UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

9/22/94

September 22, 1994

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

NOTE TO THE LINURON FILE

SUBJECT: CBRS Reregistration Eligibility Document for Linuron -- Product Chemistry Section (dated February 15, 1994)

This CBRS document implies that the DuPont's use of [redacted] as an alternate soruce for its product (EPA Reg. # 352-326) has been approved. However, at the time that this document was written, the [redacted] source for DuPont has not been approved by the Registration Division. RD is awaiting the review of product chemistry data to support DuPont's use of [redacted] as an alternate source.

Karen Jones

Karen Jones
SRRD Case Manager for Linuron

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

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Recycled/Recyclable
Printed on paper that contains
at least 75% recycled fiber

Saito

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 15 1994

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: Linuron Reregistration Eligibility Document (RED).
CBRS No.: 12392; MRIDs: N/A; DP Barcode: D194477.

FROM: Dennis McNeilly, Chemist
Special Review Section II
Chemistry Branch II - Reregistration Support
Health Effects Division [H7509C]

THRU: Francis B. Suhre, Section Head
Special Review Section II
Chemistry Branch II - Reregistration Support
Health Effects Division [H7509C]

TO: Lois Rossi, Chief
Reregistration Branch
Special Review and Reregistration Division (7508W)
and
Esther Saito, Chief
Chemical Coordination Branch
Health Effects Division (H7509C)

Attached are the Product and Residue Chemistry Chapters for the Linuron RED. These documents were prepared by Dynamac Corporation and have been revised by CBRS, HED to reflect Branch policies.

PRODUCT CHEMISTRY

All product chemistry data submitted (through 11/30/93) in support of the reregistration of linuron manufacturing-use products have been reviewed. CBRS has no objection to the reregistration of linuron with respect to product chemistry data requirements, pending clarification of the sources of Drexel's technical products.

RESIDUE CHEMISTRY

All residue chemistry data submitted, through 11/30/93, in support of linuron reregistration have been reviewed.

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Sufficient residue data are available to support established linuron tolerances for all registered uses on: celery; cottonseed; parsnips; potatoes; and sorghum, grain (see Table C).

Additional residue data are needed if all current registered uses of linuron are to be covered by established tolerances for: asparagus; carrots; corn, field, grain; corn, field, forage and fodder; corn, sweet (K + CWHR); corn, sweet, forage; sorghum forage and fodder; soybeans; wheat, grain; and wheat forage and straw (see table C).

Residue data are outstanding and must be provided to establish required tolerances for corn grain dust and cottonseed processed fractions (see Table C).

Residue data are available to support required food additive tolerances for: potatoes, granules at 0.8 ppm and potatoes, chips at 0.6 ppm; and a required feed additive tolerance on potatoes, waste from processing at 10 ppm. Delaney issues may prevent the establishment of these tolerances (see Table D).

Established linuron tolerances for barley, oats, and rye forage, grain, hay, and straw should be revoked since there are no registered uses of linuron on these commodities (see Table D).

Established tolerances for sweet corn fodder, parsnips tops, and wheat hay should be revoked since these commodities are not listed in Table II as raw agricultural commodities of sweet corn, parsnips, and wheat, respectively (see Table D).

Established tolerances for soybean forage and hay should be revoked since restrictions against the feeding of these commodities to livestock exist on all pertinent linuron product labels (see Table D).

DIETARY EXPOSURE

CBRS considers the existing data base sufficient to assess linuron dietary exposure and to reassess most existing linuron tolerances.

Uncertainties associated with estimating dietary exposure to linuron are lessened because the metabolism of linuron in plant and animal is adequately understood and because the available residue data from field trials, processing studies, and animal feeding studies are sufficient to estimate dietary exposure resulting from registered uses of linuron. The dietary exposure estimate for linuron is based on field residue data from field trials which generally reflect a conservative estimate.

Field trial data are outstanding for soybeans and corn. Treatment of soybeans is a major linuron use. However, previous dietary exposure estimates conducted in connection with the Linuron Special Review indicate that linuron residues in these

commodities will be low. Therefore, this source of uncertainty should not significantly affect the linuron risk estimate one way or the other.

Linuron storage stability data are considered confirmatory . Data currently available indicate that linuron residue are stable in frozen storage. Thus these data should not impact the exposure estimate/risk estimate.

Anticipated residue estimates provided to DRES in connection with a 1987 Linuron Special Review have been revised as described in the Dietary Exposure Section of the Residue Chemistry Chapter.

Attachment: Product and Residue Chemistry Chapters for the Linuron Reregistration Eligibility Document.

CC: D.McNeilly;SF;RF:Reg Std File;Circ;DRES(J.Kariya);Dynamac.
RDI:FBS,2/10/94;MM,2/10/94;EZ,2/14/94.
H7509C:DMM;dmm;CM-2;Rm804F;X305-5934;2/14/94.

DYNAMAC
CORPORATION
Environmental Services

Final Report

LINURON
Shaughnessy No. 035506; Case No. 0047 (CBRS No. 12392; DP Barcode D194477)

TASK 2A
Reregistration Eligibility Document: Product Chemistry Considerations

December 9, 1993

Contract No. 68-D2-0053

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

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

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LINURON

REREGISTRATION ELIGIBILITY DOCUMENT:

PRODUCT CHEMISTRY CONSIDERATIONS

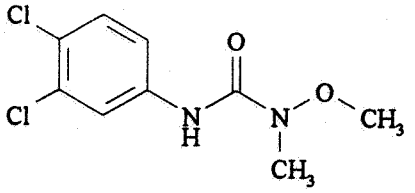
Shaughnessy No. 035506; Case No. 0047

(CBRS No. 12392; DP Barcode D194477)

TASK 2A

DESCRIPTION OF CHEMICAL

Linuron [3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea], a substituted urea compound, is a selective herbicide used for preemergent and postemergent control of many annual grasses and broadleaf weeds on food and nonfood sites.



Empirical Formula: $C_9H_{10}Cl_2N_2O_2$
Molecular Weight: 249.1
CAS Registry No.: 330-55-2
Shaughnessy No.: 035506

IDENTIFICATION OF ACTIVE INGREDIENT

Technical linuron is an odorless, white crystalline flake or powder with a melting range of 86-91 C. Linuron is soluble in water at 81 mg/L at 25 C, and is slightly soluble in aliphatic hydrocarbons and moderately soluble in ethanol and common aromatic solvents.

MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 9/14/93 identified the linuron manufacturing-use products (MPs) listed in Table 1 registered under Shaughnessy No. 035506. At the time of the Linuron Guidance Document dated 6/29/84 the du Pont 92% technical (T) and a 50% formulation intermediate (FI), the Griffin 95% T, and one Drexel 95% T were registered. Since the Linuron Reregistration Standard Update was issued in 1990, the du Pont 50% FI has been canceled and two additional Drexel 95% Ts

have been registered. The products listed in Table 1 are the only MPs subject to a reregistration eligibility decision, and according to the available data, the only current producers of linuron technical are Makteshim-Agan, Israel and Industria Prodotti Chimici, Italy (I.Pi.Ci.).

Table 1. Registered MPs of linuron.

Formulation	EPA Reg. No.	Registrant	Source(s)	Date Registered
92% T	352-326	E.I. du Pont de Nemours	[redacted]	2/67
95% T	1812-270	Griffin Corporation	[redacted]	2/83
95% T	19713-158	Drexel Chemical Company	undetermined *	10/82
95% T	19713-367		undetermined *	11/92
95% T	19713-368		undetermined *	11/92

* Undetermined: CBRS is unable to determine the source for these products due to conflicting information.

When the Linuron Update was issued, technical linuron for du Pont was produced by du Pont at the La Porte plant and [redacted] was initially denied registration as an alternate source for du Pont because of differences in the levels of the active ingredient and different impurities. Following further examination of the data by TOX branch, [redacted] linuron was approved as an alternate source of the du Pont linuron technical in January 1993. Du Pont has indicated that due to decreasing demand for linuron and the approval of [redacted] alternate source, du Pont no longer produces linuron.

Although [redacted] were originally the producers of the Griffin linuron technical, Griffin confirmed by letter to the Agency in 1991 that they had canceled the [redacted] would be the only source of Griffin technical linuron. Du Pont has agreed to share data submitted for the [redacted] with Griffin.

Drexel has relied on "me-too" registrations of repackaged linuron produced by various sources for their technical products. When the Linuron Update was issued in 1990, Drexel listed [redacted] (EPA Reg. No. 19713-158). Confidential Statements of Formula dated 1992 for the other two 95% Ts (EPA Reg. Nos. 19713-367 and 19713-368) indicate that they are repackaged from the [redacted] However, [redacted] has indicated by several letters to the Agency that Drexel does not purchase [redacted] linuron. Because Drexel withdrew the [redacted] in 1992, and Griffin has canceled

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

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the [redacted] alternate source, Drexel is left with no apparent sources for the three registered technical products. Drexel must resolve the status of the three registered products.

REGULATORY BACKGROUND

Assessments as to whether the various sources of technical linuron are substantially similar have been an integral part of the scientific review of the product chemistry database submitted in support of reregistration. The Linuron Guidance Document dated 6/29/84 required that additional data concerning all product chemistry topics be submitted in support of the reregistration of linuron. In addition, the Agency initiated a Special Review in 1984 because linuron was found to exceed the oncogenicity risk criteria. Special Review ended in 1988 due to the reclassification of linuron as a nonquantifiable Class C oncogen. The Linuron Reregistration Standard Update, dated 6/20/90, required additional data for the du Pont 92% T and 50% FI, the [redacted] formulations of the Griffin 95% T, and the proposed alternate [redacted] formulation for the Drexel 95% T. Because sources for the registered technical products have changed repeatedly since the Linuron Update, the data requirements have also changed. The current status of the product chemistry data requirements for linuron products is presented in the attached data summary tables. Refer to these tables for a listing of the outstanding product chemistry data requirements.

