnessy No. 103603. We note that according to the Glyphosate Registration Standard Update dated 4/26/90, two of the products identified as MPs in REFS, the 53.5% IFA formulation intermediate (FI; EPA Reg. No. 524-318) and the 41% IPA FI (EPA Reg. No. 524-339) are actually end-use products (EPs). A list of the Monsanto MPs subject to a reregistration eligibility decision is presented below. Data pertaining to the unregistered IPA acid technical (formerly referenced as the unregistered IPA salt

technical in the Science Chapter) and the unregistered trisodium salt technical are also required to satisfy data requirements for reregistration.

Formulation	EPA Reg. No.
62% IPA FI ^a	524-333
94% IPA FI	524-420
75% IPA T	524-421

a. This product is identified as an EP in REFS; an Agency review (CBRS Nos. 2346 and 2347, 9/1/87), concluded that it would be more appropriately designated a technical product.

REGULATORY BACKGROUND

The regulatory background for glyphosate products in terms of comprehensive product chemistry reviews is presented below.

Products	July 1986 Guidance Document		April 1990 Update	
	Data required	Data submitted in response	Data required	Data submitted in response
Unregistered trisodium salt technical	61-2, -3 62-1, -2*, -3* 63-4, -7, -8, -9, -11, -12, -13	none	none; not addressed in the Update	n/a ^a
Unregistered IPA acid technical	61-2, -3 62-1, -2*, -3* 63-4, -7, -8, -9, -11, -12, -13	61-2, -3 62-1 63-2 through -13	none	n/a

Products	July 1986 Guidance Document		April 1990 Update	
	Data required	Data submitted in response	Data required	Data submitted in response
62% IPA FI	61-2, -3 62-1, -2, -3 no 63 series; not reviewed for MPs in G.D.	61-1, -2, -3 62-1, -2, -3 63-2, -3, -4, -7, -12, -14, -15, -16, -18	63-17, -20	63-20
94% IPA FI 75% IPA T	none; not registered in 1986	n/a	n/a	n/a

a. n/a = not applicable

* Data pertaining to this guideline are not required for unregistered TGAIs.

The current status of the product chemistry data requirements for Monsanto glyphosate products is presented in the attached data summary tables. Please refer to these tables for a listing of the outstanding product chemistry data requirements. In addition, three MRIDs which have not yet been reviewed, but which may contain data pertinent to the reregistration of Monsanto glyphosate technical products and MPs, are included in the Product Chemistry Citations.

CONCLUSIONS

All pertinent data requirements are satisfied for the unregistered IPA acid technical and the 62% IPA FI. Provided that the registrant submits the data required in the attached data summary tables for the unregistered trisodium salt technical, the 94% IPA FI, and the 75% IPA FI, and either certifies that the suppliers of beginning materials and the manufacturing process for the glyphosate technical products and MPs have not changed since the last comprehensive product chemistry review or submits a complete updated product chemistry data package, CBRS has no objections to the reregistration of glyphosate with respect to product chemistry data requirements.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No(s): 1686 and 1687
Subject: PP#6F3380/6H5502. Glyphosate (Roundup®) in or on Soybeans.
Amendment of 9/18/86.
From: W. Chin
To: R. Taylor and Toxicology Branch
Dated: 7/6/87
MRID(s): 00161333

CBRS No(s): 2346 and 2347
Subject: PP#6F3380/FAP#6H5502. Glyphosate in/on Soybeans
Glyphosate Registration Standard. Product chemistry for
isopropylamine and sodium sesqui salts; nitrosamines.
From: J. Stokes
To: R. Taylor and Toxicology Branch
Dated: 9/1/87
MRID(s): 40155801, 41055802, 40155803

CBRS No(s): 3007
Subject: PP#6E3424: Re-evaluation of nitrosamine contaminants in glyphosate
products.
From: W. Chin
To: H. Jamerson and Toxicology Branch
Dated: 2/25/88
MRID(s): 40405401

CBRS No(s): 7742
Subject: Isopropylamine (IPA) Glyphosate. Product Chemistry Data (Storage
Stability and Vapor Pressure) for Monsanto Products.
From: K. Dockter
To: E. Feris
Dated: 5/31/91
MRID(s): 41096101

PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements. Three additional MRIDs which have not yet been reviewed, but which may contain data pertinent to the reregistration of Monsanto glyphosate MPs, are included in bold type at the end of this section.

References (cited):

00051977 Monsanto Company (1976) The Name, Chemical Identity, Physical Composition of the Pesticide: [Roundup]. Rev. (Unpublished study received Jun 3, 1976 under 524-308; CDL:096177-A)

00065754 Monsanto Company (1977) Roundup® Herbicide Analyses. (Unpublished study, including letter dated Mar 23, 1977 from L.H. Hannah to Robert J. Taylor, received May 12, 1977 under 524-308; CDL:229787-F)

00072227 Monsanto Agricultural Products Company (1978) Test for % Glyphosate. Method no. AQC-163-78 dated Oct 25, 1978. (Unpublished study received Apr 25, 1979 under 524-330; CDL:238240-E)

00076490 Monsanto Company (19??) Analytical Method--H₂SO₄/H₃PO₄ in Roundup Technical. (Unpublished study received Nov 9, 1973 under 524-308; CDL:120640-A)

00084121 Monsanto Company (1972) The Name, Chemical Identity, Physical Composition of the Pesticide Chemical: [Roundup]. (Unpublished study received on unknown date under 4G1444; CDL:098324-B)

00108160 Monsanto Co. (1978) Environmental Chemistry--Glyphosate: Summary of Data in EPA Files as of 1/9/78. (Unpublished study received Jan 16, 1978 under 524-308; CDL:096758-A)

00108202 Monsanto Co. (1978) The Name, Chemical Identity, Physical Composition of the Pesticide: [Glyphosate]. (Compilation; unpublished study received Jul 11, 1978 under 524-308; CDL:234319-A)

00161333 **Hammon, J.** (1986) Product Chemistry Data To Support the Continued Registration of Glyphosphate (N-phosphonomethyl-glycine): Report No. MSL-5066 (Revised): Project No. 7663. Unpublished study prepared by Monsanto Co. 172 p.

40154801 **Barclay, J.** (1986) Product Chemistry To Support the Registration of Sodium Sesqui-N-phosphonomethyl Glycinate: Product Identity and Composition: Laboratory Project No. MSL-6265. Unpublished study prepared by Monsanto Co. 41 p.

40154802 Barclay, J. (1986) Product Chemistry To Support the Registration of Sodium Sesqui-N-phosphonomethyl Glycinate: Analysis and Certification of Product Ingredients: Lab. Project No. MSL-6266. Unpublished study prepared by Monsanto Co. 48 p.

40155801 Barclay, J. (1986) Product Chemistry To Support the Registration of the Isopropylamine Salt of N-phosphonomethylglycine (62% Solution): Product Identity and Composition: Laboratory Project No. MSL-6196. Unpublished study prepared by Monsanto Co. 37 p.

40155802 Barclay, J. (1986) Product Chemistry To Support the Registration of the Isopropylamine Salt of N-phosphonomethylglycine (62% Solution). Analysis and Certification of Product Ingredients: Laboratory Project No. MSL-6197. Unpublished study prepared by Monsanto Co. 61 p.

40155803 Barclay, J. (1986) Product Chemistry To Support the Registration of the Isopropylamine Salt of N-phosphonomethylglycine (62% Solution). Physical and Chemical Characteristics: Laboratory Project No. MSL-6198. Unpublished study prepared by Monsanto Co. 16 p.

40405401 Hirsch, R.; Augustin, D. (1987) Nitrosamine Analyses of Roundup Herbicide, Rodeo Herbicide, MON 0139 and Polado Technical: Laboratory Project ID R. D. No. 835. Unpublished study prepared by Monsanto Agricultural Company. 212 p.

41096101 Leiber, M. (1988) Vapor Pressure Determinations for Glyphosate and MON-7200/15100: Project No. MSL-7642; R.D. No. 924. Unpublished study prepared by Monsanto Agricultural Co. 59 p.

References (not yet reviewed):

Data contained in the following MRID pertain to the trisodium salt TGAI, and may fulfill the remaining data requirements for this product. These data will be considered prior to issuance of the RED.

40154803 Barclay, J. (1986) Product Chemistry to Support the Registration of Sodium Sesqui-N-phosphonomethyl Glycinate: Physical and Chemical Characteristics: Lab. Proj. No. MSL-6267. Unpublished study prepared by Monsanto Co. 14 p.

Data contained in the following MRIDs pertain to the 62% IPA FI (EPA Reg. No. 524-333). These data will be considered prior to issuance of the RED.

41228401 Beasley, R.; Brockman, T.; Rogers, P. (1989) Product Chemistry to Support the Registration of the Isopropylamine Salt of N-Phosphonomethylglycine (62 percent

Solution): R. D. No. 954. Unpublished study prepared by Monsanto Agricultural Co. 50 p.

41228402 Beasley, R.; Brockman, T.; Rogers, P. (1989) Product Chemistry to Support the Registration of Isopropylamine Salt of (N-Phosphonomethylglycine) (62 percent Solution): R. D. No. 954. Unpublished study prepared by Monsanto Agricultural Co. 45 p.

