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

JUN 22 1989

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: New Chemical Review of Triasulfuron.

FROM: Richard D. Schmitt, Ph.D., Acting Chief
Dietary Exposure Branch
Health Effects Division (H7509C) Richard D Schmitt

TO: Reto Engler
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Health Effects Division (H7509C)

and

Robert Taylor, PM 25
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Registration Division (H7505C)

Attached are the Product and Residue Chemistry review packages for triasulfuron written in the Dietary Exposure Branch (DEB) and reflective of DEB policies. This review includes data received by DEB through April 12, 1989. The HED due date for this review is June 30, 1989.

This is a first time, food use, permanent tolerance request for triasulfuron. The reviews of the Product Chemistry and Residue Chemistry data have been formatted to serve as the Triasulfuron Registration Standard.

DEB's Product Chemistry review of triasulfuron is for the technical only. As required by the Registration Standard Policy group, the product chemistry data for end-use products are not included in this review.

The review contains an attachment, Confidential Appendix, with Confidential Business Information (CBI). The cc distribution of the copies containing material claimed as CBI is indicated below.

Attachments: Residue and Product Chemistry Review
CBI:Confidential Appendix

cc with all Attachments: M. Bradley, RF, PP8F3658, PMSD/ISB (E.Eldredge), Triasulfuron Reg. Std. F., TB/HED
cc without CBI Attachment: R. Jaeger, SAOS/SACB (Tomerlin, TAS), P. Fenner-Crisp (HED), Circulate

TRIASULFURON

New Chemical Review - Residue and Product Chemistry

Pesticide Petition No. 8F3658

Dietary Exposure Branch Nos. 4401, 4402, 4403, 4404, 5363

Trade Name AMBER

For Commodities wheat, barley, milk and
meat, fat and meat by products

Table of Contents

Introduction

Ciba-Geigy Corporation requests the establishment of tolerances for residues of the herbicide triasulfuron (3-(6-methoxy-4-methyl-1,3,5-triazin-2-yl)-1-[2-(2-chloro-ethoxy)-phenylsulfonyl]-urea, CGA-131036) in or on wheat and barley grain at 0.02 ppm, wheat and barley forage at 1 ppm, wheat and barley hay at 6 ppm, wheat and barley straw at 2 ppm, kidney of cattle, goats, hogs, horses, and sheep at 0.2 ppm, meat, fat, and meat by-products, excluding kidney, of cattle, goats, hogs, horses, and sheep at 0.1 ppm and milk at 0.02 ppm.

No permanent tolerances are established for triasulfuron. Temporary tolerances were recommended for the use of triasulfuron on wheat and barley in connection with Pesticide Petition (PP) No. 7G3551 (L. Cheng, February 5, 1988).

Conclusions

1. Adequate information has been submitted on the manufacturing process of triasulfuron, technical impurities and physical and chemical properties of the technical material.

Registration Division is responsible for determining whether the inert ingredients have been cleared under 40 CFR 180.1001 for food use.

2a. DEB concludes that the metabolic pathway in wheat is adequately understood and can be translated to barley.

2b. DEB concludes that the nature of the residue in ruminants and poultry is adequately understood for the proposed use.

2c. For the purpose of this petition, because of the very low residue level in the human food items, the residue to be regulated is the parent compound only, provided TOX has no concerns about any of the metabolites. **For any future uses, additional residue characterization may be needed.**

3a. Methods AG-500 and AG-508 should be revised to include the modifications used by the Analytical Chemistry Branch as stated in L. Cheng memo of March 23, 1989, PP#7G3551. Method AG-500 should also be revised to include the modifications to allow for a detection limit of 0.01 ppm in wheat and barley grain.

3b. DEB concludes that adequate analytical methodology is available to enforce the proposed tolerance provided the ongoing method trial is successful; that only the parent compound is to be regulated; that triasulfuron can be quantitated in the presence of the pesticides in group VII of the specificity study; and that methods AG-500 and AG-508 are suitably revised and

submitted.

4a. An analysis of all the 1X forage residue data (from the present submission and from PP#7G3551) show that a 2 ppm tolerance for forage with a 7 day pre harvest interval (PHI) would be more appropriate than the proposed 1 ppm tolerance.

4b. A proposed tolerance of 15 ppm is needed for wheat and barley hay to reflect a 7 fold increase in residue level for forage, (2 ppm) at 7 days PHI, dried to hay.

4c. Residue levels are not expected to exceed the proposed tolerances of 0.02 ppm on wheat and barley grain and of 2 ppm on wheat and barley straw from the proposed use.

4d. No food additive tolerances are needed for wheat or barley processed products.

5a. The proposed tolerances of 0.02 ppm in milk, 0.1 ppm in meat, fat and meat by-products except kidney and 0.2 ppm in kidney are not expected to be exceeded from the proposed use.

5b. There is no reasonable expectation that finite residues of triasulfuron will occur in poultry tissues and eggs as a result of the proposed use on wheat and barley.

6. The International Residue Limit Status sheet is attached. There are no Codex, Canadian or Mexican tolerances or limits for triasulfuron on wheat or barley.

Recommendation

DEB recommends against the proposed tolerances for triasulfuron on wheat, barley, meat and milk because of Conclusions 3a and 3b (methodology), and 4a and 4b (more appropriate tolerances). For further consideration of this petition, the deficiencies listed in the above Conclusions should be resolved.