CONCLUSIONS

All pertinent TGAI data requirements are satisfied for the du Pont linuron technical produced by [redacted] Only the nominal concentrations of the product components remain outstanding for the MP requirements for [redacted] source. All of the registrants of linuron products must confirm the sources of linuron used for their products. Provided that the registrants submit the data required in the attached data summary tables for the linuron technical products, and either certify that the suppliers of the starting materials and the manufacturing process for the linuron TGAIs and MPs have not changed since the last comprehensive product chemistry review or submit a complete updated product chemistry data package, CBRS has no objections to the reregistration of linuron with respect to product chemistry data requirements.

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

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AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No(s).: 1318
Subject: ID No. 035506: Linuron: Product Chemistry Data for Technical Material Produced by Industria Prodotti Chimici (I.Pi.Ci.).
From: J. Garbus
To: I. Sunzenauer, R. Taylor, V. Walters, and TOX Branch
Dated: 10/28/86
MRID(s): 00162140

CBRS No(s).: 3351
Subject: Polyhalogenated Dibenzo-p-Dioxins/Dibenzofurans Data Call-In, 6/87.
From: M. Flood
To: M. Boodee
Dated: 1/13/89
MRID(s): 40484501

CBRS No(s).: 7799
DP Barcode(s): D163010
Subject: Analysis of Linuron for Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans.
From: S. Funk
To: E. Feris
Dated: 7/24/91
MRID(s): 41817201

CBRS No(s).: 8489
DP Barcode(s): D167782
Subject: Response to the Linuron Reregistration Standard: Product Chemistry.
From: R. Perfetti.
To: L. Rossi and E. Saito
Dated: 8/19/92
MRID(s): 41745201, 41976501, and 41976502

CBRS No(s).: 9527 and 9458
DP Barcode(s): D175278 and D174861
Subject: Response to the Linuron Reregistration Standard: Product Chemistry.
From: E. Zager
To: L. Rossi and E. Saito
Dated: 7/16/92
MRID(s): 42213301 through 42213303

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

CBRS No(s).: 10034 and 10138
DP Barcode(s): D179497 and D179989
Subject: Linuron Registration: Product Chemistry.
From: R. Perfetti
To: R. Taylor and V. Walters
Dated: 8/25/92
MRID(s): 42337701, and 42347701 through 42347703

CBRS No(s).: 10913
DP Barcode(s): D184790
Subject: Linuron; Series 63-13 Product Chemistry Data for [redacted] Alternate Source of Du Pont's 95% T Linuron.
From: D. McNeilly
To: L. Propst
Dated: 12/30/92
MRID(s): None

CBRS No(s).: 11363
DP Barcode(s): D187969
Subject: Linuron: Product Chemistry Data
From: D. McNeilly
To: P. Perreault
Dated: 6/29/93
MRID(s): 42493101

PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements.

References (cited):

00162140 Industria Prodotti Chimici S.p.A. (1986) Linuron Technical: Product Chemistry Data. Unpublished compilation. 202 p.

40484501 Fanelli, R. (1987) Analysis of Trace Amounts of Chlorinated Dibenzo-dioxins and Chlorinated Dibenzo-furans in Samples of Technical Linuron. Unpublished compilation prepared by Instituto di Ricerche Farmacologiche "Mario Negri". 18 p.

41817201 Fanelli, R. (1991) Quantitative Analysis of Chlorinated Dibenzodioxins and Chlorinated Dibenzo-furans in Samples of Technical Linuron: Lab Project Number: 11/90. Unpublished study prepared by Instituto di Ricerche Farmacologiche "Mario Negri". 111 p.

41976501 Steiner, A. (1990) Linuron Technical: Product Chemistry: Lab Project Number: LINU/PCH 26. Unpublished study prepared by Agan Chemical Manufactures, Ltd. 133 p.

41976502 Castles, M. (1990) Determination of TCAB, TCAOB, and TCB in Technical Grade Linuron for Product Chemistry Portion of EPA Registration: Lab Project Number: LINU/PCH-25: 9676-A. Unpublished study prepared by Midwest Research Institute. 25 p.

42213301 Hogg, A. (1992) Linuron: Determination of Physico-Chemical Properties: Lab Project Number: 8/100/A. Unpublished study prepared by Safepharm Laboratories Ltd. 47 p.

42213302 Hogg, A. (1992) Linuron: Determination of Dissociation Constant and Partition Coefficient: Lab Project Number: 8/100/B. Unpublished study prepared by Safephram Labs., Ltd. 17 p.

42213303 Taylor, N. (1992) Linuron: Determination of Vapor Pressure by Balance Method: Lab Project Number: 114308. Unpublished study prepared by Univ. of Leeds. 34 p.

42347701 Industria Prodotti Chimici SpA. (1992) Linuron Technical - Product Chemistry: Preliminary Analysis and Certification of Ingredients: Lab Project Number: 944. Unpublished study. 118 p.

42347702 Fanelli, R. (1992) Confirmation of the Presence and Concentration of 2,3,7,8 TCDF in Technical Linuron (Third Report): Supplement to. Unpublished study prepared by Instituto di Ricerche Farmacologiche "Mario Negri". 11 p.

42347703 Bresnahan, J. (1992) Formal Report of Analysis for N-Nitroso Compounds: Lab Project Number: 5450-7697. Unpublished study prepared by ThermedeTec, Inc. 179 p.

42493101 I.pi.ci. Industria Prodotti Chimici SpA. (1992) Linuron Technical Product Chemistry - Certified Limits: Lab Project Number: 944. Unpublished study prepared by I.pi.ci. Analytical Laboratory. 9 p.

References not reviewed:
(This submission has not been reviewed and may contain information applicable to the outstanding data requirements.)

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42753501 Cadwgan, G. (1993) Du Pont Technical Grade Linuron: Analysis and Certification of Product Ingredients: Dichloroaniline: A Supplement: Lab Project Number: AMR 2239-91. Unpublished study prepared by E.I. du Pont de Nemours and Co. 47 p.

Case No. 0047
Chemical No. 035506

Case Name: Linuron
Registrant: E.I. du Pont de Nemours and Company, Inc.
Product(s): 92% T (EPA Reg. No. 352-326) produced by Agan

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	N [c]	41976501
61-2	Starting Materials and Manufacturing Process	N [d]	41976501
61-3	Discussion of Formation of Impurities	N [e]	41976501
62-1	Preliminary Analysis	N [f]	41976501 41976502
62-2	Certification of Ingredient Limits	N [g]	41976501
62-3	Analytical Methods to Verify the Certified Limits	N [h]	41976501
63-2	Color	Y	**42213301**
63-3	Physical State	Y	**42213301**
63-4	Odor	Y	**42213301**
63-5	Melting Point	Y	**42213301**
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	Y	**42213301**
63-8	Solubility	Y	**42213301**
63-9	Vapor Pressure	Y	**42213303**
63-10	Dissociation Constant	Y	**42213302**
63-11	Octanol/Water Partition Coefficient	Y	**42213302**
63-12	pH	Y	**42213301**
63-13	Stability	Y	**42213301** No MRID
63-14	Oxidizing or Reducing Action	Y	**42213301**
63-15	Flammability	N/A	
63-16	Explodability	N	
63-17	Storage Stability	N	
63-18	Viscosity	N/A	
63-19	Miscibility	N/A	
63-20	Corrosion Characteristics	N	

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

[b] **Bolded** citations were reviewed under CBRS Nos. 9527 and 9458, D175278 and D174861, dated 7/16/92, by E. Zager; underlined citations were reviewed under CBRS No. 8489, D167782, dated 8/19/92, by R. Perfetti; remaining citation (No MRID) was reviewed under CBRS No. 10913, D184790, dated 12/30/92, by D. McNeilly.

[c] These data do not fully satisfy the requirements of 40 CFR §158.155 (Guideline Reference No. 61-1) concerning product identity because (i) two impurities listed on the

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CSF must be correctly identified; (ii) one component must be further characterized; (iii) the nominal concentrations of the impurities listed on the CSF must be reconciled with the results of preliminary analysis; (iv) two impurities listed on the CSF that are pesticidally active must be identified as active ingredients and included in the label claim; and (v) the label claim must be revised to reflect the nominal concentration of the active ingredient rather than the lower certified limit as per PR Notice 91-2 dated 5/2/91. In addition, we note that as per 40 CFR §152.43, this product may not meet the criteria of an alternate formulation because the certified limits for the active ingredient are not the same as those for the basic formulation.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160 and 162 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process because the registrant must provide (i) information concerning the producers and specifications of two starting materials; (ii) the duration of each step and of the entire process; and (iii) a description of any purification measures (including procedures to recover or recycle starting materials, intermediates, or the substance produced).

[e] These data do not fully satisfy the requirements of 40 CFR §158.167 (Guideline Reference No. 61-3) concerning discussion of formation of impurities because the registrant must account for the presence of several impurities listed on the CSF, including tetrachloroazobenzene (TCAB), tetrachloroazoxybenzene (TCAOB), and tetrachlorobiphenyl (TCB), among others. In addition, the registrant must include a complete discussion of the following potential sources of impurities: (i) carryover of starting materials and impurities present or believed to be present in the starting materials; (ii) the degradation of ingredients in the product after its production, but prior to use; (iii) post-production reactions between the ingredients in the product; (iv) migration of packing components into the product; and (v) carryover of contaminants from use of the manufacturing equipment for other products. Finally, because linuron is a secondary alkylamine, the registrant must discuss the potential for formation of nitrosamines.