Case No. 0178
Chemical No. 103601

Case Name: Glyphosate
Registrant: Monsanto
Product(s): IPA acid TGAI (unregistered)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? ^a	MRID Number ^b
61-1	Product Identity and Disclosure of Ingredients	N/A ^c	00161333, 40155801 ^d
61-2	Starting Materials and Manufacturing Process	Y	00051977, 00084121, 00108202, 00161333, 40155801 ^d
61-3	Discussion of Formation of Impurities	Y	00084121, 00161333, 40155801 ^d
62-1	Preliminary Analysis	Y	00161333, 40155802 ^d
62-2	Certification of Ingredient Limits	N/A ^c	00161333, 41055802 ^d
62-3	Analytical Methods to Verify the Certified Limits	N/A ^c	00065754, 00072227, 00076490, 00084121, 00108202, PP#6F1758, 00161333, 40155802 ^d
63-2	Color	Y	00051977, 00161333 ^e
63-3	Physical State	Y	00051977, 00161333 ^e
63-4	Odor	Y	00161333 ^e
63-5	Melting Point	Y	00051977, 00161333 ^e
63-6	Boiling Point	N/A	00161333 ^e
63-7	Density, Bulk Density or Specific Gravity	Y	00051977, 00161333 ^e
63-8	Solubility	Y	00051977, 00161333 ^e
63-9	Vapor Pressure	Y	00161333 ^e , 41096101 ^f
63-10	Dissociation Constant	Y	00108160, 00161333 ^e
63-11	Octanol/Water Partition Coefficient	Y	00161333 ^e
63-12	pH	Y	00161333 ^e
63-13	Stability	Y	00161333 ^e

^a Y = Yes; N = No; N/A = Not Applicable.

^b References were reviewed in the Product Chemistry Science Chapter of the Registration Standard dated 7/15/85 unless otherwise noted.

^c Data concerning this guideline are not required for the TGAI.

^d CBRS Nos. 2346 and 2347, 9/1/87, J. Stokes.

^e CBRS Nos. 1686 and 1687, 7/6/87, W. Chin.

^f CBRS No. 7742, 5/31/91, K. Dockter.

Case No. 0178
 Chemical No. 103603

Case Name: Glyphosate
 Registrant: Monsanto
 Product(s): Trisodium salt TGAI (unregistered)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? ^a	MRID Number ^b
61-1	Product Identity and Disclosure of Ingredients	N/A ^c	40154801 ^d
61-2	Starting Materials and Manufacturing Process	Y	40154801 ^d
61-3	Discussion of Formation of Impurities	Y	40154801 ^d
62-1	Preliminary Analysis	Y	40154802 ^d
62-2	Certification of Ingredient Limits	N/A ^c	41054802 ^d
62-3	Analytical Methods to Verify the Certified Limits	N/A ^c	00065754, 00072227, 00076490, 00084121, 00108202, PP#6F1758, 40154802 ^d
63-2	Color	Y	PP#8E2122
63-3	Physical State	Y	PP#8E2122
63-4	Odor	N	
63-5	Melting Point	Y	PP#8E2122
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	Y	PP#8E2122
63-8	Solubility	N	
63-9	Vapor Pressure	N	
63-10	Dissociation Constant	Y	PP#8E2122
63-11	Octanol/Water Partition Coefficient	N	
63-12	pH	N	
63-13	Stability	N	

^a Y = Yes; N = No; N/A = Not Applicable.

^b References were reviewed in the Product Chemistry Science Chapter of the Registration Standard dated 7/15/85 unless otherwise noted.

^c Data concerning this guideline are not required for the TGAI.

^d CBRS Nos. 2346 and 2347, 9/1/87, J. Stokes.

Case No. 0178
Chemical No. 103601

Case Name: Glyphosate
Registrant: Monsanto
Product(s): 62% IPA FI (EPA Reg. No. 524-333)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? ^a	MRID Number ^b
61-1	Product Identity and Disclosure of Ingredients	Y	40155801 ^c
61-2	Starting Materials and Manufacturing Process	Y	40155801 ^c
61-3	Discussion of Formation of Impurities	Y	40155801 ^c
62-1	Preliminary Analysis	Y	40155802 ^c , 40405401 ^d
62-2	Certification of Ingredient Limits	Y	41055802 ^c
62-3	Analytical Methods to Verify the Certified Limits	Y	00065754, 00072227, 00076490, 00084121, 00108202, PP#6F1758, 40155802 ^c
63-2	Color	Y	00161333 ^e , 40155803 ^f
63-3	Physical State	Y	00161333 ^e , 40155803 ^f
63-4	Odor	Y	00161333 ^e , 40155803 ^f
63-5	Melting Point	Y	00161333 ^e
63-6	Boiling Point	N/A	00161333 ^e
63-7	Density, Bulk Density or Specific Gravity	Y	00161333 ^e , 40155803 ^f
63-8	Solubility	Y	00161333 ^e
63-9	Vapor Pressure	Y	00161333 ^e , 41096101 ^g
63-10	Dissociation Constant	Y	00161333 ^e
63-11	Octanol/Water Partition Coefficient	Y	00161333 ^e
63-12	pH	Y	00161333 ^e , 40155803 ^f
63-13	Stability	Y	00161333 ^e

^a Y = Yes; N = No; N/A = Not Applicable.

^b References were reviewed in the Product Chemistry Science Chapter of the Registration Standard dated 7/15/85 unless otherwise noted.

^c CBRS Nos. 2346 and 2347, 9/1/87, J. Stokes.

^d CBRS No. 3007, 2/25/88, W. Chin

^e CBRS Nos. 1686 and 1687, 7/6/87, W. Chin.

^f Glyphosate Reregistration Standard Update, dated 4/26/90.

^g CBRS No. 7742, 5/31/91, K. Dockter.

Case No. 0178
 Chemical No. 103601

Case Name: Glyphosate
 Registrant: Monsanto
 Product(s): 94% IPA FI (EPA Reg. No. 524-421)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? ^a	MRID Number
61-1	Product Identity and Disclosure of Ingredients	N	
61-2	Starting Materials and Manufacturing Process	N	
61-3	Discussion of Formation of Impurities	N	
62-1	Preliminary Analysis	N	
62-2	Certification of Ingredient Limits	N	
62-3	Analytical Methods to Verify the Certified Limits	N	
63-2	Color	N	
63-3	Physical State	N	
63-4	Odor	N	
63-5	Melting Point	N	
63-6	Boiling Point	N	
63-7	Density, Bulk Density or Specific Gravity	N	
63-8	Solubility	N	
63-9	Vapor Pressure	N	
63-10	Dissociation Constant	N	
63-11	Octanol/Water Partition Coefficient	N	
63-12	pH	N	
63-13	Stability	N	

^a Y = Yes; N = No; N/A = Not Applicable.

Case No. 0178
 Chemical No. 103601

Case Name: Glyphosate
 Registrant: Monsanto
 Product(s): 75% IPA T (EPA Reg. No. 524-421)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? ^a	MRID Number
61-1	Product Identity and Disclosure of Ingredients	N	
61-2	Starting Materials and Manufacturing Process	N	
61-3	Discussion of Formation of Impurities	N	
62-1	Preliminary Analysis	N	
62-2	Certification of Ingredient Limits	N	
62-3	Analytical Methods to Verify the Certified Limits	N	
63-2	Color	N	
63-3	Physical State	N	
63-4	Odor	N	
63-5	Melting Point	N	
63-6	Boiling Point	N	
63-7	Density, Bulk Density or Specific Gravity	N	
63-8	Solubility	N	
63-9	Vapor Pressure	N	
63-10	Dissociation Constant	N	
63-11	Octanol/Water Partition Coefficient	N	
63-12	pH	N	
63-13	Stability	N	

^a Y = Yes; N = No; N/A = Not Applicable.

DYNAMAC
CORPORATION
Environmental Services

Final Report

GLYPHOSATE
Shaughnessy Nos. 103601 & 103603
Case 0178

TASK 2B: RED
RESIDUE CHEMISTRY

October 16, 1992

Contract No. 68-D2-0053

Submitted to:
U.S. Environmental Protection Agency
Arlington, VA 22302

Submitted by:
Dynamac Corporation
The Dynamac Building
2275 Research Boulevard
Rockville, MD 20850-3268

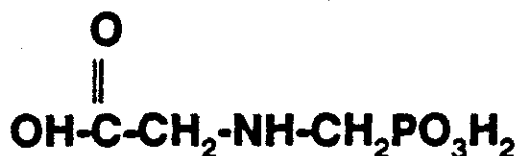
GLYPHOSATEREREGISTRATION ELIGIBILITY DOCUMENTRESIDUE CHEMISTRY CONSIDERATIONS(Shaughnessy Nos. 103601 & 103603; Case 0178)TASK 2BINTRODUCTION

Glyphosate (N-phosphonomethyl glycine) is a nonselective herbicide and plant growth regulator that includes isopropylamine salt (Chemical Code 103601) and the sodium salt (Chemical Code 103603). It is registered for use on a variety of food and feed crops; refer to Table A for a comprehensive list. Glyphosate is typically applied on these crops as postemergence spray to foliage of the vegetation controlled before planting, and after planting but prior to crop emergence, or as directed spray in established crops. In addition, glyphosate may be used in and around aquatic sites; treated water from aquatic sites may be used to irrigate crops (*Source: LUIS General Chemical Draft Report for Glyphosate, 7/20/92*).

The Reregistration Standard Guidance Document for glyphosate was issued 6/86. The Glyphosate Product and Residue Chemistry Reregistration Standard Update was completed 4/26/90. The information contained in this document outlines the Residue Chemistry Science Assessments with respect to the reregistration of glyphosate.

Tolerances for residues of glyphosate in or on food/feed and in processed commodities are currently expressed in terms of the combined residues of glyphosate and its metabolite aminomethylphosphonic acid (AMPA), expressed as glyphosate [*Source: 40 CFR §180.364 (a)(b)(c), 185.3500, and 186.3500*]. The tolerances listed in 40 CFR §180.364(a) are for the combined residues resulting from application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate. The majority of these tolerances are set at 0.2 ppm. The tolerances listed in 40 CFR §180.364(b) are for the combined residues resulting from application of the glyphosate isopropylamine salt and/or glyphosate monoammonium salt for herbicidal and plant growth regulator purposes and/or the sodium sesqui salt for plant regulator purposes. The tolerances listed in 40 CFR §180.364(c) are for the combined residues resulting from the use of irrigation water containing residues of 0.5 ppm following applications on or around aquatic sites. Adequate enforcement methods are available for the residue determination of these regulated compounds in or on plant and animal commodities, and in water. The HED Metabolism Committee has determined that aminomethylphosphonic acid (AMPA), the metabolite of glyphosate, no longer needs to be regulated and therefore this compound will be dropped from the tolerance regulation.