Note to TOX: The residue will be regulated in terms of parent compound only, provided TOX has no concerns about any of the metabolites.

Detailed Considerations

Manufacture and Formulation

The manufacturing process for triasulfuron was submitted with PP#7G3551 and was reviewed with that petition (memo of L.

Cheng, February 5, 1988). The technical product is [redacted] triasulfuron. No residue problems are expected from the technical impurities.

The L. Cheng review found the product chemistry data adequate for the purpose of the temporary tolerance petition. For a permanent tolerance and full registration, Ciba-Geigy was requested to submit [redacted]

These data have now been submitted and appear in the Confidential Appendix, Attachment 8 to this review. The physical and chemical properties, not previously reviewed, appear in the appended Data Evaluation Record (DER), Attachment 2, and satisfy the requirements for the technical material.

Adequate information has been submitted on the manufacturing process of triasulfuron, technical impurities and physical and chemical properties of the technical material.

Triasulfuron is formulated as a water dispersible granule with the trade name Amber. The formulation contains 75% triasulfuron with 25% inert ingredients. Registration Division is responsible for determining whether the inert ingredients have been cleared under 40 CFR 180.1001 for food use.

Manufacturing process information is not included

Proposed Use

This petition was amended April 12, 1989 to revise Section B to clarify certain directions for use. Amber is to be applied by ground spray equipment only when the target weeds are actively growing and are no more than 2 inches in height or diameter. In addition, application to fall germinating weeds must be made before the weeds are exposed to freezing temperatures. In wheat and barley, Amber is to be applied post emergence from the two leaf stage to pre-boot stage. Application rates range from 8.09 g ai/A, 12.13 g ai/A to 24.5 g ai/A, depending on the target weeds. Maximum application rates are one application of 24.5 g ai/A or two applications of 12.13 g ai/A separated by at least 60 days per crop. All applications must be completed prior to boot stage. A surfactant such as X-77 should always be used. There is a restriction against grazing or feeding Amber treated wheat or barley until 7 days after application.

An amendment to this petition was submitted May 3, 1989 with directions for preemergence application to wheat and post emergence to fallow land. This proposal and residue data will not be discussed in this memo but will be the subject of a following memo.

Nature of the Residue

Plants

No new plant metabolism studies were submitted in this petition. Five metabolism studies on wheat were reviewed in connection with PP#7G3551 (memo of L. Cheng, February 5, 1988).

As requested in the above review, Chemical Abstract Service (CAS) Registry numbers for two metabolites are submitted (See Attachment 3, Addendum to DER, Attachment 1, PP#7G3551). Additional CAS registry numbers will be submitted as they become available.

DEB concludes that the metabolic pathway in wheat is adequately understood for the proposed use and can be translated to barley.

Animals

No new animal metabolism studies were submitted in this petition. Goat and laying hen metabolism studies were reviewed in connection with PP#7G3551 (memo of L. Cheng, February 5, 1988). The above review requested further characterization of the residue in goat liver for a permanent tolerance.

MRID 407283-02 Addendum to MRID 402719-07

Ciba-Geigy has submitted as a rationale comparison of the nature of terminal residues in the milk and kidneys of goats and a comparison of the metabolic pathways of triasulfuron in goat, hens and rats, that the terminal residues in the goat liver (0.007 ppm from [U-^{14}C]phenyl label, 0.011 ppm from [2,6-^{14}C]triazine label) consist of unchanged triasulfuron and a mixture of triasulfuron and CGA 150 829 (2-amino-4-methoxy-6-methyl-s-triazine).

As stated in the previous review, memo of L. Cheng, February 5, 1988, because of the extremely low levels of secondary residues transferred to poultry meat and eggs, even at 10X the anticipated feeding level, no additional characterization of the residue is needed for this proposed use.

DEB concludes that the nature of the residue in ruminants and poultry is adequately understood for the proposed use.

For the purpose of this petition, because of the very low residue level in the human food items, wheat and barley grain (0.003 - 0.011 ppm parent equivalents total radioactivity) and the low levels in meat and milk from the maximum feeding level (0.09 and 0.04 ppm respectively, parent equivalents total radioactivity), the residue to be regulated is the parent

compound provided TOX has no concerns about any of the metabolites. For any future uses, additional residue characterization may be needed.

Analytical Methodology

The analytical methods used for residue data in plants and animals were reviewed in connection with PP#7G3551 (memo of L. Cheng, February 5, 1988). Analytical method AG-500, for residues in plant tissue and analytical method AG-508, for residues in animal tissues, milk and eggs, are high performance liquid chromatography (HPLC) methods using column switching and ultra violet detection and determine the parent compound only. The detection limits are 0.05 ppm in plant tissues; 0.01 ppm for milk and 0.05 ppm for all other animal substrates. Control samples are less than the limit of detection. Recoveries from fortifications of 0.05 to 5 ppm in forage and animal tissues; 0.01 to 0.2 ppm in grain and milk were satisfactory.

Method trials have been conducted on wheat grain and straw, beef muscle, kidney and milk in connection with the temporary petition (memo of L. Cheng, PP#7G3551, March 23, 1989). Method AG-500 was modified by reducing the mobile phase flow rate to eliminate interference and gave satisfactory recoveries of 77-105% for wheat grain at fortification levels of 0.1 and 0.5 ppm, and 70-77% for wheat straw at fortification levels of 0.5 and 1 ppm. Method AG-508 was also modified by reducing the mobile phase flow rate to eliminate interference and a different filtration technique for milk. Satisfactory recoveries were obtained of 68-80% for milk at fortification levels of 0.01 and 0.05 ppm; 65-100% for beef muscle at fortification levels of 0.05 and 0.1 ppm; and 69-85% for beef kidney at fortification levels of 0.5 and 1.0 ppm.