[f] These data do not fully satisfy the requirements of 40 CFR §158.170 (Guideline Reference No. 62-1) concerning preliminary analysis because preliminary analysis for nitrosamines must be submitted. In addition, complete validation data must be submitted to support the methods used to determine several organic impurities listed on the CSF and the microcontaminants TCAB, TCAOB, and TCB. Finally, one component should be further analyzed since it may contain an EPA List 2 inert.

[g] These data do not fully satisfy the requirements of 40 CFR §158.175 (Guideline Reference No. 62-2) concerning certified limits because the upper certified limits proposed for the impurities do not reflect the results of the preliminary analysis; the registrant must explain the basis for the determination of the certified limits.

[h] These data do not fully satisfy the requirements of 40 CFR §158.180 (Guideline Reference No. 62-3) concerning enforcement analytical methods because the registrant must provide an enforcement method for the impurities TCAB, TCAOB, or TCB. We note that the HRGC/MS method used for preliminary analysis may not be suitable as an enforcement method, even if adequate validation data are submitted, because it requires the use of materials that are not readily available. Subdivision D of the Pesticide Assessment Guidelines requires that an enforcement analytical method be as simple, quick, and inexpensive to perform as possible. Finally, if several organic impurities which were listed as nondetectable in preliminary analysis are to be included on the CSF, adequately validated enforcement methods to determine these impurities must be submitted.

Case No. 0047
Chemical No. 035506

Case Name: Linuron
Registrant: E. I. du Pont de Nemours and Company, Inc.
Product(s): 92% T (EPA Reg. No. 352-326) produced by I.Pi.Ci.

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	N [c]	**00162140** CSF dated 6/18/92
61-2	Beginning Materials and Manufacturing Process	Y	**00162140**
61-3	Discussion of Formation of Impurities	Y	**00162140**
62-1	Preliminary Analysis	Y	**00162140** 40484501 [d] 41817201 [e] 42347701 42347702 42347703
62-2	Certification of Ingredient Limits	Y [f]	CSF dated 6/18/92 42493101 [g]
62-3	Analytical Methods to Verify the Certified Limits	Y	**00162140**
63-2	Color	Y	**00162140**
63-3	Physical State	Y	**00162140**
63-4	Odor	Y	**00162140**
63-5	Melting Point	Y	**00162140**
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	Y	**00162140**
63-8	Solubility	Y	**00162140**
63-9	Vapor Pressure	Y	**00162140**
63-10	Dissociation Constant	Y	**00162140**
63-11	Octanol/Water Partition Coefficient	Y	**00162140**
63-12	pH	Y	**00162140**
63-13	Stability	Y	**00162140**
63-14	Oxidizing or Reducing Action	Y	**00162140**
63-15	Flammability	N/A	
63-16	Explodability	Y	**00162140**
63-17	Storage Stability	Y	**00162140**
63-18	Viscosity	N/A	
63-19	Miscibility	N/A	
63-20	Corrosion Characteristics	Y	**00162140**

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

[b] **Bolded** citations were reviewed under CBRS No. 1318, dated 10/28/86, by J. Garbus in connection with data review for Aceto Corp.; underlined citations were reviewed under

CBRS Nos. 10034 and 10138, D179497 and D179989, dated 8/25/92 by R. Perfetti; remaining citations were reviewed as noted.

[c] These data do not fully satisfy the requirements of 40 CFR §158.155 (Guideline Reference No. 61-1) concerning product identity because the registrant must submit the nominal concentrations of the active ingredient and impurities. In addition, we note that one impurity present at ≤0.1% is pesticidally active.

[d] CBRS No. 3351, dated 1/13/89, by M. Flood.

[e] CBRS No. 7799, D163010, dated 7/24/91, by S. Funk.

[f] Certified limits must be submitted on EPA Form 8570-4 (Rev. 12/90), including an upper certified limit for 2,3,7,8-TCDF, which was previously listed on the CSF.

[g] CBRS No. 11363, D187969, dated 6/29/93, by D. McNeilly.

Case No. 0047
Chemical No. 035506

Case Name: Linuron
Registrant: Griffin Corporation
Product(s): 95% T (EPA Reg. No. 31812-270) produced by Agan.

Du Pont has submitted an agreement that data submitted for the du Pont alternate linuron formulation produced by Agan may be used to support the Griffin linuron formulation produced by Agan. Therefore, the data requirements outlined in the Product Chemistry Data Summary table for the du Pont 95% T produced by Agan also apply to the Griffin 95% T produced by Agan. Griffin must submit its own Confidential Statement of Formula including information concerning the registrant, registration number, producer, components by chemical name and their purposes, nominal concentrations, and certified limits.

Case No. 0047
Chemical No. 035506

Case Name: Linuron
Registrant: Drexel Chemical Company
Product(s): 95% Ts (EPA Reg. Nos. 19713-158, 19713-367, and 19713-368) produced by "undetermined" sources.

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	
63-14	Oxidizing or Reducing Action	N	
63-15	Flammability	N	
63-16	Explodability	N	
63-17	Storage Stability	N	
63-18	Viscosity	N	
63-19	Miscibility	N	
63-20	Corrosion Characteristics	N	

[a] Y = Yes; N = No; N/A = Not Applicable. Until the sources of the Drexel linuron technical products are identified, CBRS cannot summarize the supporting database.

DYNAMAC
CORPORATION
Environmental Services

Final Report

LINURON
Shaughnessy No. 035506; Case No. 0047 (CBRS No. 12392; DP Barcode D194477)

TASK 2B
Reregistration Eligibility Document: Residue Chemistry Considerations

December 9, 1993

Contract No. 68-D2-0053

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

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

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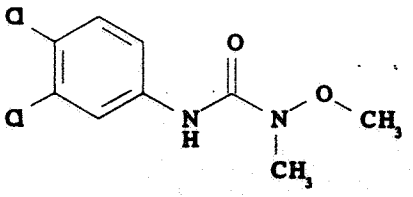
LINURON



REREGISTRATION ELIGIBILITY DOCUMENT

RESIDUE CHEMISTRY CONSIDERATIONS

PC Code: 035506; Case 0047

(CBRS No. 12392; DP Barcode D194477)

TASK 2B

INTRODUCTION

Linuron [3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea] is a substituted urea herbicide registered for use on asparagus, carrots, celery, corn (field and sweet), cottonseed (DuPont has voluntarily dropped use), parsley, parsnips, potatoes, sorghum, soybeans, and wheat (winter). Linuron may be applied preplant, preemergence, postemergence, or post-transplant using ground or aerial equipment. The registered modes of application are band treatment, directed spray, or broadcast spray. Linuron is a restricted use pesticide and may be applied only by certified applicators or personnel under their direct supervision. (*Source: LUIS General Chemical Report for Linuron, 5/20/92*).

Tolerances for residues of linuron in/on plant and animal commodities are expressed in terms of linuron *per se* [40 CFR §180.184(a) and (b)]. No food/feed additive tolerances have been established for linuron residues. The established tolerances listed in 40 CFR §180.184 range from 0.25 ppm to 3 ppm. The HED Metabolism Committee has concluded that the residues of concern are linuron and its metabolites convertible to 3,4-dichloroaniline, expressed as linuron (D. McNeilly, 11/17/93); residues of 3,4-dichloroaniline *per se* need not be regulated separately. Adequate enforcement methods are available for the determination of linuron residues of concern in/on plant and animal tissues. The current enforcement methods determine linuron and all metabolites hydrolyzable to 3,4-dichloroaniline.

Linuron was the subject of a Reregistration Standard Guidance Document dated 6/84 and a Product and Residue Chemistry Reregistration Standard Update dated 6/20/90. The Agency initiated a Special Review in 1984 because linuron exceeded the oncogenicity risk criteria; the Agency was concerned about applicator exposure and

dermal penetration. The Special Review effort ceased in 1988, and in the Federal Register, (6/29/90) the Agency revised the toxicological classification of linuron from a quantifiable Group C carginogen to an unquantifiable Group C carcinogen. The information contained in this document outlines the Residue Chemistry Science Assessments with respect to the reregistration of linuron.

SUMMARY OF SCIENCE FINDINGS

GLN 171-3: Directions for Use: A REFS search conducted 9/14/93 indicated that there are 15 linuron end-use product (EPs) with food/feed uses which are registered to E.I. du Pont de Nemours and Company, Griffin Corporation, Drexel Chemical Company, Platte Chemical Company, and Micro-Flo Company. These linuron EPs are listed in Table A.

Table A. Currently registered linuron end-use products.