The structure of glyphosate is given below;



SUMMARY OF SCIENCE FINDINGS

§171-4 (a): Plant Metabolism: The qualitative nature of the residue in plants is adequately understood. Studies with a variety of plants including corn, cotton, soybeans, and wheat indicate that the uptake of glyphosate or its metabolite AMPA from soil is limited, but the residues which are taken up are readily translocated. Foliarly applied glyphosate is readily absorbed and translocated throughout apples, coffee, dwarf citrus (calamondin), grapes, and pears. Metabolism occurs via N-methylation and ultimately yields N-methylated glycines and phosphonic acids. For the most part, the ratio of glyphosate to AMPA is 9 to 1 but can approach 1 to 1 in a few cases (e.g., soybeans and carrots). Much of the residue data for crops reflects a detectable residue of parent (0.05-0.15 ppm) along with a nondetectable residue (<0.05 ppm) of AMPA. The terminal residue to be regulated in plants is glyphosate per se.

§171-4 (b): Animal Metabolism: The qualitative nature of the residue in animals is adequately understood. Studies involving lactating goats and laying hens fed a mixture of glyphosate and AMPA indicate that the primary route of elimination was by excretion (urine and feces) and that the results are consistent with the metabolism studies in rats, rabbits, and cows. The terminal residues in eggs, milk, and animal tissues are glyphosate and its metabolite AMPA; there was no evidence of further metabolism. The terminal residue to be regulated in livestock is glyphosate per se.

§171-4 (c) and (d): Residue Analytical Methods - Plants and Animals: Adequate enforcement methods are available for analysis of residues of glyphosate and its metabolite AMPA in or on plant commodities and in water. These methods include GLC (Method I of PAM Vol. II; limit of detection is 0.05 ppm) and HPLC with fluorometric detection. Use of the GLC method, however, is being discouraged due to lengthiness of the procedure. The HPLC method has undergone successful Agency validation (method tryout) and was recommended for inclusion in PAM Vol. II; the limit of detection is 0.0005 ppm. For enforcement of tolerances in animal commodities, an HPLC method with fluorescence detector is available; the reported limits of detection are 0.01 ppm for glyphosate and 0.012 ppm for AMPA.

§171-4 (e): Storage Stability: The available storage stability data indicate that residues of glyphosate and its metabolite AMPA are stable under frozen (-20 C) storage conditions: in or on plant commodities for a period of 1 year, in animal commodities for 2 years, and in water for 1 year. No additional storage stability data are needed.

§171-4 (f-l): Magnitude of the Residue in Plants, Animals, Potable Water, and Fish:

The conclusions regarding the reregistration eligibility of glyphosate on the crops listed in Table A are based on the use patterns registered by the basic producer, Monsanto Agricultural Chemical Company as reflected in the LUIS report for glyphosate, 7/20/92. When end-use product DCIs are developed (e.g. at issuance of the RED), RD should require that all end-use product labels (e.g. MAI labels, SLNs, and products subject to the generic data exemption) be amended such that they are consistent with the basic producer labels.

All data requirements for magnitude of the residue in plants have been evaluated and deemed adequate. *[Note: The registrant has also committed to providing new potato and sorghum processing studies.]* All data requirements for magnitude of the residue in plants as a result of irrigation with glyphosate-treated water have also been submitted and are adequate to support registered use and applicable tolerances. No additional data are required for magnitude of the residue in animals, potable water, and fish.

TABLE A. RESIDUE CHEMISTRY SCIENCE ASSESSMENTS FOR REREGISTRATION OF GLYPHOSATE.

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
§171-4 (a): Plant Metabolism	N/A	No	00038771, 00039141, 00051983, 00065753, 00108097, 00108129, 00108133, 00108140, 00108151, 00111945, PP4G14444, PP5F1560, PP7F2016, GS0178-003
§171-4 (b): Animal Metabolism	N/A	No	00094971, 00108098, 00108099, 00108100, 00108101, 00108116, 00108099, 00108200, PP4G1444, PP9F2163, GS0178-004, 40541301- 40541302 ²

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
§171-4 (c) and (d): Residue Analytical Methods	N/A	No	00028853, 00036222, 00036223, 00036231, 00037688, 00038770, 00038979, 00044423, 00051982, 00053002, 00053005, 00060108, 00061559, 00063714, 00065751, 00065752, 00067425, 00076805, 00078823, 00078824, 00108133, 00108144, 00108149, 00108151, 00108175, 00108176, 00108186, 00108231, 00111945, 00111949, 00122715, 00159419, PP4G1444, PP5F1536, PP6G1679, PPOF2329, PP9F2163, PPIF2455, GS0179-017, GS0178-019, GS0178-020, GS0178-021, GS0178-022, GS0178-23, GS1278-014, 00164729, ³ 40502601, ⁴ 40541304 ²
§171-4 (e): Storage Stability	N/A	No	00039142, 00040083, 00051980, 00053002, 00061553, 00061555, 00108129, 00108132, 40502605, ^{2,4} 40532004, ^{2,4} 41940701 ⁵
§171-4 (k) (l): Magnitude of the Residue in Plants			
<u>Root and Tuber Vegetables Group</u>			
- Artichokes, Jerusalem	0.2 [§180.364(a)]	No	N/A ⁶
- Beets, garden	0.2 [§180.364(a)]	No	00108159
- Carrots	0.2 [§180.364(a)]	No	PP7F2016, 00108159
- Chicory	0.2 [§180.364(a)]	No	N/A
- Horseradish	0.2 [§180.364(a)]	No	N/A
- Parsnips	0.2 [§180.364(a)]	No	N/A
- Potatoes	0.2 [§180.364(a)]	No	00108151, 41947001 ⁷

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
(processed commodities)		No ⁸	40785302
- Radish	0.2 [§180.364(a)]	No	00108159
- Rutabagas	0.2 [§180.364(a)]	No	N/A
- Salsify	0.2 [§180.364(a)]	No ⁹	N/A
- Sugar beets	0.2 [§180.364(a)]	No	00039381, 00108151
(processed commodities)		No	40785304
- Sweet potato	0.2 [§180.364(a)]	No	00108151
- Turnips	0.2 [§180.364(a)]	No	40835201 ¹⁰
<u>Leaves of Root and Tuber Vegetables Group</u>	0.2 [§180.364(a)] ¹¹		
- Beets, greens		No	N/A
- Chicory leaves		No	N/A
- Sugar beet tops		No	00039381, 00108151
- Turnip tops		No	40835201 ¹⁰
<u>Bulb Vegetables Group</u>	0.2 [§180.364(a)]		
- Garlic		No	N/A
- Onions (green and dry bulb)		No	40783101 ¹²
<u>Leafy Vegetables (except Brassica) Group</u>	0.2 [§180.364(a)]		
- Celery		No	N/A
- Lettuce (head and leaf)		No	00108159, PP7F2016
- Spinach		No	N/A
<u>Brassica Leafy-Vegetables Group</u>	0.2 [§180.364(a)]		
- Broccoli		No	40802801, 40802801 ¹³
- Cabbage		No	00108159, PP7F2016
- Cauliflower		No	N/A
- Kale		No	N/A
- Mustard greens		No	40802801, 40802801 ¹³

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
<u>Legume Vegetables</u> <u>(Succulent/Dried) Group</u>	0.2 [§180.364(a)] ¹⁴		
- Beans (succulent and dried)		No	00108159, PP7F2016
- Lentils		No	00108159
- Peas (succulent and dried)		No	00108159, PP7F2016
- Soybeans (processed commodities)	20 [§180.364(a)] ¹⁵ 100 (hulls) [§186.3500] ¹⁶	No No	00015759, 00015760, 00015761, 00015762, 00015763, 00015764, 00015765, 00015766, 00015767, 00024503, 00033954, 00038908, 00040084, 00061555, 00108153, 00108203, PP7F1971 00061555, 00108153, 00156793 ¹⁷
<u>Foliage of Legume Vegetables</u> <u>(Succulent/Dried) Group</u>	0.2 [§180.364(a)] ¹⁸		
- Bean vines and hay		No	00108159, PP7F2016
- Lentil forage and hay		No	00108159
- Pea vines and straw		No	PP7F2016
- Soybean forage and hay	15 [§180.364(a)] ¹⁹	No	00015759, 00015760, 00015761, 00015762, 00015763, 00015764, 00015765, 00015766, 00015767, 00033954, 00038908, 00040084, 00061555, 00108153, 00108203, PP7F1971
<u>Fruiting Vegetables Group</u>	0.1 [§180.364(a)]	No	PP3E2893
<u>Cucurbit Vegetables Group</u>	0.5 [§180.364(a)]	No	PP3E2845
<u>Citrus Fruits Group</u>	0.2 [§180.364(a)]	No	00039142

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
(processed commodities)	1.0 (dried pulp) 1.0 (molasses) [§186.3500] ⁵	No	PP8H5568 ²⁰ , 40159401 ²¹
<u>Pome Fruits Group</u>	0.2 [§180.364(a)]	No	00108129
<u>Stone Fruits Group</u>	0.2 [§180.364(a)]	No	00111949
- Plums (fresh prunes)		No	00111949
(processed commodities)		No	40785301
<u>Small Fruits and Berries Group</u>	0.2 [§180.364(a)] ²²		
- Blackberries		No	PP3E2930
- Blueberries		No	PP3E2930
- Cranberries		No	00053002
- Grapes		No	00038770, 00108132
(processed commodities)		No	40785303
- Raspberries		No	PP3E2930
<u>Tree Nuts Group</u>	0.2 [§180.364(a)]	No	00111945
- Almond hulls	1 [§180.364(a)]	No	00111945
<u>Cereal Grains Group</u>	0.1 [§180.364(a)]		
- Barley		No	00038908, 00040087, 00044422, 00108203
(processed commodities)		No	N/A
- Corn (field and fresh)		No	00023336, 00023512, 00037687, 00038908, 00040085, 00048284, 00108203, 40502602 ^{24,17}
(processed commodities)		No	40502604, ⁴ 41478101 ²³
- Oats		No	00038908, 00040087, 00044422, 00108203
(processed commodities)		No	N/A
- Rice		No	00038908, 00040087, 00044422
(processed commodities)		No ²⁴	N/A