MRID 410479-00, 410479-01 Addendum to MRID 402719-09

Ciba-Geigy has revised their proposed tolerances for wheat, barley, meat and milk in this petition. The revised tolerance for wheat and barley grain of 0.02 ppm required an addendum to the analytical method to allow for a detection limit of 0.01 ppm. The remaining revised tolerances are sufficiently supported by the previous method trial. This modification of method AG-500 consists of a change in the concentration of the final extract and injection volume. A new method validation was requested May 30, 1989 for wheat or barley grain at 0.01 and 0.02 ppm fortification levels.

Ciba-Geigy has submitted a method specificity study (See DER, Attachment 4) for method AG-500 by fortifying reagent blanks (without the presence of biological substrate) with maximum tolerance level amounts of 70 pesticides (in seven different

groups) having permanent or temporary tolerances on wheat and barley and analyzing the fortified reagent blanks by the method.

Chromatograms from the analysis of the reagent blank and the seven groups of pesticides show little or no interference in the reference window for triasulfuron, except for those in group VII where considerable interference is evident. The registrant should show that triasulfuron in the presence of the pesticides in group VII could be quantitated at the 0.01 and/or 0.05 ppm level.

MRID 407283-04 Multiresidue Study

The parent compound and four metabolites were tested through the four Food and Drug Administration (FDA) multiresidue protocols as required by 40 CFR 158.125(b)(15). This submission is being forwarded to FDA for their evaluation.

Methods AG-500 and AG-508 should be revised to include the modifications used by the Analytical Chemistry Branch as stated in L. Cheng memo of March 23, 1989, PP#7G3551. Method AG-500 should also be revised to include the modifications to allow for a detection limit of 0.01 ppm in wheat and barley grain.

DEB concludes that adequate analytical methodology is available to enforce the proposed tolerance provided the ongoing method trial is successful; that only the parent compound is to be regulated; that triasulfuron can be quantitated in the presence of the pesticides in group VII of the specificity study; and that methods AG-500 and AG-508 are suitably revised and submitted.

Residue Data

Storage Stability of Residues

Additional storage stability data for triasulfuron residues in wheat forage, grain and straw are detailed in DER, Attachment 5.

Triasulfuron residues are essentially stable in wheat forage, straw, and grain under freezer storage conditions (-15°C) for up to 24 months, the same length of storage residue samples were held before analysis.

Residue Studies

Eight additional field residue trials were conducted in major wheat and barley growing areas of the U. S. A total of 24 residue studies on wheat, 19 of which were submitted with

PP#7G3551, and 14 residue studies on barley, 11 of which were submitted with PP#7G3551, have been conducted for this proposed use of triasulfuron (previously submitted residue data were reviewed in memo of L. Cheng, February 5, 1988). Field trials have been conducted in 80% of the major wheat and barley growing states according to "Agricultural Statistics 1984". Various formulations including 20WG, 75WG (wettable granules), 20WDG (wettable dispersible granule) and 50TB (tablet formulation) were applied.

In the present studies, both winter and spring varieties of wheat and barley were treated. Treatments consisted of a single post-over-the-top application of triasulfuron 20WG or 50TB formulations at pre-boot (Feekes Stage 9) growth stage. Application rates were 24.5 g ai/A (0.054 lb ai/A) - 1X rate or 49 g ai/A (0.11 lb ai/A) - 2X rate. In all cases the surfactant X-77 was applied.

Wheat and barley forage was sampled on the day of treatment and at weekly intervals up to 29 days after treatment. Maximum residues from the 1X rate were 4.7 ppm at day 0, 0.74 ppm at day 7, 0.6 ppm at day 14, 0.24 ppm at day 21 and 0.38 ppm at day 28. In most of the studies, residues were non-detectable (<0.05 ppm) 14 days after treatment. Maximum residues from the higher rate were 9.6 ppm at day 0, 1.37 ppm at day 7, 0.75 ppm at day 14, 0.48 ppm at day 21 and 1.14 ppm at day 28.

An analysis of all the 1X forage residue data (from the present submission and from PP#7G3551) show that a 2 ppm tolerance for forage with a 7 day pre harvest interval (PHI) would be more appropriate that the proposed 1 ppm tolerance.

No detectable (<0.01 ppm) residues were found in wheat or barley grain from either application rate. PHIs were 37 to 80 days.

The maximum residue in wheat and barley straw at harvest was 1.03 ppm (55 day PHI) from the lower application rate and 1.34 ppm (55 day PHI) from the higher application rate; the majority of studies at the lower application rate showed no detectable (<0.05 ppm) residue on straw at harvest.

Samples of zero day wheat and barley forage from two wheat and three barley trials, were air dried. Initial forage residues ranged from 0.63 to 2.6 ppm. Hay to forage ratios ranged from 1.5 to 7.2, indicating a maximum concentration from forage to hay of 7X.

A proposed tolerance of 15 ppm is needed for wheat and barley hay to reflect a 7 fold increase in residue level for forage, (2 ppm) at 7 days PHI, dried to hay.

There appears to be no significant differences in residues from the use of the various formulations.