Registrant EPA Reg. No.	Acceptance Date	Formulation Class	Product Name
E.I. du Pont de Nemours and Company			
352-270	1/13/93	50% WP	Lorox® Herbicide
352-394	3/15/93	50% DF	Lorox® DF Herbicide
352-562 (including SLN Nos. CA820042 and TX820021)	3/15/93	50% DF	Lorox® SP Herbicide
352-544	2/4/93	55.4% DF	Gemini® Herbicide
352-543	3/15/93	56.9% DF	Lorox Plus® Herbicide
352-391	1/13/93	4 lb/gal FlC	Lorox® L Herbicide
Griffin Corporation			
1812-320	5/5/93	50% DF	Linex® 50DF
1812-245	4/28/93	4 lb/gal FlC	Linex® 4L
Drexel Chemical Company			
19713-79	6/30/92	30.8% WP	Atrazine Plus Linuron WP
19713-251	10/7/91	50% DF	Linuron DF Herbicide
19713-97	10/7/91	4 lb/gal FlC	Linuron 4L
Platte Chemical Company			
34704-703	2/6/91	4 lb/gal FlC	Linuron 4L Herbicide
Micro-Flo Company			
51036-78	7/24/86	4 lb/gal FlC	Linuron 4L Weed Killer

A comprehensive summary of the registered use patterns of linuron, based on these product labels, is presented in Table B. A tabular summary of the residue chemistry science assessments for reregistration of linuron is presented in Table C. The

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conclusions regarding the reregistration eligibility of linuron on the crops listed in Table C are based on the use patterns registered by the basic producers, E.I. du Pont de Nemours and Company, Griffin Corporation, and Drexel Chemical Company. When end-use product DCIs are developed (e.g., at the 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. An Agency memorandum (CBRS Nos. 6663 and 6994, 3/26/91, R. Perfetti) required label amendments for products with uses on carrots, celery, cotton, and potatoes; we note that all registrants have modified applicable labels appropriately.

GLN 171-4 (a): Plant Metabolism: The qualitative nature of the residue in plants is adequately understood (D. McNeilly, 11/17/93). Metabolism studies with corn, soybeans, and potatoes indicate that linuron is absorbed from the soil and translocated (i.e., systemic). The metabolic pathway involves demethylation to 3-(3,4-dichlorophenyl)-1-methoxyurea which is further metabolized to 3,4-dichloroaniline; metabolism may also occur through demethoxylation of linuron. The terminal residues of concern are the parent and its metabolites which are convertible to 3,4-dichloroaniline. (MRIDs 00018173, 00018176, 00027624, 00164195, 00164196, 40084801, 41716101, 41716102, 41938101, 42542101, and 42548401).

GLN 171-4 (b): Animal Metabolism: The qualitative nature of the residue in ruminants and poultry is adequately understood (D. McNeilly, 11/17/93). An acceptable metabolism study with goats indicates that linuron is rapidly metabolized by demethylation, demethoxylation, and hydroxylation and is primarily eliminated by excretion. The metabolism of linuron in poultry has been found to be consistent with the goat study. The terminal residues of concern are the parent and its metabolites which are convertible to 3,4-dichloroaniline. (MRIDs 00029932 and 42635401).

GLN 171-4 (c/d): Residue Analytical Methods - Plants/Animals: Adequate enforcement methods are available for the determination of linuron in plant and animal commodities. The Pesticide Analytical Manual (PAM) Vol. II lists a colorimetric method (Method I, Bleidner et. al.) and a paper chromatographic method (Method II). Residues of diuron may interfere in Method I. A modified version of Method I (H. L. Pease, *Journal of Agric. and Food Chem.*, 1962, Vol. 10, p. 279), which includes a cellulose column step to separate linuron from diuron, is currently the preferred method for the enforcement of tolerances. Both these methods determine linuron and all metabolites hydrolyzable to 3,4-dichloroaniline and have limits of detection of 0.05 ppm. A GLC/ECD method for linuron residues in/on asparagus from the CA Department of Food and Agriculture has been validated by the Agency and sent to FDA to be published in PAM Vol. II as Method III. This method determines residues of linuron *per se* and the limit of detection is 0.05 ppm. We note however that this method is inadequate for tolerance enforcement since it does not determine all the residues of concern. In addition, this method uses benzene as the extraction solvent. (MRIDs 00018087, 00018089, 00018127, and 00018176).

The FDA Pestrak Database (PAM Vol. I) contains data concerning the applicability of multiresidue methods D and E (fatty and nonfatty foods) for recovery of linuron and its metabolites 3-(3,4-dichlorophenyl)-1-methoxyurea, 3-(3,4-dichlorophenyl)-1-methylurea, 3,4-dichlorophenyl urea and 3,4-dichloroaniline. Linuron is partially recovered using Multiresidue Method E (fatty and nonfatty foods); recovery using Method D is variable. Linuron metabolites 3-(3,4-dichlorophenyl)-1-methoxyurea, 3-(3,4-dichlorophenyl)-1-methylurea, and 3,4-dichlorophenyl urea are not recovered using Method E (fatty and nonfatty foods); 3-(3,4-dichlorophenyl)-1-methylurea is recovered using Method D but 3-(3,4-dichlorophenyl)-1-methoxyurea is not likely to be recovered using this method. Linuron metabolite 3,4-dichloroaniline is not recovered using Method E (nonfatty foods) and has variable recovery using Method D.

GLN 171-4 (e): Storage Stability: Residues of linuron in/on soybeans, sugar beet tops, wheat, and asparagus have been shown to be stable for up to two years of storage at -20 C.

Storage stability data for the following commodities remain outstanding: carrots (raw and cooked; 19 months); field corn processed commodities (12 months); potatoes, and cooked and processed potato commodities (20 months); sorghum and sorghum processed commodities (12 months); and soybean processed commodities (6 months). Additional storage stability data are required to support outstanding field residue and processing studies.

Since residues have been shown to be stable in several matrices, the additional required storage stability data are considered confirmatory.

(MRIDs 00159802, 41716103, 42836701, and 42836702).

GLN 171-4 (k): Magnitude of the Residue in Plants: All data for magnitude of the residue in parsley, parsnips, potatoes, and sorghum grain have been evaluated and deemed adequate to reassess tolerances for these commodities.

Field residue data remain outstanding for the following crops: asparagus; carrots; corn, field, grain; corn, field, forage and fodder; corn, sweet (K + CWHR); corn, sweet, forage; sorghum forage and fodder; soybeans; wheat, grain; and wheat forage and straw. (MRIDs 00018067, 00018076, 00018087, 00018089, 00018148, 00018171, 00018172, 00018175, 00018206, 00018375, 00018382, 00018443, 00018450, 00027635, 00163267, 40210901, 40537601, 41189801, 41377601, 41452601, 41452701, 41501501, 41503401, 41569901, and 42605901).

Sufficient data to reassess tolerances for these commodities are not available at this time. Although sufficient field trial data are not available to reassess tolerances for all crops, sufficient data are available to do a reliable exposure assessment.

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Two additional field residue studies on corn (1990; MRID 41510501) and soybeans (1990; MRID 41591801) have been submitted. However, data from these submissions were not evaluated because they were generated by Craven Laboratories. Replacement data are currently being prepared for submission.

GLN 171-4 (l): Processed Food/Feed: All data for magnitude of the residue in processed food/feed have been evaluated and deemed adequate except that a full processing study is required for cottonseed (R. Perfetti, 3/26/91) and additional data are required to upgrade an existing potato processing study (S. Knizner, 9/2/92). DuPont in a letter to the Agency (Marie Chubb, 7/23/91) stated that they are cancelling linuron use on cotton. Apparantly no other registrants have come forward to support this use, therefore, CBRS recommends that the registered use on cotton be cancelled. In this case, the cottonseed processing study will no longer be required.

Outstanding potato processing data are considered confirmatory; sufficient data are available to reassess tolerances and estimate dietary exposure for potato processed products. Food additive tolerances must be proposed for potato chips and granules, and feed additive tolerances must be proposed for wet and dry peel waste.

NOTE: Linuron is assessed as a c-nonquantifiable oncogen, therefore Delany issues are involved. (MRIDs 00018206, 40049201, 41241202, 42397201, 42462901, 42542102, and 42560001).

GLN 171-4 (j): Magnitude of the Residue in Meat, Milk, Poultry and Eggs: All data for magnitude of the residues in meat, milk, poultry, and eggs have been evaluated and deemed adequate. No tolerances are required for poultry and eggs. (MRIDs 00018209, 00018210, 00018375, 00018383, 00018450, 00018775, and 00029932).

Recently the Agency received interim data from DuPont indicating that residues levels of linuron in or on corn fodder exceeded the 1 ppm tolerance. Preliminary data from field trials on corn indicate a tolerance of 6 ppm will be required to cover residues resulting from current registered uses. These data were submitted to the Agency under 6(A) (2) of FIFRA.
Since corn fodder is a major feed item for ruminants throughout the U.S. a revision to the previously estimated dietary burden to ruminants is required. The Residue Chemistry Chapter (6/29/82) to the Linuron Registration Standard previously estimated a "maximum plausible dietary load of 1.4 ppm." This estimate utilized the establish tolerance of 1.0 ppm in or on corn fodder. However, assuming residues are present at levels ca 6 ppm, the level at which tolerances may be required considering the currently available 6 (a)(2) data, a hypothetical diet based on feeding 50% corn grain and 50% corn fodder would result in a dietary burden of ca. 3.1 ppm.

Based on available ruminant feeding studies CBRS concludes that established tolerances for meat and milk are adequate to cover the increased dietary burden of 3.1 ppm. It should be noted however that the estimated residue level in ruminant liver (0.81 ppm) and kindey (0.81 ppm) are approaching the established tolerances of 1.0 ppm. Should the currently estimated ruminant dietary burden of 3.1 ppm be increased, established linuron tolerances for ruminant liver and kidney will need to be reassessed.

A final determination concerning the adequacy of meat and milk tolerances cannot be made until all the replacement corn data are submitted.