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
- Rye (processed commodities)		No	N/A
- Sorghum (processed commodities)		No ⁸	00038908, 00040087, 00044422, 00108203, 00109271, 40502601 ²⁵
- Wheat (processed commodities)		No ²⁷	00038908, 00040086, 00044426, 00108203, 00122715, 41484301 ^{28,29}
<u>Forage, Fodder, and Straw of Cereal Grains Group</u>	0.2 [§180.364(a)] ³²	No ³⁰	00150835 ^{28,29,31}
- Barley forage, hay, and straw		No	00038908, 00040087, 00044422, 00108203
- Corn forage and fodder		No	00023336, 00023512, 00037687, 00038908, 00040085, 00048284, 00108203, 40502602
- Oat forage, hay, and straw		No	00038908, 00040087, 00044422, 00108203
- Rice straw		No	00038908, 00040087, 00044422
- Rye forage and straw		No	N/A
- Sorghum forage and fodder		No	00038908, 00040087, 00044422, 00108203, 00109271, 40502601 ²⁵
- Wheat forage and straw		No ³³	00038908, 00040086, 00044426, 00108203, 00122715, PPOF3865/FAP2H5635 ²⁹
<u>Grass Forage, Fodder, and Hay Group</u>	0.2, ³⁴ 200 ³⁵ [§180.364(a)]	No	00076805, 00108147
<u>Non-grass Animal Feeds (forage, fodder, straw, and hay) Group</u>	0.2, ³⁶ 0.4, ³⁷ 200 ³⁸ [§180.364(a)]	No	00076805, 00108147
- Alfalfa seed		No	40541304

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
<u>Miscellaneous Commodities</u>			
- Acerola	0.2 [§180.364(a)]	No	PP3E2929
- Atemoya	0.2 [§180.364(a)]	No	PP6E3424 ³⁹
- Asparagus	0.5 [§180.364(a)]	No	00108144, 40642401 ⁴⁰
- Avocados	0.2 [§180.364(a)]	No	00108149
- Bananas	0.2 [§180.364(a)]	No	00108175
- Breadfruit	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Canistel	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Carambola	0.2 [§180.364(a)]	No	PP6E3424 ³⁹
- Cherimoya	0.2 [§180.364(a)]	No ⁹	PP0E3881 ⁴²
- Cocoa beans	0.2 [§180.364(a)]	No ⁹	PP0E3857 ⁴³
- Coconut	0.1 [§180.364(a)]	No ⁹	
- Coffee beans	1 [§180.364(a)]	No	00051980, 00051981 ⁴⁴
- Cotton	15 (cottonseed, forage, & hay) [§180.364(a)]	No	00060103, 00061553, 00108176, 00108153, 00108203, PP7F1971
(processed commodities)		No	00061553, 00108176, 00108153
- Dates	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Figs	0.2 [§180.364(a)]	No	PP3E2929
- Genip	0.2 [§180.364(a)]	No ⁹	PP0E3873 ⁴⁵
- Guavas	0.2 [§180.364(a)]	No	00059050, PP1E2443
- Jaboticaba	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Jackfruit	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Kiwi fruit	0.2 [§180.364(a)]	No	PP3E2929
- Litchi Nut (Lychee)	0.2 [§180.364(a)]	No	PP9E3715 ^{46,47}
- Longan	0.2 [§180.364(a)]	No	PP9E3715 ^{46,47}
- Mamey Sapote (Mam mee Apple)	0.2 [§180.364(a)]	No	PP9E3715 ^{46,47}
- Mangoes	0.2 [§180.364(a)]	No	40580401
- Okra	0.2 [§180.364(a)]	No	N/A
- Olives	0.2 [§180.364(a)]	No	00108175, PP9F2223, FAP0H5255, 42398401 ⁴⁸

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
(processed commodities)	0.1 (imported olives) [§185.3500]	No	00108175, PP9F2223, FAPOH5255, 42398401 ⁴⁸
- Palm oil	0.1 [§185.3500]	No	FAP6H5144
- Papayas	0.2 [§180.364(a)]	No	00063713
- Passion Fruit	0.2 [§180.364(a)]	No	PP9E3715 ^{46,47}
- Peanuts	0.1 (peanuts) [§180.364(c)]; 0.5 (forage, hay, & hulls) [§180.364(a)(c)];	No	00144341, 00028852, 40750702
(processed commodities)		No	00144341 ⁴⁹ , 00028852
- Persimmons	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Pineapple	0.1 [§180.364(a)]	No ⁵⁰	N/A
- Pistachio	0.2 [§180.364(a)]	No	00111945
- Sapodilla	0.2 [§180.364(a)]	No	PP9E3715 ^{46,47}
- Sapote (black and white)	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Soursop	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Sugar apple	0.2 [§180.364(a)]	No	PP6E3424 ³⁹
- Sugarcane	2.0 [§180.364(b)]	No ⁵¹	00108140, PP8E2122, PP9H5196, PP8F2122
(processed commodities)	30.0 (molasses) [§185.3500]	No	00108168 ¹⁷
- Tamarind	0.2 [§180.364(a)]	No ⁹	40149401 ⁴¹
- Tea	1.0 (dried tea), 7.0 (instant tea) ⁵² [§185.3500]	No	00078823, 00078824, PP8H5568 ²⁰
- Watercress	0.2 [§180.364(a)] ⁵²	No	N/A
§171-4 (h): Magnitude of the Residue in Plants Resulting from the Use of Irrigation Water	0.1 [§180.364(a)] ⁵³	No	00039381, 40541305
§171-4 (j): Magnitude of the Residue in Meat, Milk, Poultry, and Eggs	0.5 ⁵⁴	No	00108115, PP5F1536, 40532001-03 ²

TABLE A. (Continued).

Data Requirements	Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References ¹
§171-4 (g): Magnitude of the Residue in Fish	0.25 (fish) 3 (shellfish) [§180.364(b)]	No	00036229, 00076491, PP6G1679, PP6H5106, 00154311, 00155120 ⁵⁵
§171-4 (f): Nature and Magnitude the Residue in Drinking and Irrigation Water	0.7 ⁵⁶	No	00039377, 00039381, 00077227, 00077228, 00077229, 00077230, 00077231, 00077232, 00077233, 00077234, 00077235, 00077236, 00077237, 00077238, 00077301, 00108173, PP9F2163, PP6G1679/FAP6H5106, PP9F2163/FAP9H5024
§171-4 (i): Magnitude of the Residue in Food Handling Establishment		Not Required	
§171-5: Reduction of Residues		Not Required	

1. **Bolded** references were reviewed in the Update of 4/26/90. Unbolded references were reviewed in the Residue Chemistry Science Chapter of the Reregistration Standard dated 7/15/85. Otherwise, reviewed as noted.

2. CBTS Nos. 4285 & 4286, 1/30/89. W. Chin.

3. CBRS Nos. 2731, 2733, & 2734, 9/25/87. F. Griffith.

4. CBTS No. 4289, 2/1/89. M. Flood.

5. CBRS No. **8337**, 4/2/92. R. Perfetti.

6. N/A = **Not available** because data from other crop group members were used to satisfy data requirements via translation.

7. CBRS No. 8367, 10/21/91, M. Metzger.

8. The available data were generated by Craven Laboratories; the registrant has committed to providing a new study (CBRS No. 10124, 8/26/92, R. Perfetti).

TABLE A. (Continued).

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9. Not currently registered.
 10. CBTS No. 4503, 2/10/89, M. Nelson.
 11. A crop group tolerance of 0.2 ppm (negligible residue) has been established for the combined residues of glyphosate and its metabolite AMPA in or on "leafy vegetables", which is now considered to be an obsolete crop group classification (40 CFR §180.34).
 12. CBTS No. 4284, 10/20/88, M. Nelson.
 13. CBTS No. 4361, 12/9/88, F. Toghrol.
 14. A crop group tolerance of 0.2 ppm (negligible residue) has been established for the combined residues of glyphosate and its metabolite AMPA in or on "seed and pod vegetables", which is now considered an obsolete crop group classification (40 CFR §180.34). In addition, an individual tolerance of 20 ppm has been established for the combined residues of glyphosate and its AMPA metabolite in or on soybeans (FR 42701, 9/16/92).
 15. FR 42701, 9/16/92.
 16. FR 42701, 9/16/92.
 17. CBRS Nos. 8196 & 8220, 2/3/92, R. Perfetti.
 18. A crop group tolerance of 0.2 ppm (negligible residue) has been established for the combined residues of glyphosate and its metabolite AMPA in or on the "forage and hay of seed and pod vegetables", which is now considered an obsolete crop group classification (40 CFR §180.34). In addition, individual tolerances of 15 ppm have been established for the combined residues of glyphosate and its metabolite AMPA in or on soybean forage and hay.
 19. In addition, a tolerance of 200 ppm has been established for the combined residues of glyphosate and AMPA in or on soybean straw (FR 42701, 9/16/92). This tolerance should be deleted and the soybeans, hay tolerance level raised to 200 ppm to cover this dessicant use.
 20. CBTS No. 4685, 3/22/89, M. Nelson.
 21. CBTS Nos. 2369-2371, 7/20/87, M. Nelson.
 22. A crop group tolerance of 0.2 ppm has been established for the combined residues of glyphosate and its metabolite AMPA in or on small fruits and berries. In addition, individual tolerances of 0.2 ppm have been established for the combined residues of glyphosate and its AMPA metabolite in or on grapes and cranberries.
 23. CBTS Nos. 6745 & 6746, 7/13/90, F. Griffith.
 24. Data requirements for rice processed commodities were waived (Residue Chemistry Science Chapter of the Reregistration Standard).
 25. CBTS Nos. 4357 & 4358, 11/18/88, S. Willet.
 26. CBTS Nos. 6740-6742, 9/5/90, S. Willet.

TABLE A. (Continued).