Processing studies were conducted on grain from two wheat and one barley study. Each study consisted of treatments at the lower and higher application rates. No residues were detected (<0.01 ppm) on the processed fractions which included bran, germ, shorts, red dog and flour (wheat) or bran, pearlings, endosperms and flour (barley).

No food additive tolerances are needed for wheat or barley processed products.

Residue levels are not expected to exceed the proposed tolerances of 0.02 ppm on wheat and barley grain and of 2 ppm on wheat and barley straw.

Meat, Milk, Poultry and Eggs

Storage Stability of Residues

Triasulfuron residues are essentially stable in beef liver, poultry breast, eggs, and milk under freezer storage conditions (-15°C) for up to six months. The longest interval between animal sacrifice and laboratory analysis was one month.

Feeding Studies

No new animal feeding studies were submitted in this petition. Cattle and laying hen feeding studies were reviewed in connection with PP#7G3551 (memo of L. Cheng, February 5, 1988).

The maximum theoretical dietary burden for cattle would be 70% hay at 15 ppm (10.5 ppm) plus 30% forage at 2 ppm (0.6 ppm) for a total of 11 ppm. The lowest feeding level was 15 ppm in the diet where the residue in kidney was 0.12 - 0.18 ppm and the residue in the remaining cattle tissues and milk was non detectable (<0.05 or <0.01 ppm).

The proposed tolerances of 0.02 ppm in milk, 0.1 ppm in meat, fat and meat by-products except kidney and 0.2 ppm in kidney are not expected to be exceeded from the proposed use.

The maximum theoretical dietary burden for poultry would be 100% grain or 0.02 ppm. No detectable (<0.05 ppm) residues were found in any chicken tissue or eggs from feeding levels of 0.1, 0.5 and 1 ppm.

There is no reasonable expectation that finite residues of triasulfuron will occur in poultry tissues and eggs as a result of the proposed use on wheat and barley.

International Residue Limit Status

The International Residue Limit Status sheet is attached as Attachment 1. There are no Codex, Canadian or Mexican tolerances or limits for triasulfuron on wheat or barley.

Attachment 1: International Residue Limit Status sheet
Attachments 2 through 7: Data Evaluation Records

2	Physical and chemical properties	402719-03
3	Plant metabolism	407283-01
4	Specificity of analytical method	407283-03
5	Wheat storage stability	407283-06
6	Residue data	407283-05
7	Animal products storage stability	407601-01

Attachment 8: Confidential Appendix

H7509C:DEB:M Bradley:mb:CM#2:Rm810:557-7324:03/07/89
RDI:RSQuick:06/15/89:RALoranger:06/16/89

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Triasulfuron

CODEX NO. 158

CODEX STATUS:

/X/ No Codex Proposal Step 6 or above

Residue (if Step 8):_____

PROPOSED U.S. TOLERANCES:

Petition No. 8F3665

RCB Reviewer M. Bradley

Residue: Triasulfuron

Crop(s)	Limit (mg/kg)	Crop(s)	Limit (mg/kg)
		barley & wheat forage	1.0
		barley & wheat hay	6.0
		barley & wheat straw	2.0
		barley & wheat grain	0.02
		milk	0.02
		meat except kidney	0.1
		kidney	0.2

CANADIAN LIMITS:

/X/ No Canadian limit

Residue:_____

MEXICAN LIMITS:

/X/ No Mexican limit

Residue:_____

Crop(s)	Limit (mg/kg)	Crop(s)	Limit (mg/kg)

NOTE:

Form revised 1986

DATA EVALUATION RECORD

MRID #:	402719-03
DEB #:	4401, 4402, 4403, 4404
REVIEWER:	Martha J. Bradley
SECONDARY REVIEWER:	Robert S. Quick
PETITION/EPA REG #:	PP8F3658
STUDY TYPE:	Physical and Chemical Properties
STUDY TITLE:	Determination of Octanol-Water Partition Coefficient of ^{14}C-CGA-131036
TEST CHEMICAL:	3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5
OTHER NAMES:	triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide
REPORT ID:	PC-87-001, #35108
AUTHORS:	R. W. Brown, Julie Warren
DATE OF REPORT:	December 12, 1986
COMPANY/APPLICANT:	Ciba-Geigy

CONCLUSIONS

The physical and chemical properties satisfy the requirements for the technical material.

Summary of Method and Procedure

Solutions of CGA-131036 were prepared in test water at a concentration of 50 micrograms per milliliter and 5 micrograms per milliliter. The test solutions were dosed with ^{14}C-CGA-131036 and partitioned with octanol. The ratio of ^{14}C-activity in the octanol phases of the samples to the ^{14}C-activity in the aqueous phases of the samples was used to calculate the partition coefficient of the test compound. The mean measured partition coefficient of CGA-131036 was determined to be 0.31, and mean measured log P value was determined to be -0.58.

Reported Results and Reviewer's Comments

The Physical and Chemical Properties of technical CGA-131036 are listed below.