GLNs 165-1 and 165-2: Confined/Field Rotational Crops: All data for nature of the residue in confined rotational crops have been evaluated and deemed adequate. The requirement for field rotational crop studies has been waived. (MRIDs 40104101 and 40730101). The following are rotational crop restrictions:

> If initial seeding fails to produce a stand, crops registered for the rate of "Lorox" that has been applied may be planted into the treated area.
>
> Unless otherwise directed, any crop may be planted after 4 months except for cereals where only barley, oats, rye, and wheat may be planted.

GLN 171-5: Reduction of Residues: All data for reduction of residues have been evaluated and deemed adequate except that additional information is required to upgrade existing potato and carrot cooking studies. (MRIDs 41241201, 42379901, 42397201, 42462901, and 42462902).

> The asparagus cooking study shows washing with water reduces residues by 40%. Boiling removes an additional 25% of the residues, while steaming had little or no effect on reducing residue levels in or on asparagus (Ref: D. McNeilly, 3/18/93).
>
> A carrot cooking study was reviewed (C. Olinger, 10/31/89) and found to be unacceptable due to residues below the limit of quantitation. However, the study does indicate that cooking in boiling water does reduce overall residues.
>
> The potato cooking study shows that linuron residues concentrate in or on oven baked potatoes (1.5X) and microwave baked potatoes (1.6X), but are reduced in or on boiled potatoes (0.48X) (S. Knizner, 9/2/92).

Table B. Parameters of linuron food/feed use patterns registered to E.I. du Pont de Nemours and Company, Griffin Corporation, Drexel Chemical Company, Platte Chemical Company, and Micro-Flo Company.[1]

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Asparagus	50% WP	352-270	2.0	2.0	--	Use limited to CA, MI, MN, NC, OR, and WA for a single preemergence application and up to two postemergence applications to direct seeded or newly planted crowns using ground equipment.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703				
	50% WP	352-270	4.0	4.0	1	Use limited to CA, MI, MN, NC, OR, and WA for a single preemergence application (2.0 lb ai/A) and up to four postemergence applications to established beds, and a single postemergence directed spray application to the fern stage of asparagus using ground equipment. A one year plant-back interval has been established for any other crop if more than 2.0 lb ai/A/season is applied.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703				

(continued; footnotes follow)

Table B *(continued)*.

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Carrots	50% WP	352-270	1.5	2.0	14	Use limited to FL (maximum of 1.0 lb ai/A for du Pont and Drexel products) and MI, OH, and WI for a single preemergence application using ground equipment. Multiple foliar applications for use in the entire U.S. using ground equipment. Postemergence applications are to be made after carrots reach 3 inches in height. A maximum seasonal application rate of 1.5 lb ai/A has been established for areas west of the Rocky Mountains. No PHI has been established for EPA Reg. No. 51036-78.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				
	50% DF	CA820042	1.0	1.5	0	Use limited to CA for a single preemergence application using ground equipment.
	50% DF	1812-320	0.25	--	--	Use limited to NY for multiple broadcast applications made postemergence using ground equipment.
	4 lb/gal FlC	1812-245				
Celery	50% WP	352-270	1.5	1.5	--	Use limited to east of the Rocky Mountains for a single foliar post-transplant application using ground equipment. Application is to be made before celery reaches 8 inches in height. A 4-month plant-back interval has been established for crops other than celery and carrots. No PHI has been established due to the post-transplant nature of the application.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				

(continued; footnotes follow)

Table B *(continued)*.

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Corn, field	30.8% WP	19713-79	1.54	1.54	--	A single broadcast or band application made postplant, preemergence, or postemergence using ground equipment. Postemergence application is to be made before corn reaches 12 inches in height. A 6-month plant-back interval for crops other than corn has been established. Rotating crops to sugar beets, tobacco, or other vegetables following treated corn crop is prohibited.
	50% WP	352-270	1.5	3.0	--	Tank mix use limited to east of the Rocky Mountains for a single preemergence application using ground equipment. In addition, a single postemergence directed spray application to field corn at least 15 inches in height may be made using ground equipment. No PHI has been established.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				
Corn, sweet	50% WP	352-270	1.5	1.5	--	A single postemergence directed spray application to sweet corn at least 15 inches in height using ground equipment. No PHI has been established.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				

(continued; footnotes follow)

Table B *(continued)*.

Site[1]	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Cottonseed	50% DF	1812-320 19713-251	1.5	1.5	--	Use limited to east of the Rocky Mountains for one or two postemergence directed spray applications (0.75 lb ai/A) made after cotton is at least 8 inches tall or a single postemergence directed spray application made after the last cultivation (layby) when cotton is 20 inches tall using ground equipment. Feeding forage or gin trash from treated areas to livestock and grazing treated fields are prohibited.
	4 lb/gal FlC	1812-245 19713-97 34704-703 51036-78				
Parsley	50% DF	TX920021	1.5	1.5	--	Use limited to TX (TX920021) for a single preemergence broadcast soil application using ground equipment.
Parsnips	50% WP	352-270	1.5	1.5	--	A single preemergence broadcast or band application using ground equipment.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				
Potatoes	50% WP	352-270	2.0	2.0	--	Use limited to east of the Rocky Mountains for a single preemergence application after final "drag off" or "hilling" using ground equipment. In the Northeast, application may be made alone or as a tank mix with other herbicides. In WI (central sands area) a single preemergence application at 1.0 lb ai/A made be made after "drag off" or "hilling" using ground equipment.
	50% DF	352-394 352-562				
	4 lb/gal FlC	352-391 51036-78				

(continued; footnotes follow)

Table B *(continued)*.

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Potatoes, continued	50% DF	1812-320 19713-251	2.0	2.0	--	Use limited to east of the Rocky Mountains for a single preemergence application after "drag off" or "hilling" using ground or aerial equipment. Application must be made in a minimum of 3 gal/A when using aerial equipment. In the Northeast, application may be made alone or as a tank mix with other herbicides. In WI (central sands area) a single preemergence application at 1.0 lb ai/A made be made after "drag off" or "hilling" using ground or aerial equipment.
	4 lb/gal FlC	1812-245 19713-97 34704-703				
Sorghum	50% WP	352-270	1.0	2.0	90 PGI[3]	Tank mix use limited for a single preemergence application using ground equipment. In addition, a single postemergence directed spray application to sorghum at least 12 inches in height may be made using ground equipment. Rotating crops to fall crops, sugar beets, tobacco, potatoes, or other vegetables following treated sorghum crop is prohibited for EPA Reg. Nos. 1812-245, 1812-320, and 51036-78.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				
	50% DF	19713-251	1.5	1.5	--	Use limited to Great Plains as a tank mix use for a single preemergence application using ground equipment. A 4-month plant-back interval for crops other than sorghum or field corn has been established. Grazing or feeding forage or silage from treated fields to dairy animals is prohibited.
	4 lb/gal FlC	19713-97 51036-78				

(continued; footnotes follow)

Table B *(continued)*.

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Soybeans	50% WP	352-270	1.5-3.0	2.5-4.0	60	A single preemergence application using ground or aerial (Griffin and Micro-Flo formulations only) equipment for conventional, minimum, or no-tillage systems. Application must be made in a minimum of 2-3 gal/A when using aerial equipment. The lower application rates are to be used for conventional tillage systems and higher application rates for minimum or no-tillage systems. Application may be made alone or as a tank mix with other herbicides. In addition, a maximum of two postemergence directed spray applications at 0.5 lb ai/A to soybeans a least 8 inches in height using ground equipment with a 7-day retreatment interval for conventional, minimum, or no-tillage systems. Feeding of treated forage or hay to livestock is prohibited. A 4-month plant-back interval for crops other than soybeans has been established.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 34704-703 51036-78				
	55.4% DF	352-544	0.83	0.83	--	A single early preplant, preplant incorporated, or preemergence application using ground equipment for conventional, minimum, or no-tillage systems. Application may be made alone or as a tank mix with other herbicides. Plant-back intervals for rotational crops other than soybeans are determined by geographical location, soil pH, application rate, and posttreatment interval. The grazing of treated fields or harvesting of forage or hay for livestock is prohibited.
	56.9% DF	352-543	0.64	0.64		

(continued; footnotes follow)

Table B *(continued)*.

Site	Formulation	EPA Reg. No.	Maximum Single Application Rate (lb ai/A)	Maximum Seasonal Rate (lb ai/A)	PHI[2] (Days)	Use Limitation
Wheat, winter (drill planted)	50% WP	352-270	0.75	0.75	--	Use limited to ID, OR, and WA for a single preemergence, early postemergence, or semi-dormant application made in the fall or winter using ground equipment. Application may be made alone or as a tank mix with other herbicides. Grazing or feeding immature plants to livestock is prohibited. A 5-6 month plant-back interval for any rotational crop has been established.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 51036-78				
	50% WP	352-270	0.63	0.63	--	Use limited to ID, OR, and WA (east of the Cascades) for a single postemergence broadcast application made in the spring using ground equipment. Application may be made alone or as a tank mix with other herbicides. Grazing or feeding immature plants to livestock is prohibited. A 5-6 month plant-back interval for any rotational crop has been established.
	50% DF	352-394 352-562 1812-320 19713-251				
	4 lb/gal FlC	352-391 1812-245 19713-97 51036-78				
	4 lb/gal FlC	1812-245 51036-78	1.75	1.75	--	Use limited to ID, OR, and WA (west of the Cascades) for a single preemergence application using ground equipment. Grazing or feeding immature plants to livestock is prohibited. A 5-6 month plant-back interval for any rotational crop has been established.