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27. CBTS recommends for the establishment of a 4 ppm tolerance for combined residues of glyphosate and its metabolite AMPA in or on wheat grain (CBTS Nos. 9686-9690, 5/26/92, R. Cook).
 28. CBTS Nos. 6748-6750, 1/29/91, R. Cook.
 29. CBTS Nos. 9686-9690, 5/29/92, R. Cook.
 30. CBTS recommends for the establishment of Monsanto's proposed 12-ppm FAT for combined residues of glyphosate and its metabolite AMPA in wheat milling fractions (except flour) (CBTS Nos. 9686-9690, 5/26/92, R. Cook).
 31. CBTS Nos. 537 & 538, 4/18/85, R. Cook.
 32. A crop group tolerance of 0.2 ppm has been established for the combined residues of glyphosate and its metabolite AMPA in or on "forage grasses", which is now considered an obsolete crop group classification (40 CFR §180.34).
 33. CBTS recommends for the establishment of an 85-ppm tolerance for combined residues of glyphosate and its metabolite AMPA in or on wheat straw (CBTS Nos. 9686-9690, 5/26/92, R. Cook).
 34. Tolerances have been established for the combined residues of glyphosate and its metabolite AMPA in or on forage grasses at 0.2 ppm; and on grasses, forage, at 0.2 ppm.
 35. Tolerances have been established for the combined residues of glyphosate and its metabolite AMPA in or on individual grasses (bahiagrass, bluegrass, bromegrass, fescue, orchardgrass, ryegrass, timothy, and wheatgrass) at 200 ppm.
 36. Tolerances have been established for the combined residues of glyphosate and its metabolite AMPA in or on alfalfa fresh and hay at 0.2 ppm.
 37. A crop group tolerance of 0.4 ppm has been established for the combined residues of glyphosate and its metabolite AMPA in or on "forage legumes (except soybeans and peanuts)", which is now considered an obsolete crop group classification (40 CFR §180.34).
 38. Individual tolerances of 200 ppm have been established for the combined residues of glyphosate and its metabolite AMPA in or on alfalfa and clover.
 39. CBTS No. 1528, 9/30/86, M. Firestone.
 40. CBTS No. 3967, 9/8/88, R. Cook.
 41. CBTS No. 5196, 9/19/89, W. Chin.
 42. CBTS No. 6938, 9/5/90 and CBTS No. 7275, 11/10/90.
 43. CBTS No. 6827, 7/24/90 and CBTS No. 7915, 4/23/91.
 44. CBRS No. 9674, 7/9/92, D. McNeilly.

TABLE A. (Continued).

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45. CBTS No. 6828, 7/20/90 and CBTS No. 6935, 9/5/90.
 46. CBTS No. 4907, 4/5/89, M. Nelson.
 47. CBTS No. 5327, 6/8/89, M. Nelson.
 48. CBRS No. 10256, 10/8/92, R. Perfetti.
 49. CBRS No. 10124, 8/26/92, R. Perfetti.
 50. Data requirements for pineapples were waived (Residue Chemistry Science Chapter of the Reregistration Standard) based on the built-in 21-month preharvest interval.
 51. Data for sugarcane are no longer required (CBRS Nos. 8196 & 8220, 2/3/92, R. Perfetti). Data for sugarcane forage are no longer required as the registrant has imposed a feeding restriction (CBRS Nos. 2372-2374, 9/25/87, F. Griffith).
 52. A tolerance of 0.2 ppm (negligible residues) has been established for the combined residues of glyphosate and its metabolite AMPA in or on watercress as a member of the "leafy vegetables group" which is now considered an obsolete crop group classification.
 53. Tolerances of 0.1 ppm have been established for the combined residues of glyphosate and its metabolite AMPA in or on the crop groups citrus, cucurbits, forage grasses, forage legumes, fruiting vegetables, grain crops, leafy vegetables, nuts, pome fruits, root crop vegetables, seed and pod vegetables, stone fruit, and the individual commodities cotton seed, hops, and avocados resulting from the use of irrigation water containing residues of 0.5 ppm following applications on or around aquatic sites.
 54. Tolerances of 0.5 ppm have been established for the combined residues of glyphosate and its metabolite AMPA in the liver and kidney of cattle, goats, hogs, horses, poultry, and sheep.
 55. CBRS No. 409, 4/10/86, E. Haerberer.
 56. A maximum contaminant level (MCL) of 0.7 ppm in drinking water has been established by the Office of Ground Water and Drinking Water. The maximum expected concentration of the combined residues of glyphosate and AMPA in irrigation water has been determined to be 0.5 ppm.

TOLERANCE REASSESSMENT SUMMARY

The HED Metabolism Committee has determined that aminomethylphosphonic acid (AMPA), the metabolite of glyphosate, no longer needs to be regulated and therefore this compound will be dropped from the tolerance expression.

Tolerances Listed Under 40 CFR §180.364(a):

The tolerances listed in 40 CFR §180.364(a) are for the combined residues of glyphosate and its metabolite AMPA resulting from application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate.

Sufficient data are available to ascertain the adequacy of the established tolerances listed in 40 CFR §180.364(a) for: acerola; alfalfa, forage, seed, and hay; almonds, hulls; artichokes, Jerusalem; asparagus; atemoya; avocados; Bahiagrass; bananas; beets, garden, roots; Bermudagrass; bluegrass; Brassica leafy vegetables group; bromegrass; bulb vegetables group; carambola; carrots; cereal grains group; citrus fruits group; coffee beans, green; clover; cotton forage; cotton hay; cottonseed; cranberries; cucurbit vegetables group; fescue; figs; foliage of legume vegetables group; fruiting vegetables group; grapes; grass forage, fodder, and hay group; guavas; horseradish; kiwifruit; leafy vegetables group; leaves of the root and tuber vegetables group; legume vegetables group; longan fruit; lychee; mangoes; non-grass animal feeds group, forage and hay; orchardgrass; papayas; parsnips; passion fruit; peanuts; peanuts, vines; pineapple; pistachio; pome fruits group; potatoes; radishes; rutabagas; ryegrass; sapodilla; sapote; small fruits and berries group; soybeans; soybean, forage; stone fruits group; sugar apple; sugar beets; sweet potatoes; timothy; tree nuts group; turnip roots; wheatgrass; and yams. Certain commodity definitions of the above tolerances are not in accordance with the definitions listed in Table II of Subdivision O; see Table B for modifications in commodity definitions.

The data for the present potato and sorghum processing studies were generated by Craven Laboratories, however, the registrant has committed to providing new studies.

The established crop group tolerances for the now-obsolete "seed and pod vegetables" (0.2 ppm) and "seed and pod vegetables, forage and hay" (0.2 ppm) are inappropriate and should be replaced with "legume vegetables group (except soybeans)" and "legume vegetables group, foliage of (except soybean forage and hay)", respectively. Soybeans must be excluded from the crop group tolerances because the use pattern for soybeans is different from other legume vegetables, and the established tolerance for soybeans and soybean forage and hay differ by a factor > 5x from other legume vegetables. To achieve compatibility with Codex MRLs for selected commodities, the following actions must be taken (see Table C): (i) increase U.S. tolerance for legume vegetables group (except soybeans) from 0.2 ppm to 5 ppm; and (ii) increase U.S. tolerance for soybean hay from 15 ppm to 20 ppm.

The individual tolerances for cranberries (0.2 ppm) and grapes (0.2 ppm) should be revoked since these fruits are covered by the crop group tolerance (0.2 ppm) for small fruits and berries. The tolerance for cotton hay should also be revoked since this is not a raw agricultural commodity of cotton.

Tolerances for wheat, grain and wheat, straw at 4 and 85 ppm, respectively, have been proposed (PPOF3865/FAP2H5635). When these tolerances have been established, the tolerances for the cereal grains group and the cereal grains group, forage, fodder, and straw should be modified to "cereal grains group (except wheat)" and "cereal grains group, forage, fodder, and straw (except wheat straw)", respectively. To achieve compatibility with the Codex MRL for wheat grain, the U.S. tolerance should be established at 5 ppm (see Table C).

The existing and conflicting tolerances for alfalfa (200 ppm), alfalfa fresh and hay (0.2 ppm), clover (200 ppm), and forage legumes (except soybeans and peanuts; 0.4 ppm) should be deleted. Concomitant with the deletion of these tolerances, a tolerance of 100 ppm for residues in or on the non-grass animal feeds group, forage and hay, should be established. The available data from alfalfa, lespedeza, and trefoil will support this crop group tolerance.

The established tolerances for "forage grasses" (0.2 ppm), "grasses, forage" (0.2 ppm), Bahiagrass (200 ppm), Bermudagrass (200 ppm), bluegrass (200 ppm), bromegrass (200 ppm), fescue (200 ppm), orchardgrass (200 ppm), ryegrass (200 ppm), timothy (200 ppm), and wheatgrass (200 ppm) should be deleted. Concomitant with the deletion of these tolerances, a tolerance for residues in or on the grass forage, fodder, and hay group should be established at 100 ppm. The available data indicate that following registered use, residues in or on the grass forage, fodder, and hay group will not exceed 100 ppm.

Individual tolerances exist for residues in or on salsify and the following tropical/subtropical crops: breadfruit; canistel; cherimoya; cocoa beans; coconut; dates; genip; jaboticaba; jackfruit; persimmons; sapote (black and white); soursop; and tamarind. There are currently no registered uses of glyphosate on these crop sites. Unless an interested party declares intent to include these crop sites on a product label and submit appropriate, supporting residue data, we recommend that these individual tolerances be revoked.

A tolerance of 200 ppm has recently been established for residues in or on soybean straw (FR 42701, 9/16/92). However, this tolerance should be revoked since this is not a raw agricultural commodity of soybeans. The tolerance for soybeans, hay should be raised to cover this desiccant use.

The expression negligible residues (N) should be deleted. For a complete listing of appropriate commodity definition changes and recommendations, see Table B.

Tolerances Listed Under 40 CFR §180.364(b):

The tolerances listed in 40 CFR §180.364(b) are for the combined residues of glyphosate and its metabolite AMPA resulting from application of the glyphosate isopropylamine salt and/or glyphosate monoammonium salt for herbicidal and plant growth regulator purposes and/or the sodium sesqui salt for plant regulator purposes.