Color (63-2)	White
Physical State (63-3)	Solid crystals
Odor (63-4)	No odor at room temperature
Melting Point (63-5)	186° C (with decomposition)
Density (63-7)	1.46g/cm^3 typical at 20° C
Solubility (63-8)	Water pH 2.5 : 5 ppm Water pH 5 : 40 ppm Water pH 7 : 1500 ppm Methanol : 0.34% Acetone : 1.6% Cyclohexanone : 1.7% Methylenechloride: 1.5% n-octanol : 180 ppm Xylene : 166 ppm n-hexane : 0.2 ppm
Vapor Pressure (63-9)	7.5×10^{-13} mm Hg at 20° C 7.5×10^{-12} mm Hg at 30° C 7.5×10^{-11} mm Hg at 40° C
Dissociation Constant (63-10)	pK_a-value = 4.5 (Acid.)
Octanol/Water partition coefficient (63-11)	K_{ow} = 0.31
pH (63-12)	5 at 24°C (saturated solution)
Stability	Original at 20°C; 93.9% 12 weeks at 35°C; 94.2% 2 weeks at 54°C; 94.0% 12 weeks at 54°C; 93.5%

DATA EVALUATION RECORD

Addendum to Attachment 1, PP7G3551, MRID # 402719-06

MRID #:	407283-01
DEB #:	4401, 4402, 4403, 4404
REVIEWER:	Martha J. Bradley
SECONDARY REVIEWER:	Robert S. Quick
PETITION/EPA REG #:	PP8F3658
STUDY TYPE:	Plant Metabolism (wheat)
STUDY TITLE:	CGA-131036 - Nature of the Residue in Wheat Metabolism
TEST CHEMICAL:	3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5
OTHER NAMES:	triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide
REPORT ID:	ABR-86086
AUTHORS:	J. E. Cassidy
DATE OF REPORT:	April, 1987
COMPANY/APPLICANT:	Ciba-Geigy

CONCLUSIONS

Chemical Abstracts Service (CAS) Registry numbers for two metabolites in the Data Evaluation Record (DER) (MRID # 402719-06) are submitted. CGA-150829, 2-amino-4-methoxy-6-methyl-s-triazine, CAS Number 1668-54-8. G-28521, cyanuric acid (2,4,6-trihydroxy-s-triazine), CAS Number 108-80-5. Ciba-Geigy states that CAS registry numbers for the remaining compounds given in the above DER will be provided as they become available.

DATA EVALUATION RECORD

Addendum to Attachment 4, PP7G3551, MRID #402719-09

MRID #:	407283-03
DEB #:	4401, 4402, 4403, 4404
REVIEWER:	Martha J. Bradley
SECONDARY REVIEWER:	Robert S. Quick
PETITION/EPA REG #:	PP8F3658
STUDY TYPE:	Specificity of Analytical Method
STUDY TITLE:	Specificity of Analytical Method AG-500 for the Determination of CGA-131036 Residues in Crop Samples by Liquid Chromatography with Column Switching
TEST CHEMICAL:	3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5
OTHER NAMES:	triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide
REPORT ID:	ABR-88056
AUTHORS:	R. K. Williams
DATE OF REPORT:	April 28, 1988
COMPANY/APPLICANT:	Ciba-Geigy

CONCLUSIONS

Method # AG-500 is specific for triasulfuron in the presence of group I through group VI of pesticides that may be applied to wheat or barley. Considerable interference is evident in the analysis of group VII. The registrant should show that triasulfuron in the presence of the pesticides in group VII could be quantitated at the 0.01 and/or 0.05 ppm level.

Test Materials and Methods

The maximum tolerance level (based on a 20 gram sample) of each of 70 pesticides having permanent or temporary tolerances on wheat or barley as specified in The Pesticide Chemical News Guide, January 1, 1988 was added to a reagent blank and analyzed by method AG-500. The 70 pesticides were added in 7 groups and were analyzed simultaneously with a reagent blank and two triasulfuron fortified reagent blanks of 0.01 and 0.05 ppm.

Five pesticides were not tested by method AG-500 on the basis of physical and/or chemical properties, for safety reasons or they were not commercially available. These chemicals are: 40 CFR 180.225 Aluminum phosphide, 40 CFR 180.375 Magnesium phosphide, 40 CFR 180.130 Hydrogen cyanide, 40 CFR 180.125 Calcium cyanide, and 40 CFR 180.397 Ethylene dibromide.

The 70 pesticides tested were combined into 7 groups as follows:

Group I

40 CFR 180	Chemical	40 CFR 180	Chemical
.104	Heptachlor epoxide	.121	Parathion
.105	Demeton	.123	Inorg. Bromides
.106	Diuron	.127	Piperonyl Butoxide
.111	Malathion	.128	Pyrethrins
.115	Zineb	.138	Toxaphene

Group II

.142	2,4-D	.184	Linuron
.153	Diazinon	.198	Trichlorfon
.154	Azinphos-methyl	.204	Dimethoate
.169	Carbaryl	.205	Paraquat
.176	Zinc Ion + Maneb	.206	Phorate
.182	Endosulfan	.207	Trifluralin
.183	Disulfoton		

Group III

.215	Naled	.253	Methomyl
.220	Atrazine	.254	Carbofuran
.227	Dicamba	.265	Terbutryn
.235	Dichlorvos	.268	Barban

.242	Thiabendazole	.274	Propanil

Group IV

.277	Diallate	.294	Benomyl
.297	Chlorbromuron	.300	Ethophon
.281	Dinoseb	.301	Carboxin
.288	Busan 72	.304	Oryzalin
.292	Picloram	.307	Cyanazine

Group V

.314	Triallate	.350	Nitrapyrin
.319	Propham	.351	Benifox
.324	Bromoxynil	.364	Glyphosate
.332	Metribuzin	.368	Metolachlor
.339	MCPA	.369	Difenzoquat

Group VI

.370	Terrazole	.405	Chlorsulfuron
.371	Thiophonate-methyl	.408	Metalaxyl
.385	Diclofop-methyl		

Group VII

.410	Triadimefon	.428	Metsulfuron-methyl
.413	Imazalil	.431	Clopyralid
.419	Chlorpyrifos methyl	.434	Propiconazole
.423	Fenridazone-potassium		

Reported Results and Reviewer's Comments

Recoveries from the triasulfuron fortifications were 84% for both the 0.01 and 0.05 ppm levels. Chromatograms from the analysis of the reagent blank and seven groups of pesticides used on wheat or barley show little or no interference in the reference peak window for triasulfuron except for group VII. The registrant should show that triasulfuron in the presence of group VII pesticides could be quantitated at the 0.01 and/or 0.05 ppm level.