[1] The following general rotational crop restrictions have been established: (i) unless otherwise stated, any crop may be planted after 4 months (EPA Reg. No. 51036-78); (ii) unless otherwise stated, any crop may be planted after 4 months except for cereals where only barley, oats, rye and wheat may be planted; West of the Rocky Mountains, carrots or celery may be planted after 4 months and no other crop may be planted within one year (EPA Reg. Nos. 352-270, 352-394, 352-562, 1812-245, 1812-320, 19713-251, and 34704-703); (iii) West of the Rocky Mountains, carrots or celery may be planted after 4 months and no other crop may be planted within one year (EPA Reg. No. 19713-97).

[2] PHI = preharvest interval.

[3] PGI = pregrazing interval.

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Table C. Residue chemistry science assessments for reregistration of linuron.

GLN: Data Requirements	Tolerance, ppm [40 CFR]	Must Additional Data Be Submitted?	References[1]
171-4 (a): Plant Metabolism		No	00018173, 00027624, 00018176, **00164195** **00164196**, 40084801[2] 41716101[3], 41716102[3] 41938101[4],42542101[5] 42548401[6]
171-4 (b): Animal Metabolism		No	00029932, 42635401[7]
171-4 (c/d): Residue Analytical Methods		No	00018087, 00018089, 00018127, 00018176
171-4 (e): Storage Stability		Yes[8]	00159802,[9] 41716103,[3] 42836701[10], 42836702[10]
171-4 (k): Magnitude of the Residue in Plants			
Root and Tuber Vegetable Group			
- Carrots	1 [180.184(a)]	Yes[11]	00018172, 00027635, 00163267,[12] 40210901,[13] **40537601**, 41503401[14]
- Parsnips	0.5 [180.184(a)]	No[15]	00018171
- Parsnips, tops	0.5 [180.184(a)]	No[16]	
- Potatoes	1 [180.184(a)]	No	00027635, 00163267,[12] 40210901,[13] 41452701[14]
Leafy Vegetables Group			
- Celery	0.5 [180.184(a)]	No[17]	00018443, **40537601**, 41501501[14]
- Parsley	0.25 [180.184(b)]	No	41189801[18]
Legume Vegetables Group			
- Soybeans	1 [180.184(a)]	Yes[19]	00018076, 00018206, 00027635, 00163267,[12] 40210901[13]
Foliage of Legume Vegetables Group			
- Soybean forage and hay	1 [180.184(a)]	No[20]	00018076, 00018206, 00027635

(continued; footnotes follow)

Table C *(continued)*.

GLN: Data Requirements	Tolerance, ppm [40 CFR]	Must Additional Data Be Submitted?	References[1]
Cereal Grains Group			
- Barley, grain	0.25 [180.184(a)]	No[21]	
- Corn, field, grain	0.25 [180.184(a)]	Yes[22]	00018171, 00018206, 00018375, 00018382, 00018450, 00163267,[12] 40210901,[13] **40537601**
- Corn, pop, grain	0.25 [180.184(a)]	No[23]	
- Corn, sweet (K + CWHR)	0.25 [180.184(a)]	Yes[24]	00018171, 00018206, 00018375, 00018382, 00018450
- Sorghum, grain	0.25 [180.184(a)]	No	00018171, 00018148, **40537601, 41377601**
- Wheat, grain	0.25 [180.184(a)]	No[25]	00018171, 0001817**540537601**, 42605901[28]
- Oats, grain	0.25 [180.184(a)]	No[26]	
- Rye, grain	0.25 [180.184(a)]	No[27]	
Forage, Fodder, and Straw of Cereal Grains Group			
- Barley, forage, hay and straw	1 [180.184(a)]	No[29]	
- Corn, field, forage and fodder	1 [180.184(a)]	Yes[30]	00018171, 00018206, 00018375, 00018382, 00018450, 00163267,[12] 40210901,[13] **40537601**
- Corn, pop, forage and fodder	1 [180.184(a)]	No[20]	
- Corn, sweet, fodder	1 [180.184(a)]	No[31]	
- Corn, sweet, forage	1 [180.184(a)]	Yes[32]	00018171, 00018206, 00018375, 00018382, 00018450
- Oats, forage, hay and straw	1 [180.184(a)]	No[33]	
- Rye, forage, hay and straw	1 [180.184(a)]	No[34]	
- Sorghum forage and fodder	1 [180.184(a)]	Yes[35]	00018171, 00018148, **40537601**

(continued; footnotes follow)

Table C *(continued)*.

GLN: Data Requirements	Tolerance, ppm [40 CFR]	Must Additional Data Be Submitted?	References[1]
- Wheat forage and straw	0.5 [180.184(a)]	Yes[36]	00018171, 40537601, 42605901[23]
- Wheat, hay	0.5 [180.184(a)]	No[37]	
Miscellaneous Commodities			
- Asparagus	3 [180.184(a)]	Yes[38]	00018087, 00018089, 00163267,[12] 40210901,[13] 41452601[14]
- Cotton, seed	0.25 [180.184(a)]	No[39]	00018067, 41569901[14]
171-4 (l): Magnitude of the Residue in Processed Food/Feed			
- Corn, field	--	No	42560001[40]
- Cotton, seed	--	Yes[41]	
- Potatoes	--	Yes[42]	40049201,[43] 42397201[44]
- Sorghum, grain	--	No	42542102[5]
- Soybeans	--	No	00018206, 41241202,[45] 42462901[46]
- Wheat, grain	--	No[47]	
171-4 (j): Magnitude of the Residue in Meat, Milk, Poultry, and Eggs			
- Cattle	1 (fat, meat, and meat byproducts) [180.184(a)]	No	00018209, 00018210, 00018375, 00018450, 00018775
- Goats	1 (fat, meat, and meat byproducts) [180.184(a)]		00029932
- Hogs	1 (fat, meat, and meat byproducts) [180.184(a)]		
- Horses	1 (fat, meat, and meat byproducts) [180.184(a)]		

(continued; footnotes follow)

Table C *(continued)*.

GLN: Data Requirements	Tolerance, ppm [40 CFR]	Must Additional Data Be Submitted?	References[1]
- Sheep	1 (fat, meat, and meat byproducts) [180.184(a)]		
- Poultry and Eggs	--		00018383
171-4 (f): Magnitude of the Residue in Potable Water		N/A	
171-4 (g): Magnitude of the Residue in Fish		N/A	
171-4 (h): Magnitude of the Residue in Irrigated Crops		N/A	
171-4 (i): Magnitude of the Residue in Food Handling Establishments		N/A	
171-5: Reduction of Residues		Yes[48]	41241201,[33, 33] 42397201,[32] 42379901,[49] 42462901,[34] 42462902[34]
165-1: Rotational Crops (Confined)		No	40104101, 40730101
165-2: Rotational Crops (Field)		No[50]	

1. Bolded reference(s) were reviewed in the Update of 6/20/90. Unbolded references were reviewed in the Residue Chemistry Science Chapter of the Registration Standard dated 6/30/82. All other references were reviewed as noted.
2. CBRS No. 2838, 12/24/87, L. Propst; review of corn metabolism data.
3. CBRS No. 7523, DP Barcode D160079, 4/25/91, R. Perfetti.
4. CBRS No. 8391, DP Barcode D167107, 5/21/92, P. Deschamp.
5. CBRS No. 11358, DP Barcode D187993, 11/18/93, D. McNeilly; review of potato metabolism data.
6. CBRS No. 11359, DP Barcode D187998, 11/18/93, D. McNeilly; review of soybean metabolism data.
7. CBRS No. 11361, DP Barcode D188002, 11/18/93, D. McNeilly; review of poultry metabolism data.
8. Additional storage stability data are required to support outstanding field residue and processing studies (see page 4).
9. CBRS No. 1244, 8/12/85, J. Garbus.

(continued; footnotes follow)

Table C *(continued)*.

10. CBRS No. 12553, DP Barcode D195090, 10/5/93, D. McNeilly.

11. Griffin and Drexel must submit data reflecting application of the 4 lb/gal FlC formulation at the maximum registered rate (Reference 14). E.I. du Pont de Nemours Inc. must submit revised product labels, establishing a 14-day PHI.

12. CBRS No. 1317, 10/29/86, J. Garbus.

13. CBRS No. 2333, 6/2/87, J. Garbus.

14. CBRS Nos. 6663 and 6994, 3/26/91, R. Perfetti.

15. Data requirements pertaining to the use of a DF or FlC formulation on parsnips have been waived (4/25/90, E. Zager). Residue data for field trials conducted from 1986 to 1988 on asparagus, carrots, celery, corn, cotton, potatoes, sorghum, soybeans, and wheat indicate similar residue patterns regardless of formulation.

16. Parsnip tops are no longer considered as a separate raw agricultural commodity.

17. Registered use is only for East of the Rocky Mountains. End-Use labels should prohibit use of linuron West of the Rockies (R. Perfetti, 3/26/91).

18. CB No. 5658, 10/5/89, F. Griffith. Regional registration for all states east of the Mississippi river.

19. Craven data were submitted to support reregistration of linuron on soybeans. This data is being replaced (see R. Lascola, 9/9/91). Data reflecting postemergence application of the 50% DF or 4 lb/gal FlC formulation at the maximum registered rate remain outstanding.

20. Because restrictions against the feeding of treated soybean forage and hay exist on all pertinent product labels, no data are required and the established tolerances for soybean forage and hay should be revoked.

21. There are no registered uses of linuron on barley. Applicable tolerances should be revoked.

22. Craven data were generated to support the reregistration of linuron on corn. These data are being replaced. Data reflecting a single postemergence application of the 50% DF formulation at the maximum registered rate remain outstanding. In addition, data pertaining to linuron residues of concern in grain dust must be submitted (Reference 28).