Sufficient data are available to ascertain the adequacy of the established tolerances listed in 40 CFR §180.364(b) for: liver and kidney of cattle, goats, hogs, horses, poultry, and sheep; peanuts; peanuts, hay; peanuts, hulls; sugarcane; fish; and shellfish. See Table B for modifications in commodity definitions.

Tolerances Listed Under 40 CFR §180.364(c):

The tolerances listed in 40 CFR §180.364(c) are for the combined residues of glyphosate and its metabolite AMPA resulting from the use of irrigation water containing residues of 0.5 ppm following applications on or around aquatic sites, and are established at 0.1 ppm.

Sufficient data are available to ascertain the established tolerances listed in 40 CFR §180.364(c) for the crop groupings Brassica leafy vegetables group; bulb vegetables group; cereal grains group; citrus fruits group; cucurbit vegetables group; foliage of legume vegetables group; forage, fodder, and straw of the cereal grains group; fruiting vegetables group; grass forage, fodder and hay group; leafy vegetables group; leaves of the root and tuber vegetables group; legume vegetables group; non-grass animal feeds group, forage and hay; pome fruits group; root and tuber vegetables group; stone fruits group; tree nuts group; and the individual commodities avocados, cottonseed, and hops. See Table B for modifications in commodity definitions.

Tolerances Listed Under 40 CFR §185.3500:

The tolerances listed in 40 CFR §185.3500(1) are for the combined residues of glyphosate and its metabolite AMPA resulting from the application of the glyphosate for herbicidal purposes and/or the sodium sesqui salt for plant regulator purposes.

Sufficient data are available to ascertain the adequacy of the established food additive tolerances listed in 40 CFR §185.3500(1) for sugarcane, molasses. See Table B for modifications in commodity definitions.

The tolerances listed in 40 CFR §185.3500(2) are for the combined residues of glyphosate and its metabolite AMPA resulting from the application of the isopropylamine salt of glyphosate for herbicidal purposes.

Sufficient data are available to ascertain the adequacy of the established food additive tolerances listed in 40 CFR §185.3500(2) for olives (imported), palm oil, dried tea and instant tea. See Table B for modifications in commodity definitions.

A 12-ppm food additive tolerance for wheat milling fractions (except flour) has been proposed (FAP2H5635). To achieve compatibility with the Codex MRL for wheat bran, unprocessed, the U.S. tolerance should be established at 40 ppm (see Table C).

Food additive tolerances must be proposed for residues of glyphosate in potatoes, chips and potatoes, granules (1 ppm each). The available processing data indicate that combined residues of glyphosate concentrate ca. 4-5x in potato chips and granules.

Tolerances Listed Under 40 CFR §186.3500:

The tolerances listed in 40 CFR §186.3500(a) are for the combined residues of glyphosate and its metabolite AMPA.

Sufficient data are available to ascertain the adequacy of the established feed additive tolerances listed in 40 CFR §186.3500(a) for dried citrus pulp and soybean hulls. See Table B for modifications in commodity definitions.

A tolerance has recently been established at 1.0 ppm for the combined residues of glyphosate and AMPA in citrus, molasses (FR 42701, 9/16/92).

Feed additive tolerances must be proposed for combined residues of glyphosate and AMPA in potatoes, waste from processing (1.0 ppm). The available processing data indicate that combined residues of glyphosate concentrate ca. 4-5x in dry peel and 2.4x in wet peel.

Table B. Tolerance Reassessment Summary

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/Correct Commodity Definition
Tolerances listed under 180.364(a):			
Acerola	0.2		
Alfalfa	200.0	Revoke and establish at 100	<i>Non-grass animal feeds group, forage and hay</i>
Alfalfa, fresh and hay	0.2		
Clover	200.0		
Forage legumes (except soybeans and peanuts)	0.4		
Almond hulls	1		<i>Almonds, hulls</i>
Artichokes, Jerusalem	0.2		
Asparagus	0.5		
Atemoya	0.2		
Avocados	0.2		
Bahia grass	200.0	Revoke and establish at 100	<i>Grass forage, fodder, and hay group</i>
Bermuda grass	200.0		
Bluegrass	200.0		
Brome grass	200.0		
Fescue	200.0		
Forage grasses	0.2		
Grasses, forage	0.2		
Orchard grass	200.0		
Rye grass	200.0		
Timothy	200.0		
Wheat grass	200.0		
Bananas	0.2		
Beets	0.2		<i>Beets, garden, roots</i>
Beets, sugar	0.2		<i>Sugar beets</i>
Breadfruit	0.2	Revoke	No registered uses
Canistel	0.2	Revoke	No registered uses
Carambola	0.2		
Carrots	0.2		
Cherimoya	0.2	Revoke	No registered uses
Chickory	0.2		<i>Chicory, roots</i>
Citrus fruits	0.2		<i>Citrus fruits group</i>
Cocoa beans	0.2	Revoke	No registered uses
Coconut	0.1	Revoke	No registered uses
Coffee beans	1		<i>Coffee beans, green</i>
Cotton, forage	15		
Cotton, hay	15	Revoke	Not in Table II, Subdivision O, PAG
Cottonseed	15		

(continued)

Table B (Continued).

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/Correct Commodity Definition
40 CFR §180.364(a) continued:			
Cranberries	0.2	Revoke	Covered under small fruits and berries group
Dates	0.2	Revoke	No registered uses
Figs	0.2		
Forage grasses	0.2	0.2	<i>Forage, fodder, and straw of cereal grains group (except wheat straw)</i>
Grasses, forage	0.2		
Fruits, small and berries	0.2		<i>Small fruits and berries group</i>
Genip	0.2	Revoke	No registered uses
Grain crops	0.1		<i>Cereal grains group (except wheat)</i>
Grapes	0.2	Revoke	Covered under small fruits and berries group
Guavas	0.2		
Horseradish	0.2		
Jaboticaba	0.2	Revoke	No registered uses
Jackfruit	0.2	Revoke	No registered uses
Kiwifruit	0.2	0.1	Codex harmonization (see Table C)
Leafy vegetables	0.2		<i>Leafy vegetables (except Brassica) group and Leaves of root and tuber vegetables group</i>
Longan	0.2		<i>Longan fruit</i>
Lychee	0.2		
Mamy sapote	0.2		<i>Sapote</i>
Mangoes	0.2		
Nuts	0.2		<i>Tree nuts group</i>
Olives	0.2		
Papayas	0.2		
Parsnips	0.2		<i>Parsnips, roots</i>
Passion fruit	0.2		
Peanut, forage	0.5		<i>Peanuts, vines</i>
Persimmons	0.2	Revoke	No registered uses
Pineapple	0.1		<i>Pineapples</i>
Pistachio nuts	0.2		<i>Pistachios</i>

(continued)

Table B (Continued).

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/Correct Commodity Definition
40 CFR §180.364(a) continued:			
Pome fruits	0.2		<i>Pome fruits group</i>
Potatoes	0.2		
Radishes	0.2		<i>Radishes, root</i>
Rutabagas	0.2		<i>Rutabagas, root</i>
Salsify	0.2	Revoke	No registered uses
Sapodilla	0.2		
Sapote, black	0.2	Revoke	No registered uses
Sapote, white	0.2	Revoke	No registered uses
Seed and pod vegetables	0.2	5	Codex harmonization (see Table C); <i>Legume vegetables group (except soybeans)</i>
Seed and pod vegetables, forage	0.2	0.2	<i>Foliage of legume vegetables group (except soybean forage and hay)</i>
Seed and pod vegetables, hay	0.2		
Soursop	0.2	Revoke	No registered uses
Soybeans	20		
Soybeans, forage	15		
Soybeans, hay	15	200	Raised to cover dessicant use.
Soybeans, straw	200	Revoke	Not in Table II, Subdivision O, PAG
Stone fruit	0.2		<i>Stone fruits group</i>
Sugar apple	0.2		
Sweet potatoes	0.2		
Tamarind	0.2	Revoke	No registered uses
Turnips	0.2		<i>Turnips, roots</i>
Vegetables, bulb	0.2		<i>Bulb vegetables group</i>
Vegetables, cucurbit	0.5		<i>Cucurbit vegetables group</i>
Vegetables, fruiting (except cucurbits) group	0.1		<i>Fruiting vegetables group</i>
Vegetables, leafy, Brassica (cole)	0.2		<i>Brassica leafy vegetables group</i>
Yams	0.2		
Wheat, grain	N/A	5.0	Codex harmonization; see Table C
Wheat, straw	N/A	85 (proposed)	

(continued)

Table B (Continued).

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/Correct Commodity Definition
Tolerances listed under 40 CFR §180.364(h):			
Cattle, kidney	0.5	2.0	Codex harmonization (see Table C)
Cattle, liver	0.5	2.0	Codex harmonization (see Table C)
Fish	0.25		
Goats, kidney	0.5		
Goats, liver	0.5		
Hogs, kidney	0.5	1.0	Codex harmonization (see Table C)
Hogs, liver	0.5	1.0	Codex harmonization (see Table C)
Horses, kidney	0.5		
Horses, liver	0.5		
Peanuts	0.1		
Peanut, hay	0.5		<i>Peanuts, hay</i>
Peanut, hulls	0.5		<i>Peanuts, hulls</i>
Poultry, kidney	0.5		
Poultry, liver	0.5		
Sheep, kidney	0.5		
Sheep, liver	0.5		
Shellfish	3.0		
Sugarcane	2.0		
Tolerances listed under 40 CFR 180.364(c):			
Avocados	0.1		
Citrus	0.1		<i>Citrus fruits group</i>
Cottonseed	0.1		
Cucurbits	0.1		<i>Cucurbit vegetables group</i>
Forage grasses	0.1		<i>Grass forage, fodder, and hay group</i>
Forage legumes	0.1		<i>Non-grass animal feeds group, forage and hay</i>
Fruiting vegetables	0.1		<i>Fruiting vegetables group</i>
Grain crops	0.1		<i>Cereal grains group and Forage, fodder, and straw of cereal grains group</i>

(continued)

Table B (Continued).