DATA EVALUATION RECORD

Addendum to Attachment 11, PP7G3551, MRID #402719-16

MRID #:	407283-06
DEB #:	4401, 4402, 4403, 4404
REVIEWER:	Martha J. Bradley
SECONDARY REVIEWER:	Robert S. Quick
PETITION/EPA REG #:	PP8F3658
STUDY TYPE:	Storage stability (wheat)
STUDY TITLE:	Triasulfuron - Storage Stability in Wheat and Barley Under Freezer Conditions for 24 Months
TEST CHEMICAL:	3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5
OTHER NAMES:	triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide
REPORT ID:	ABR-88078
AUTHORS:	L. E. Williams
DATE OF REPORT:	May 25, 1988
COMPANY/APPLICANT:	Ciba-Geigy

CONCLUSIONS

Triasulfuron residues are essentially stable in wheat and barley forage, straw, and grain under freezer storage conditions (-15°C) for up to 24 months.

Test Materials and Methods

This study is an extension of that reported in the Data Evaluation Record, Attachment 11, PP7G3551, MRID #402719-16. In addition to the fortified samples analyzed up to 6 months of frozen storage, samples were taken after 12 and 24 months of frozen storage.

Reported Results and Reviewer's Comments

The additional results are tabulated below.

Percent Recovery at 0.2 ppm Fortification

	Fortified, Stored			Fortified, Fresh		
Interval	Forage	Grain	Straw	Forage	Grain	Straw
0 day				96,84	83,72	101,110
12 mos	85,90	73,92	72,72	76	81	70
24 mos	79,80	81,82	49,68	76	81	59

Triasulfuron residues are essentially stable in wheat and barley forage, straw, and grain under freezer storage conditions (-15°C) for up to 24 months.

DATA EVALUATION RECORD

Addendum to Attachments 7 and 8, PP7G3551, MRID #402719-12, -13

MRID #: 407283-05

DEB #: 4401, 4402, 4403, 4404

REVIEWER: Martha J. Bradley

SECONDARY REVIEWER: Robert S. Quick

PETITION/EPA REG #: PP8F3658

STUDY TYPE: Wheat and barley residue data

STUDY TITLE: Triasulfuron - Magnitude of the Residues in Wheat, Wheat Process Fractions, Barley and Barley Process Fractions Resulting from Applications of Amber

TEST CHEMICAL: 3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5

OTHER NAMES: triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide

REPORT ID: ABR-88082 AUTHORS: L. E. Williams

DATE OF REPORT: May 24, 1988 COMPANY/APPLICANT: Ciba-Geigy

CONCLUSIONS

Maximum residues in wheat and barley forage, treated at 0.054 lb ai/A were 4.7 ppm at day 0, 0.74 ppm at day 7, 0.6 ppm at day 14, 0.24 ppm at day 21 and 0.38 ppm at day 28. Maximum residues in wheat and barley forage treated at 0.11 lb ai/A were 9.6 ppm at day 0, 1.37 ppm at day 7, 0.75 ppm at day 14, 0.48 ppm at day 21 and 1.14 ppm at day 28. No detectable (<0.01 ppm) residues were found in wheat or barley grain at harvest (PHI 37-80 days) from either of the above application rates. Maximum residues in straw at harvest were 1.03 ppm (0.054 lb ai/A, PHI 55 days) and 1.34 ppm (0.11 lb ai/A, PHI 55 days). The maximum concentration of triasulfuron from forage to hay was 7X.

Processing studies on wheat and barley grain treated at the two above rates showed no detectable (<0.01 ppm) residues on any processed products.

Test Materials and Methods

Eight field residue trials were conducted in major wheat and barley growing areas of the U. S, 5 studies on wheat and 3 studies on barley. Two formulations, 20WG (wettable granules) and 50TB (tablet formulation) were applied.

Both winter and spring varieties of wheat and barley were treated. Treatments consisted of a single post-over-the-top application of triasulfuron at pre-boot (Feekes Stage 9) growth stage. Application rates were 24.5 g ai/A (0.054 lb ai/A) or 49 g ai/A (0.11 lb ai/A). In all cases the surfactant X-77 was applied.

Forage samples were collected immediately after application, generally on the same day and in some tests, at weekly intervals to determine the dissipation of the herbicide in the crop. Straw and grain were collected from all tests at normal harvest. Forage from several tests were allowed to air-dry to provide hay samples. After collection, the samples were frozen, shipped with dry ice to NC and stored in a freezer at -15°C until analysis.

Method AG-500 was used for all samples. The method measures the parent compound only. The method was reviewed in connection with PP#7G3551 (memo of L. Cheng, February 5, 1988).