23. There are no registered uses of linuron on pop corn. Applicable tolerances for commodities of popcorn should be revoked.

24. No data have been submitted in response to the Update. Data reflecting a single postemergence application of the 50% DF formulation at the maximum registered rate remain outstanding.

25. See D. McNeilly, 5/10/93.

26. There are no registered uses of linuron on oats. Applicable tolerances should be revoked.

Table C *(continued)*.

27. There are no registered uses of linuron on rye. Applicable tolerances should be revoked.

28. CBRS No. 11362, DP Barcode D188028, 5/10/93, D. McNeilly.

29. There are no registered uses of linuron on barley. Applicable tolerances should be revoked.

30. Craven data were generated to support the reregistration of linuron on corn. These data are being replaced. DuPont has recently submitted 6(a)(2) data (D. McNeilly, 12/15/93) from these replacement studies indicating residues will exceed the established tolerance. Data pertaining to residues in/on field corn forage and fodder following a single postemergence application of the 50% DF formulation at the maximum registered rate remain outstanding.

31. No longer considered a raw agricultural commodity.

32. No data have been submitted in response to the Update. Data pertaining to residues in/on sweet corn forage following a single postemergence application of the 50% DF formulation at the maximum registered rate remain outstanding.

33. There are no registered uses on oats. Applicable tolerances should be revoked.

34. There are no registered uses on rye. Applicable tolerances should be revoked.

35. No data have been submitted in response to the Update. Data pertaining to residues in/on sorghum forage and fodder following a single postemergence application of the 50% DF formulation at the maximum registered rate remain outstanding.

36. At the request of the Agency DuPont, has submitted a petition (PP#4F4293) to amend the use on wheat and increase linuron tolerances on wheat straw.

37. No longer considered a raw agricultural commodity.

38. Data reflecting application of the 4 lb/gal FlC formulation at the maximum registered rate remain outstanding. In addition, a higher tolerance for asparagus must be proposed (Reference 14).

39. A Federal Register Notice (3/4/92) was issued cancelling use of products 352-270, 352-391, and 352-394 on cotton (DuPont products).

40. CBRS No. 11360, DP Barcode D188001, 7/13/93, D. McNeilly.

41. No data have been submitted in response to the Update. Data depicting residues in cotton meal, hulls, soapstock, and crude and refined oil remain outstanding. DuPont in a letter to the Agency stated that they are cancelling linuron use on cotton (M. Chubb, 7/23/91). If these uses are cancelled (i.e., other registrant also cancel use on cotton), additional data for cottonseed commodities will not be required.

42. Additional information pertaining to sample storage, the processing protocol, and limit of quantitation determination, as well as an explanation for low method recoveries from potato chips, are required to

Table C *(continued)*.

upgrade the submitted potato processing study (CBRS No. 10368, DP Barcode D181454, 9/2/92, S. Knizner).

43. CBRS No. 2279, 6/2/87, J. Garbus.

44. CBRS No. 10368, DP Barcode D181454, 9/2/92, S. Knizner.

45. CBRS No. 5858, 10/31/89, C. Olinger.

46. CBRS No. 10586, DP Barcode D182595, 3/18/93, D. McNeilly.

47. The requirement for a wheat processing study has been waived (CBRS No. 11063, DP Barcode D185892, 1/15/93, R. Perfetti).

48. Additional information on sample storage, the cooking protocol, and the determination of limits of quantitation is required to upgrade the potato cooking study (Reference 32).

Additional information on the determination of limits of quantitation and an adequate description of the cooking procedure are required to upgrade the carrot cooking study (Reference 37).

49. CBRS No. 10370, DP Barcode D181455, 9/8/92, S. Knizner.

50. The requirements for field rotational crop studies have been waived based on the results of the Confined Rotational Crop (GLDN 165-1) study.

TOLERANCE REASSESSMENT SUMMARY

Tolerances Listed Under 40 CFR §180.184(a)

The tolerances listed under 40 CFR §180.184(a) for residues of linuron in/on plant and animal commodities are expressed in terms of residues of linuron *per se*. The tolerance expression under 40 CFR §180.184(a) should be revised as follows: "Tolerances are established for the combined residues of the herbicide linuron (3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea) and its metabolites convertible to 3,4-dichloroaniline, calculated as linuron, in or on the following raw agricultural commodities:". A summary of the reassessment of tolerances listed in 40 CFR §180.184(a) is presented in Table D.

Sufficient data are available to support the established tolerances for the following crops: celery; cottonseed; parsnips; potatoes; and sorghum, grain.

Additional residue data are required if all registered uses of linuron are to be covered under established tolerances for: asparagus; carrots; corn, field, grain; corn, field, forage and fodder; corn, sweet (K + CWHR); corn, sweet, forage; sorghum forage and fodder; soybeans; wheat, grain; and wheat forage and straw. In addition, grain dust data remain outstanding for field corn.

A processing study remains outstanding for cottonseed, if registrants other than DuPont decide to support this use.

Food additive tolerance proposals are required for "potatoes, granules" at 0.8 ppm and "potatoes, chips" at 0.6 ppm, and a feed additive tolerance proposal is required for "potatoes, waste from processing" at 10 ppm. However, Delaney issues may prevent the establishment of these tolerances.

The established tolerances for barley, oats, and rye forage, grain, hay, and straw should be revoked since there are no registered uses of linuron on these commodities. In addition, the established tolerances for sweet corn fodder, parsnips tops, and wheat hay should be revoked since these commodities are not listed in Table II as raw agricultural commodities of sweet corn, parsnips, and wheat, respectively. The established tolerances for soybean forage and hay should be revoked since restrictions against the feeding of these commodities exist on all pertinent linuron product labels.

Tolerances have been proposed for lettuce at 0.1 ppm (PP#1E02486), and ginger and taro at 1 ppm (PP#3E2920). Tolerance revisions have been proposed for potatoes at 0.2 ppm; the meat, fat, and mbyp (except kidney and liver) of cattle, goats, hogs, horses, and sheep at 0.1 ppm; and the liver and kidney of cattle, goats, hogs, horses, and sheep at 1.0 ppm (PP#0F3832).

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6(a)(2) data submission indicates linuron residues in or on corn fodder will need to be raised to cover residues up to 5.5 ppm in corn fodder. The current tolerance is 1 ppm.

Tolerances Listed Under 40 CFR §180.184(b)

The tolerance listed under 40 CFR §180.184(b) is with regional restriction and is expressed in terms of residues of linuron *per se*. The tolerance expression under 40 CFR §180.184(b) should be revised as follows: "Tolerances are established for the combined residues of the herbicide linuron (3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea) and its metabolites convertible to 3,4-dichloroaniline, calculated as linuron, in or on the following raw agricultural commodities:". A summary of the reassessment of tolerances listed in 40 CFR §180.184(b) is presented in Table D.

Sufficient data are available to support the established tolerance for parsley.

Dietary Exposure Estimate (Risk Assessment)

CBRS recommends that anticipated residue estimates provided to DRES in 1987 in connection with the Linuron Special Review be used to estimate dietary risk. Revised anticipated residues estimates are not being provided at this time because linuron is now classified as a nonquantifiable C carcinogen and less than 17% of the RfD is accounted for by current uses.

UNCERTAINTY

Because the metabolism of linuron in plant and animal is adequately understood the uncertainty in estimating residues is lessened. Additionally, available field trials, processing studies, reduction of the residue studies, and animal feeding studies provide sufficient information to estimate exposure and in some cases to evaluate appropriate tolerance levels. This also reduces the uncertainty in estimating exposure.

Field trial data are outstanding for soybeans and corn. Treatment of soybeans is a major linuron use. However, previous dietary exposure estimates conducted in connection with the Special Review indicate that linuron residues in these commodities will be low. Therefore, this source of uncertainty should not significantly affect the linuron risk estimate one way or the other.

Linuron storage stability data are considered confirmatory . Data currently available indicate that linuron residue are stable in frozen storage. Thus these data should not impact the exposure estimate/risk estimate.

Dietary exposure estimates based on residue data from field trial generally reflect a conservative estimate.

Table D. Tolerance Reassessment Summary.

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR 180.184(a):			
Asparagus	3	Increase to 7	See R. Perfetti, 3/36/91
Barley, forage	0.5	Revoke	No registered uses.
Barley, grain	0.25	Revoke	No registered uses.
Barley, hay	0.5	Revoke	No registered uses; not a RAC in Table II.
Barley, straw	0.5	Revoke	No registered uses.
Carrots	1	See comment	Tolerance is adequately supported by DuPont provided all labels specify a 14-day PHI. Other companies still need to provide data.
Cattle, fat	1	1	Proposed tolerance revision 0.1 ppm.
Cattle, mbyp	1	1 1	*Cattle, kidney* *Cattle, liver* *Cattle, mbyp (exc. liver and kidney)*/Proposed tolerance revision 0.1 ppm.
Cattle, meat	1	1	Proposed tolerance revision 0.1 ppm.
Celery	0.5	0.5	The available data support use west of the Rocky Mountains, all labels must reflect this restriction.
Corn, field, fodder	1		6(a)(2) data have been submitted by DuPont indicating a higher tolerance 6 ppm in/on fodder is required. This conclusion is tentative pending submission of the final data submission.
Corn, field, forage	1		
Corn, fresh (inc. sweet K + CWHR)	0.25		*Corn, sweet (K + CWHR)*
Corn, grain (inc. pop)	0.25		*Corn, field, grain* Pop corn grain tolerance should be deleted since there are no registered uses.