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/Correct Commodity Definition
40 CFR 180.364(c) continued:			
Hops	0.1		
Leafy vegetables	0.1		<i>Leafy vegetables (except Brassica) group and Brassica (cole) leafy vegetables group</i>
Nuts	0.1		<i>Tree nuts group</i>
Pome fruits	0.1		<i>Pome fruits group</i>
Root crop vegetables	0.1		<i>Root and tuber vegetables group and Leaves of root and tuber vegetables group and Bulb vegetables group</i>
Seed and pod vegetables	0.1		<i>Legume vegetables group and Foliage of legume vegetables group</i>
Stone fruit	0.1		<i>Stone fruits group</i>
Tolerances listed under 40 CFR §185.3500(a)(1):			
Molasses, sugarcane	30.0		<i>Sugarcane, molasses</i>
Tolerances listed under 40 CFR §185.3500(a)(2):			
Oil, palm	0.1		<i>Palm oil, refined</i>
Olives, imported	0.1		
Potatoes, chips	N/A	1.0	New tolerance needed
Potatoes, granules	N/A	1.0	New tolerance needed
Tea, dried	1.0		
Tea, instant	7.0	Revoke	Not in Table II, Subdivision O, PAG
Wheat milling fractions (except flour)	N/A	40	Codex harmonization; see Table C
- Tolerances listed under 40 CFR §186.3500(a):			
Citrus, pulp, dried	1.0		
Citrus molasses	1.0		<i>Citrus, molasses</i>
Potatoes, waste from processing	N/A	1.0	New tolerance needed
Soybean hulls	100		<i>Soybeans, hulls</i>

CODEX HARMONIZATION

Several maximum residue limits (MRLs) for glyphosate have been established by Codex in various commodities. The Codex MRLs (currently expressed in terms of glyphosate per se) and applicable U.S. tolerances (expressed in terms of the combined residues of glyphosate and its metabolite AMPA) are listed in Table C. The HED Metabolism Committee has determined that AMPA no longer needs to be regulated and therefore will be deleted from the tolerance expression. Based on the Committee's determination, the expression of the U.S. tolerances and the Codex MRLs will be harmonized, and both will now be expressed in terms of glyphosate per se.

Table C. Codex MRLs and applicable U.S. tolerances. Recommendations for compatibility are based on conclusions following reassessments of U.S. tolerances (see Table B).

Commodity	MRL (Step) (mg/kg)	U.S. Tolerance (ppm)	Recommendation
Barley	20 (CXL)	0.1 (Cereal grains group, except wheat)	
Beans (dry)	2 (CXL)	0.2 (Legume vegetables group, except soybeans)	
Cattle meat	0.1(CXL)		
Cattle milk	0.1(CXL)		
Cattle, edible offal	2 (CXL)	0.5 (Cattle, liver & kidney)	increase U.S. tolerances
Cottonseed	0.5(CXL)	15	
Eggs	0.1(CXL)		
Hay or fodder (dry) of grasses	50 (CXL)	100 (Grass forage, fodder, and hay group)	
Kiwifruit	0.1(CXL)	0.2	decrease U.S. tolerance
Maize	0.1(CXL)	0.1	
Oats	20 (CXL)	0.1 (Cereal grains group, except wheat)	
Peas (dry)	5 (CXL)	0.2 (Legume vegetables group, except soybeans)	increase U.S. tolerance
Pig meat	0.1(CXL)		
Pig, edible offal	1 (CXL)	0.5 (Hogs, liver & kidney)	increase U.S. tolerances
Poultry meat	0.1(CXL)		
Rape seed	10 (CXL)		
Rice	0.1(CXL)	0.1 (Cereal grains group, except wheat)	
Sorghum	0.1(CXL)	0.1 (Cereal grains group, except wheat)	
Soya bean fodder	20 (Step 8)	15 (Soybeans, hay)	
Soya bean forage (green)	5 (Step 8)	15 (Soybeans, forage)	
Soya bean (dry)	5 (Step 8)	20 (Soybeans)	
Soya bean (immature seeds)	0.2(CXL)		
Straw and fodder (dry) of cereal grains	100 (CXL)	0.2 (Forage, fodder, and straw of cereal grains group, except wheat straw)	
Sweet corn (corn-on-the-cob)	0.1(CXL)	0.1 (Cereal grains group, except wheat)	
Wheat	5 (CXL)	4 (proposed)	increase U.S. tolerance proposal
Wheat bran, unprocessed	40 (Step 6)	12 (proposed)	increase U.S. tolerance proposal
Wheat flour	0.5(Step 8)		
Wheat wholemeal	5 (Step 8)	12 (proposed)	

The following conclusions can be made regarding efforts to harmonize the U.S. tolerances with the Codex MRLs:

- ◆ Compatibility between the U.S. tolerances and permanent Codex MRLs exists in or on: corn (field and sweet); rice; and sorghum.
- ◆ The levels of U.S. tolerances should be increased, toxicological and DRES considerations permitting, to achieve compatibility with the Codex MRLs in or on the following commodities: (i) liver and kidney of cattle (from 0.5 to 2.0 ppm); (ii) liver and kidney of hogs (from 0.5 to 1.0 ppm); and (iii) legume vegetables group (except soybeans) (from 0.2 to 5 ppm);
- ◆ The level of the U.S. tolerance should be decreased to achieve compatibility with the Codex MRLs in or on kiwifruit (from 0.2 to 0.1 ppm).
- ◆ The U.S. tolerances in or on the following commodities were based on registered use patterns in the U.S. and cannot be lowered to achieve compatibility with the Codex MRLs: (i) grass forage, fodder, and hay group; (ii) soybeans; and (iii) soybeans, forage.
- ◆ Wheat grain and wheat bran tolerances of 4 and 12 ppm, respectively, have been proposed. To achieve compatibility with Codex, these tolerance levels should be increased, toxicological and DRES considerations permitting, to 5 and 40 ppm, respectively.
- ◆ Wide differences (>5x) exist between the U.S. tolerances and permanent Codex MRLs in or on the following commodities: barley; beans (dry); soybeans, hay; cottonseed; oats; forage, fodder, and straw of cereal grains. The decision to harmonize residue levels in or on these commodities cannot be made at this time.
- ◆ No questions of compatibility exist with respect to commodities where: (i) no Codex MRLs have been established, but U.S. tolerances exist; and (ii) Codex MRLs have been established, but U.S. tolerances do not exist.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No.: 398
 Subject: EPA Reg. No. 524-308. Glyphosate ropewick wiper on sorghum.
 Additional data received 10/12/84. Accession No. 255024.
 From: K. Dockter
 To: Robert Taylor
 Dated: 8/8/85
 MRID(s): None

CBRS No.: 409
 Subject: PP#3F2956, Glyphosate on Shellfish. Evaluation of Supplemental Data
 Submission of December 13, 1985 (Accession Numbers 260534, 260497;
 RCB No. 409).
 From: E. Haeberer
 To: Robert Taylor & Toxicology Branch
 Dated: 4/10/86
 MRID(s): 00155120 and 00154311

CBTS Nos. 537 and 538
 Subject: PP3F2809/FAP5H5450: Glyphosate in or on Wheat Grain and Wheat
 Straw. Amended Section F and D, letter of 11/13/84 and new Food
 Additive Petition.
 From: R. Cook
 To: R. Taylor & Toxicology Branch
 Dated: 4/18/85
 MRID(s): 00150835

CBTS Nos. 546
 Subject: PP#5F3170. (RCB #546) Glyphosate on sugar cane and animal
 commodities. Evaluation of analytical method and residue data
 (Amendment to 40 CFR 180.364). Accession No. 073023.
 From: C. Deyrup
 To: R. Taylor & Toxicology Branch
 Dated: 2/14/85
 MRID(s): None

CBTS Nos. 564 and 565
Subject: 5F3157/5H5446: Glyphosate on peanuts. Evaluation of analytical methods and residue data. Accession No. 072983.
From: M. Bradley
To: R. Taylor & Toxicology Branch
Dated: 5/1/85
MRID(s): None

CBTS Nos. 889 and 890
Subject: PP#6F3380/6H5502: Glyphosate (Roundup) in or on Soybeans. Evaluation of Analytical Method and Residue Data. (Acc. #261638; RCB #889 and #890).
From: W.T. Chin
To: R. Taylor & Toxicology Branch
Dated: 10/24/86
MRID(s): None

CBTS No.: 1325
Subject: PP#5F3170 (RCB #1325) Glyphosate on sugar cane and animal commodities. Amendment of 8/16/85. No Accession No.
From: C. Deyrup
To: Robert Taylor & Toxicology Branch
Dated: 9/2/86
MRID(s): None

CBRS No.: 1342
Subject: PP#3F2956, Glyphosate on Shellfish. Revised Label Submission (No Accession Number; RCB No. 1342).
From: E. Haerberer
To: Robert Taylor & Toxicology Branch
Dated: 10/16/86
MRID(s): 00155120 and 00154311

CBTS No.: 1528
 Subject: PP#6E3424 (RCB#1528) - Glyphosate on Atemoya, Carambola and Sugar Apple - Evaluation of Analytical Methodology and Residue Data (Accession No. 263498).
 From: M. Firestone
 To: H. Jamerson
 Dated: 9/30/86
 MRID(s): None

CBTS No.: 2344 and 2345
 Subject: PP5F2809/FAP5H5450. Glyphosate on wheat from wiper application. Amended Section F and letter dated Dec. 12, 1986.
 From: R. W. Cook
 To: R. Taylor & Toxicology Branch
 Dated: 7/24/87
 MRID(s): None

CBRS No.: 2346 and 2347
 Subject: PP#6F3380/FAP#6H5502 - Glyphosate in/on Soybeans (RCB#'s 2346 and 2347). Amendment from Monsanto dated 2/20/87. Glyphosate Registration Standard. Product chemistry for isopropylamine and sodium sesqui salts; nitrosamines. Response by Monsanto (letter dated 3/24/87) to the 3(c)2(B) letter of 8/11/86. (MRID#'s 401548-01, -02, -03, -01C, -02C, -03C, and Acc# 263795).
 From: J. Stokes
 To: R. Taylor & Toxicology Branch
 Dated: 9/1/87
 MRID(s): 40154801-40154803.