Reported Results and Reviewer's Comments

The residue data are tabulated on pages ** of this DER.

Wheat and barley forage was sampled on the day of treatment and at weekly intervals up to 29 days after treatment. Maximum residues from the lower rate were 4.7 ppm at day 0, 0.74 ppm at day 7, 0.6 ppm at day 14, 0.24 ppm at day 21 and 0.38 ppm at day 28. In most of the studies, residues were non-detectable (<0.05 ppm) 14 days after treatment. Maximum residues from the higher rate were 9.6 ppm at day 0, 1.37 ppm at day 7, 0.75 ppm at day 14, 0.48 ppm at day 21 and 1.14 ppm at day 28.

No detectable (<0.01 ppm) residues were found in wheat or barley grain from either application rate. Pre harvest intervals (PHIs) were 37 to 80 days.

The maximum residue in wheat and barley straw at harvest was 1.03 ppm (55 day PHI) from the lower application rate and 1.34 ppm (55 day PHI) from the higher application rate; the majority of studies at the lower application rate showed no detectable (<0.05 ppm) residue on straw at harvest.

Samples of zero day wheat and barley forage from two wheat and three barley trials from both application rates, were air

dried. Initial forage residues ranged from 0.63 to 2.6 ppm. Hay to forage ratios ranged from 1.5 to 7.2, indicating a maximum concentration from forage to hay of 7X.

There appears to be no significant differences in residues from the use of the wettable powder or tablet formulations.

Storage stability data are discussed in the storage stability DER. The submitted data show no significant loss of residue during a 24 month freezer storage period in wheat grain, forage, and straw. The longest interval between crop sampling and laboratory analysis in any study was 24 months.

Processing studies were conducted on grain from two wheat and one barley study. Each study consisted of treatments at the lower and higher application rates. No residues were detected (<0.01 ppm) on the processed fractions which included bran, germ, shorts, red dog and flour (wheat) or bran, pearlings, endosperms and flour (barley).

Site	g ai/A[1]	PHI days	Substrate	Residue ppm	
Formulation - 20 WG with 0.25% X-77 as Surfactant					
Wheat					
PA	24.5	0	forage	2.4	1.49
		7		0.06	0.06
		14		<0.05	<0.05
		22		<0.05	<0.05
		28		<0.05	<0.05
		57	straw	<0.05	<0.05
		57	grain	<0.01	<0.01
ND	24.5	0	forage	2.8	4.7
		51	straw	<0.05	<0.05
		51	grain	<0.01	<0.01
OK	24.5	0	forage	0.83	0.63
		0	hay	0.85	3.2
		68	straw	<0.05	<0.05
		68	grain	<0.01	<0.01
CA	24.5	0	forage	0.84	1.26
		80	straw	<0.05	<0.05
		80	grain	<0.01	<0.01
Barley					
CA	24.5	0	forage	0.5	0.58
		0	hay	3.3	4.2
		80	straw	<0.05	<0.05
		80	grain	<0.01	<0.01
CA	24.5	0	forage	1.49	1.64
		7		0.58	0.74
		14		0.35	0.30
		21		0.24	0.19
		28		0.13	0.10
		0	hay	6.3	5.2
		55	straw	0.54	0.65
		55	grain	<0.01	<0.01
ND	24.5	0	forage	0.76	0.46
		7		0.10	0.09
		14		<0.05	<0.05
		21		<0.05	<0.05

[1]24.5 g ai/A = 0.054 lbs. ai/A
49 g ai/A = 0.110 lbs. ai/A

Site	g ai/A[2]	PHI days	Substrate	Residue ppm	
ND	24.5	29	forage	<0.05	<0.05
		0	hay	1.69	1.02
		37	straw	<0.05	<0.05
		37	grain	<0.01	<0.01
Formulation - 50TB with 0.25% X-77 as Surfactant					
Wheat					
PA	24.5	0	forage	1.44	1.27
		7		<0.05	0.08
		14		<0.05	<0.05
		22		<0.05	<0.05
		28		<0.05	<0.05
		57	straw	<0.05	<0.05
		57	grain	<0.01	<0.01
	49.	0	forage	3.00	
		7		0.16	
		14		<0.05	
		22		<0.05	
		28		<0.05	
		57	straw	<0.05	
		57	grain	<0.01	
ND	24.5	0	forage	3.3	3.5
		51	straw	<0.05	<0.05
		51	grain	<0.01	<0.01
ND	49	0	forage	9.6	
		51	straw	<0.05	
		51	grain	<0.01	
OK	24.5	0	forage	2.6	2.1
		0	hay	5.8	7.2
		68	straw	0.07	0.05
		68	grain	<0.01	<0.01
	49.	0	forage	3.4	
		0	hay	8.6	
		68	straw	<0.05	
		68	grain	<0.01	
CA	24.5	0	forage	0.93	1.02
		80	straw	<0.05	<0.05
		80	grain	<0.01	<0.01