(continued)

Table D *(continued).*

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR 180.184(a):			
Corn, pop, fodder	1	Revoke	
Corn, pop, forage	1	Revoke	No registered uses.
Corn, sweet, fodder	1	Revoke	Not a RAC in Table II.
Corn, sweet, forage	1		
Cottonseed	0.25	0.25	*Cotton, seed*
Goats, fat	1	1	Proposed tolerance revision to 0.1 ppm.
Goats, mbyp	1	1 1	*Goats, kidney* *Goats, liver* *Goats, mbyp (exc. liver and kidney)*/Proposed tolerance revision to 0.1 ppm.
Goats, meat	1	1	Proposed tolerance revision to 0.1 ppm.
Hogs, fat	1	1	Proposed tolerance revision to 0.1 ppm.
Hogs, mbyp	1	1 1	*Hogs, kidney* *Hogs, liver* *Hogs, mbyp (exc. liver and kidney*/Proposed tolerance revision to 0.1 ppm.
Hogs, meat	1	1	Proposed tolerance revision to 0.1 ppm.
Horses, fat	1	1	Proposed tolerance revision to 0.1 ppm.
Horses, mbyp	1	1 1	*Horses, kidney* *Horses, liver* *Horses, mbyp (exc. liver and kidney*/Proposed tolerance revision to 0.1 ppm.
Horses, meat	1	1	Proposed tolerance revision to 0.1 ppm.
Oats, forage	0.5	Revoke	No registered uses.
Oats, grain	0.25	Revoke	No registered uses.
Oats, hay	0.5	Revoke	No registered uses; not a RAC in Table II.
Oats, straw	0.5	Revoke	No registered uses.

(continued)

Table D *(continued).*

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR 180.184(a):			
Parsnips (with or without tops)	0.5	0.5	*Parsnips, roots*
Parsnips, tops	0.5	Revoke	Not a RAC in Table II.
Potatoes	1	0.2"	Proposed revision to the established tolerance. " - All registrants must submit revised labels prohibiting use west of the Rocky Mountains.
Rye, forage	0.5	Revoke	No registered uses.
Rye, grain	0.25	Revoke	No registered uses.
Rye, hay	0.5	Revoke	No registered uses; not a RAC in Table II.
Rye, straw	0.5	Revoke	No registered uses.
Sheep, fat	1	1	Proposed tolerance revision to 0.1 ppm.
Sheep, mbyp	1	1 1	*Sheep, kidney* *Sheep, liver* *Sheep, mbyp (exc. liver and kidney)*/Proposed tolerance revision to 0.1 ppm.
Sheep, meat	1	1	Proposed tolerance revision to 0.1 ppm.
Sorghum, fodder	1		
Sorghum, forage	1		
Sorghum, grain (milo)	0.25	0.25	*Sorghum, grain*
Soybeans, (dry or succulent)	1		*Soybeans*
Soybeans, forage	1	Revoke	Feeding restrictions exist.
Soybeans, hay	1	Revoke	Feeding restrictions exist.
Wheat, forage	0.5		
Wheat, grain	0.25		
Wheat, hay	0.5	Revoke	Not a RAC in Table II.
Wheat, straw	0.5		Registrant is petitioning for amended use and increased tolerance (PP#4F4393).
Tolerances listed under 40 CFR 180.184(b):			
Parsley	0.25	0.25	

(continued)

Table D *(continued)*.

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR 180.184(a):			
Tolerances to be proposed under 40 CFR 185 and 186[1]			
Potatoes, chips	--	0.6	
Potatoes, granules	--	0.8	
Potatoes, waste from processing	--	10	

[1] Delaney issues may prevent the establishment of these tolerances.

CODEX HARMONIZATION

No Codex MRLs have been established for linuron; therefore, issues of compatibility between Codex MRLs and U.S. tolerances do not exist.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No.: 1244
Subject: Linuron: Reregistration and Special Review: Storage Stability Data. Accession No. 258681
From: J. Garbus
To: R. Taylor/J. Miller and I. Sunzenauer
Dated: 8/12/85
MRID(s): 00159802

CBRS No.: 1317
Subject: ID. No. 035506: Linuron: Reregistration and Special Review: Response to Data Call-In. Additional Residue Data for Soybeans, Corn, Carrots, Asparagus, and Potatoes. Access. No. 264383
From: J. Garbus
To: I. Sunzenauer and R. Taylor
Dated: 10/29/86
MRID(s): 00163267

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CBRS No.: 2279
Subject: ID. No. 0035506: Linuron: Reregistration and Special Review: Potato Processing Protocol.
From: J. Garbus
To: M. Boodee
Dated: 6/2/87
MRID(s): 40049201

CBRS No.: 2333
Subject: ID. No. 0035506: Linuron: Reregistration and Special Review: Response to Data Call-In. Additional Residue Data for Soybeans, Corn, Carrots, Asparagus, and Potatoes.
From: J. Garbus
To: M. Boodee
Dated: 6/2/87
MRID(s): 40210901

CBRS No.: 2838
Subject: Metabolism of ^{14}C-Linuron by Corn Plants. Data Requirement for the Linuron Registration Standard.
From: L. Propst
To: R. Taylor and M. Boodee and Toxicology Branch
Dated: 12/24/87
MRID(s): 40084801

CBTS No.: 5658
Subject: PP#6E3416 Linuron on Parsley. Evaluation of the July 10, 1989 Amendment. (MRID #411898-01 (HED Project #9-1934)
From: F. Griffith
To: H. Jamerson
Dated: 10/5/89
MRID(s): 41189801

CBRS No.: 5858
Subject: Review of Linuron Cooking Studies (Carrots, Asparagus, Potatoes) and Soybean Processing Studies, ID No. 035506; Record No. 253170
From: C. Olinger
To: R. Hundemann
Dated: 10/31/89
MRID(s): 41241201 and 41241202

CBRS No.: None
Subject: Linuron Reregistration: Data Waiver Request for Residues of Lorox® on Parsnips
From: E. Zager
To: L. Rossi
Dated: 4/25/90
MRID(s): None.

CBRS Nos.: 6663 and 6994
Subject: E.I. du Pont de Nemours and Co., Inc.: Response to the Linuron Reregistration Standard: Cropfield Trials
From: R. Perfetti
To: R. Engler and L. Rossi
Dated: 3/26/91
MRID(s): 41376601, 41452601, 41452701, 41569901, 41503401 and 41501501

CBRS No.: 7523; DP Barcode D160079
Subject: E.I. du Pont de Nemours and Co., Inc.: Response to the Linuron Reregistration Standard: Residue Chemistry
From: R. Perfetti
To: R. Engler and L. Rossi
Dated: 4/25/91
MRID(s): 41716101-41716103

CBRS No.: 8391; DP Barcode D167107
Subject: Reregistration of Linuron. Qualitative Nature of the Residue in Plants (potato metabolism study).
From: P. Deschamp
To: L. Rossi/ C. Peterson
Dated: 5/21/92
MRID(s): 41938101

CBRS No.: 10368; DP Barcode D181454
Subject: Linuron. Section 6(a)(2) Data. Review of "Residues of Lorox Herbicide in Potatoes and their Processed Fractions, Du Pont Project No. AMR 1698-90".
From: S. Knizner
To: L. Rossi and B. Burnam
Dated: 9/2/92
MRID(s): 42397201

CBRS No.: 10370; DP Barcode D181455
Subject: Linuron. Review of "Residues of Lorox Herbicide in Carrots as Affected by Cooking. Du Pont Project No. AMR 1701-90".
From: S. Knizner
To: C. Peterson
Dated: 9/8/92
MRID(s): 42379901

CBRS No.: 11063; DP Barcode D185892
Subject: Response to the Linuron Reregistration Standard: Residue Chemistry Data Waiver request
From: R. Perfetti
To: L. Rossi and E. Saito
Dated: 1/15/93
MRID(s): None

CBRS No.: 10586; DP Barcode D182595
Subject: Linuron: Soybean processing and an asparagus cooking study.
From: D. McNeilly
To: C. Peterson
Dated: 3/18/93
MRID(s): 42462901 and 42462902

CBRS No.: 11362; DP Barcode D188028
Subject: Linuron: Wheat Residue Data and a Waiver Request for Wheat Processing Study.
From: D. McNeilly
To: P. Perreault
Dated: 5/10/93
MRID(s): 42605901

CBRS No.: 11360; DP Barcode D188001
Subject: Linuron:: Corn Processing Study.
From: D. McNeilly
To: P. Perreault
Dated: 7/13/93
MRID(s): 42560001

CBRS No.: 11358; DP Barcode D187993

Subject: Linuron: Potato Metabolism Study, Sorghum Grain Processing Data, and a Waiver request for the Sorghum Grain Dust Study.
From: D. McNeilly
To: P. Perreault
Dated: 11/18/93
MRID(s): 42542101 and 42542102

CBRS No.: 11359; DP Barcode D187998
Subject: Linuron Soybean Metabolism Study.
From: D. McNeilly
To: P. Perreault
Dated: 11/18/93
MRID(s): 42548401

CBRS No.: 11361; DP Barcode: D188002
Subject: Linuron Poultry Metabolism Study.
From: D. McNeilly
To: P. Perreault
Dated: 11/18/93
MRID(s): 42635401

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Subject: Storage Stability: Asparagus and Wheat.
From: D. McNeilly
To: P. Perreault
Dated: 9/5/93
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