CBRS Nos.: 2356
 Subject: Glyphosate on Shellfish, PP#3F2956, Revised Section B Submission of March 1987, (No Accession No., RCB#2356).
 From: E.T. Haerberer
 To: R. Taylor & Toxicology Branch
 Dated: 7/8/87
 MRID(s): None

CBTS Nos.: 2357
 Subject: PP#6F3408 (RCB No. 2357) - Glyphosate on Sunflower Seeds -
 Amendment dated January 29, 1987 (No Accession Number).
 From: N. Dodd
 To: R. Taylor & Toxicology Branch
 Dated: 7/29/87
 MRID(s): None

CBTS Nos.: 2369-2371
 Subject: Glyphosate on citrus fruits.
 From: M. Nelson
 To:
 Dated: 7/20/87
 MRID(s): 40159401

CBRS Nos.: 2372-2374
 Subject: EPA Registration Nos. 524-318, -333, and -339 Glyphosate. Comparison
 of Analytical Methods and Response to Registration Standard.
 (Accession Nos. 265985 and 262896).
 From: F. Griffith
 To: R. Taylor & Toxicology Branch
 Dated: 9/25/87
 MRID(s): 00164729

CBTS No.: 3841
 Subject: PP#8E3631. (RCB# 3841) Glyphosate on Leafy Vegetables (except
 Brassica). Evaluation of the Analytical Method and the Residue Data.
 From: C. Deyrup
 To: H. Jamerson & Toxicology Branch
 Dated: 7/5/88
 MRID(s): 40578000 through 40578003.

CBTS No.: 3967
 Subject: PP8E3648. Glyphosate on Asparagus. Evaluation of Analytical Methods
 and Residue Data.
 From: R. Cook
 To: H. Jamerson & Toxicology Branch
 Dated: 9/8/88
 MRID(s): 40642400-40642401

CBTS No.: 4284
Subject: Petition Review for Establishment of Tolerance(s).
Evaluation of Analytical Method(s) and Residue Data. PP#8E3676.
From: M. Nelson
To: H. Jamerson & Toxicology Branch
Dated: 10/20/88
MRID(s): 40783101

CBTS Nos.: 4285 and 4286
Subject: PP#6F3380/6H5502. Glyphosate (Roundup (R)) in or on Soybeans.
Amendment of 7/22/88 and Registration Standard Data Follow-up.
From: W. Chin
To: R. Taylor & Toxicology Branch
Dated: 1/30/89
MRID(s): 40532001-40532004 and 40541301-40541303

CBTS No: 4287
Subject: PP8F3665. Glyphosate on Peanuts. Evaluation of Analytical Methods and
Residue Data. RCB No. 4287. No. 407507-02. RCB Project #8-1086A.
From: R. Cook
To: R. Taylor & Toxicology Branch.
Dated: 11/22/88
MRID(s): 40750702

CBTS No.: 4289
Subject: PP#8F3673/EPA Registration No. 524-308 - Glyphosate for Use In or On
Field Corn - MRID Nos. 405026-01, -03, and -05 - Evaluation of
Analytical Method and Residue Data.
From: M. Flood
To: R. Taylor & Toxicology Branch
Dated: 2/1/89
MRID(s): 40502601, 40502603, and 40502605

CBTS Nos.: 4357 and 4358
Subject: Petition Review for Establishment of Tolerance(s).
Evaluation of Analytical Method(s) and Residue Data.
PP8F3672 and PP8H5562.
From: S. Willet
To: R. Taylor & Toxicology Branch
Dated: 11/18/88
MRID(s): 40502602, 40502604, and 40502605

CBTS No: 4361
Subject: PP8E3682. Glyphosate (Roundup) in or on Brassica (Cole) Leafy
Vegetables Crop Group. EPA Reg. No. 524-308. IR-4 Response to the
Registration Standard Data Call-In, June, 1986.
From: F. Toghrol
To: H. Jamerson
Dated: 12/9/88
MRID(s): 40802800-40802802

CBRS No.: None
Subject: Glyphosate. PP#6F3380/FAP#6H5502. Withdraw of Request for a
Petition Validation of a HPLC Method (Acc#262896).
From: J. Stokes
To: D. A. Marlow
Dated: 2/9/89
MRID(s): None

CBTS No.: 4503
Subject: Petition Review for Establishment of Tolerance(s). Evaluation of Analytical
Method(s) and Residue Data. PP#8E3696.
From: M. Nelson
To: H. Jamerson & Toxicology Branch
Dated: 2/10/89
MRID(s): 40835200-01

CBTS No.: 4685
Subject: PP#8H5568. Glyphosate in or on Dried Citrus Pulp, Citrus Molasses, and Instant Tea. Tolerance Revisions Pursuant to the Glyphosate Registration Standard.
From: M. Nelson
To: R. Taylor/V. Walters & Toxicology Branch
Dated: 3/22/89
MRID(s): None

CBTS No.: 4907
Subject: Petition Review for Establishment of Tolerance(s). Evaluation of Analytical Method(s) and Residue Data. PP#9E3715.
From: M. Nelson
To: H. Jamerson
Dated: 4/5/89
MRID(s): None

CBTS No.: 5057
Subject: PP8F3665. Glyphosate (sodium sesqui salt) on peanuts. Letter 2/1/89. No MRID No., DEB No. 5057.
From: R. W. Cook
To: R. J. Taylor & Toxicology Branch
Dated: 3/31/89
MRID(s): None

CBTS No.: 5196
Subject: PP#9E3754: Glyphosate in/on Some Tropical and Sub-tropical Minor Tree Crops. Evaluation of Analytical Methods and Residue Data.
From: W. Chin
To: H. Jamerson & Toxicology Branch
Dated: 9/19/89
MRID(s): 40149400-01

CBTS No.: 5327
Subject: PP#9E3715. Glyphosate in or on Longan, Lychee, Mamey Sapote, Sapodilla, and Passion Fruit. Amendment of April 20, 1989.
From: M. Nelson
To: H. Jamerson & Toxicology Branch
Dated: 6/8/89
MRID(s): None

CBTS Nos.: 6740-6742
Subject: PP8F3672/8H5562 - Glyphosate on Grain Sorghum.
From: S. Willet
To: R. Taylor and Toxicology Branch
Dated: 9/5/90
MRID(s): 41472002

CBRS Nos.: 6745 and 6746
Subject: PP8F6373 - Glyphosate on Field Corn.
From: F. Griffith
To: R. Taylor
Dated: 7/13/90
MRID(s): 41478101

CBTS Nos.: 6748-6750
Subject: PPOF3865. Glyphosate on Wheat Grain and Straw. Evaluation of Analytical Methods and Residue Data.
From: R. Cook
To: R. Taylor & Toxicology Branch
Dated: 1/29/91
MRID(s): 41488301

CBTS No.: 6827
Subject: PP#0E3857 Glyphosate on cocoa beans.
From:
To:
Dated: 7/24/90
MRID(s): None

CBTS No.: 6828
Subject: PP#3E3873 Glyphosate on genip.
From:
To:
Dated: 7/20/90
MRID(s): None

CBTS No.: 6935
Subject: PP#0E3873 Glyphosate on genip.
From:
To:
Dated: 9/5/90
MRID(s): None

CBTS No.: 6938
Subject: PP#0E3881 Glyphosate on cherimoya.
From:
To:
Dated: 9/5/90
MRID(s): None

CBTS No.: 7275
Subject: PP#0E3881 Glyphosate on cherimoya.
From:
To:
Dated: 11/10/90
MRID(s): None

CBTS No.: 7915
Subject: PP#0E3857 Glyphosate on cocoa beans.
From:
To:
Dated: 4/23/91
MRID(s): None

CBRS Nos.: 8196 and 8220
 Subject: Monsanto Company: Response to the Glyphosate Reregistration Standard: Product and Residue Chemistry Data.
 From: R. Perfetti
 To:
 Dated: 2/3/92
 MRID(s): 00156793

CBRS No.: 8337
 Subject: Monsanto Agricultural Chemical Corp.: Response to the Glyphosate Reregistration Standard: Storage Stability Data.
 From: R. Perfetti
 To: W. Burnam and L. Rossi
 Dated: 4/2/92
 MRID(s): 41940701

CBRS No.: 8367
 Subject: Glyphosate on Potatoes, Corn, Sorghum, Grapes, Plums/Prunes, Sugar Beets, and Peanuts. Impact of Craven Analytical Data on Registrations.
 From: M. Metzger
 To: P. Bagley
 Dated: 10/21/92
 MRID(s): 41947001-41947006

CBRS No.: 9674
 Subject: Glyphosate: Monsanto Response to the Registration Standard and data waiver requests: coffee, peanuts, sugarcane, wheat processed fractions.
 From: D. McNeilly
 To: E. Feris
 Dated: 7/9/92
 MRID(s): None

CBTS Nos.: 9686-9690
 Subject: PP#0F3865/FAP#2H5635. Glyphosate on Wheat Grain and Straw and Wheat Milling Fractions. Letter of 2/28/92.
 From: R. Cook
 To: R. Taylor and Toxicology Branch
 Dated: 5/29/92
 MRID(s): None

CBRS No.: 10105
Subject: Glyphosate: Storage Stability Data.
From: R. Perfetti
To:
Dated:
MRID(s):

CBRS No.: 10124
Subject: Response to the Glyphosate reregistration Standard: Product and Residue Chemistry.
From: R. Perfetti
To: L. Rossi and E. Saito
Dated: 8/26/92
MRID(s): 00144301, 41573601, and 41940701

CBRS No.: 10256
Subject: Glyphosate: Olives and olive-processing studies.
From: R. Perfetti
To: L. Rossi and E. Saito
Dated: 10/8/92
MRID(s): 42398401



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