[2]24.5 g ai/A = 0.054 lbs. ai/A
49 g ai/A = 0.110 lbs. ai/A

Site	g ai/A[3]	PHI days	Substrate	Residue ppm	
CA	49.	0	forage	2.5	
		80	straw	<0.05	
		80	grain	<0.01	
KS	24.5	0	forage	0.58	1.00
		7		0.24	0.30
		14		<0.05	<0.05
		21		<0.05	<0.05
		28		<0.05	<0.05
		0	hay	0.78	0.72
		49	straw	<0.05	<0.05
		49	grain	<0.01	<0.01
	49.	0	forage	2.2	
		7		0.60	
		14		<0.05	
		21		<0.05	
		28		<0.05	
		0	hay	2.3	
		49	straw	<0.05	
		49	grain	<0.01	
Barley					
CA	24.5	0	forage	0.91	0.82
		0	hay	2.3	3.3
		80	straw	<0.05	<0.05
		80	grain	<0.01	<0.01
	49.	0	forage	1.43	
		0	hay	7.5	
		80	straw	<0.05	
		80	grain	<0.01	
CA	24.5	0	forage	1.7	2.5
		7		0.62	0.53
		14		0.35	0.60
		21		0.34	0.30
		28		0.24	0.38
		0	hay	3.8	4.3
		55	straw	0.67	1.03
		55	grain	<0.01	<0.01
	49	0	forage	3.2	
		7		1.37	
		14		0.75	
		21		0.48	
		28		1.14	

[3]24.5 g ai/A = 0.054 lbs. ai/A
49 g ai/A = 0.110 lbs. ai/A

Site	g ai/A[4]	PHI days	Substrate	Residue ppm	
CA	49.	0	hay	7.7	
		55	straw	1.34	
		55	grain	<0.01	
ND	24.5	0	forage	0.69	0.44
		7		0.08	0.07
		14		<0.05	<0.05
		21		<0.05	<0.05
		28		<0.05	<0.05
		0	hay	1.66	
		37	straw	<0.05	<0.05
		37	grain	<0.01	<0.01
	49.	0	forage	1.89	
		7		0.11	
		14		<0.05	
		21		<0.05	
		28		<0.05	
		0	hay	2.9	
		37	straw	<0.05	
		37	grain	<0.01	

Formulation - 50TB with 0.50% X-77 as Surfactant

Wheat

PA	24.5	0	forage	1.60	1.33
		7		<0.05	0.05
		14		<0.05	<0.05
		22		<0.05	<0.05
		28		<0.05	<0.05
		57	straw	<0.05	<0.05
		57	grain	<0.01	<0.01
ND	24.5	0	forage	3.69	3.86
		51	straw	<0.05	<0.05
		51	grain	<0.01	<0.01
OK	24.5	0	forage	1.18	1.54
		0	hay	4.90	4.90
		68	straw	<0.05	<0.05
		68	grain	<0.01	<0.01

[4]24.5 g ai/A = 0.054 lbs. ai/A
49 g ai/A = 0.110 lbs. ai/A

Site	g ai/A[5]	PHI days	Substrate	Residue ppm	
KS	24.5	0	forage	0.50	0.70
		7		0.37	0.28
		14		<0.05	<0.05
		21		<0.05	<0.05
		28		<0.05	<0.05
		0	hay	0.41	0.70
		49	straw	<0.05	<0.05
		49	grain	<0.01	<0.01
CA	24.5	0	forage	0.96	0.83
		80	straw	<0.05	<0.05
		80	grain	<0.01	<0.01

[5]24.5 g ai/A = 0.054 lbs. ai/A
49 g ai/A = 0.110 lbs. ai/A

DATA EVALUATION RECORD

Addendum to Attachment 11, PP7G3551, MRID #402719-16

MRID #:	407601-01
DEB #:	4401, 4402, 4403, 4404
REVIEWER:	Martha J. Bradley
SECONDARY REVIEWER:	Robert S. Quick
PETITION/EPA REG #:	PP8F3658
STUDY TYPE:	Storage stability (animal products)
STUDY TITLE:	Triasulfuron - Storage Stability in Meat, Milk and Eggs
TEST CHEMICAL:	3-(6-Methoxy-4-methyl-1,3,5-triazin-2-yl)-1-(2-(2-chloroethoxy)phenylsulfonyl)urea CAS#82097-50-5
OTHER NAMES:	triasulfuron, Amber, CGA-131036, 2-(2-chloroethoxy)-N-(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl) benzenesulfonamide
REPORT ID:	ABR-88081
AUTHORS:	L. E. Williams
DATE OF REPORT:	May 25, 1988
COMPANY/APPLICANT:	Ciba-Geigy

CONCLUSIONS

Triasulfuron residues are essentially stable in beef liver, poultry breast, eggs and milk under freezer storage conditions (-15°C) for up to six months.

Test Materials and Methods

Eggs, milk, poultry breast and beef liver samples were fortified and stored in a freezer at -15°C. Analyses were conducted on controls and fortified samples at the time of fortification and at one, three and six month intervals. Fortification levels were 0.2 ppm in eggs, 0.1 ppm in milk and 0.4 ppm in beef liver and poultry breast.

The analytical method used was AG-508 which was reviewed in memo of L. Cheng, February 5, 1988, PP#7G3551.

Reported Results and Reviewer's Comments

The results are tabulated below.

Percent Recovery

Interval	Fortified, Stored				Fortified, Fresh			
	Breast	Liver	Eggs	Milk	Breast	Liver	Eggs	Milk
0 day					105	98	105	87
					90	102	123	100
1 mo	82	48	79	115	100	78	98	96
	67	54	89	83				
3 mos	97	102	105	88	79	94	107	111
	114	90	107	83				
6 mos	79	73	68	96	59	85	84	107
	72	80	86	116				

Triasulfuron residues are essentially stable in poultry breast, beef liver, milk and eggs under freezer storage conditions (-15°C) for up to six months.