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

Terrestrial
plant study

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

June 27, 1989

SUBJECT: Proposed Registration of a New Pesticide

FROM: *James W. Akerman*
James W. Akerman
Ecological Effects Branch
Environmental Fate and Effects Division H7507C

TO: Robert Taylor (PM 25)
Herbicide/Fungicide Branch
Registration Division H7505C

Attached is the registration standard for the registration of Triasulfuron as technical and for use on turf and noncrop areas, and wheat and barley.

Reg No: 100-AOE CGA-131036 as Technical
100-TNR Amber for use on Wheat and Barley
100-AOG Trump for use on Turf and Noncrop areas

Based on the available toxicity information and proposed uses, the EEB concludes the following:

1. Additional data/information are required:

- A. The acute shrimp test must be repeated, because a NOEL was not obtained;
- B. The raw data for the Quahog clam study must be provided;
- C. The growth (length/weight) data sheets for the freshwater fish early life stage study must be resubmitted, the ones provided were not legible;
- D. An acute contact LD50 study with honey bees (141-1) is required.
- E. Tier III (124-1,2) terrestrial and aquatic phytotoxicity testing is required;

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F. Results from EFGWB terrestrial and aquatic field dissipation studies; and

G. Results from a fish bioaccumulation study (72-6).

2. Use of an herbicide on noncrop areas is likely to result in exposure to endangered plant species. Formal consultation with USFWS has been initiated for the noncropland cluster. Even though triasulfuron was not included specifically with that consultation, labeling for Triasulfuron will be developed based on that portion of the biological opinion dealing with herbicides.

3. The EEB concludes that use of triasulfuron on wheat, barley, turf and noncrop areas at around 0.05 lb. ai/acre will result in minimal impact to terrestrial and aquatic organisms. Triasulfuron is expected to impact nontarget terrestrial and aquatic plant species. Field testing with plants is required. Endangered species are unlikely to be affected except that endangered plants may be affected by the noncropland use.

If you have questions, please contact Dan Rieder.

Triasulfuron

Ecological Effects Topical Summary

Effects on Birds

Six Studies in two documents were evaluated under this topic. All studies were acceptable for use in a hazard assessment.

<u>Author</u>	<u>Date</u>	<u>MRID No</u>
Fletcher	1984	402719-58, 59, 61
Fletcher	1986	404564-07, 08

In order to establish the toxicity of Triasulfuron to birds, the following tests are required using the technical grade material: Two subacute dietary studies, one with a species of waterfowl (preferably mallard duck) and one with a species of upland game bird (preferably bobwhite quail or ring-necked pheasant); and an avian single - dose oral study on one species (preferably either mallard duck or bobwhite quail).

The acute oral toxicity tests are acceptable for use in a hazard assessment and are described below:

<u>Species</u>	<u>T.M.</u>	<u>LD50 mg/kg</u>	<u>Author</u>	<u>Date</u>	<u>ID Num.</u>	<u>Fulfills Req.</u>
Mallard	94.5%	>2150	Fletcher	1984	402719-58	yes
Bobwhite	94.5%	>2150	Fletcher	1984	402719-58	yes

The guideline requirement (71-1) for an avian acute oral study has been satisfied.

The acceptable subacute dietary toxicity studies for use in a hazard assessment are listed below:

<u>Species</u>	<u>T.M.</u>	<u>LC50 (ppm)</u>	<u>Author</u>	<u>Date</u>	<u>ID Num.</u>	<u>Fulfills Req.</u>
Bobwhite	94.5%	>5000	Fletcher	1984	402719-61	yes
Mallard	94.5%	>5000	Fletcher	1984	402719-59	yes

The guideline requirements (71-2) for avian subacute

dietary toxicity tests have been satisfied. There is sufficient information on Triasulfuron to characterize it as practically nontoxic to birds.

Avian reproduction tests are required for an end-use pesticide when birds may be exposed to repeated or continuous residues through persistence, bioaccumulation or multiple applications or if mammalian reproduction tests indicate reproductive hazard. Avian reproduction studies are required since triasulfuron is extremely persistent according to laboratory fate studies.

<u>Species</u>	<u>T.M.</u>	<u>Results</u>	<u>Author</u>	<u>Date</u>	<u>ID Num.</u>	<u>Fulfills Req.</u>
Mallard duck	96.5%	NOEL=1000 ppm	Fletcher	1985	404564-08	yes
Bobwhite quail	96.5%	NOEL=1000 ppm	Fletcher	1986	404564-07	yes

The avian reproduction guideline requirement (71-4) has been fulfilled.

Precautionary Labeling

Based on avian toxicity data, no label statement for birds is required.

Effects on Fish

Three studies in two documents were evaluated under this topic. Three studies were acceptable for use in a hazard assessment.

<u>Author</u>	<u>Date</u>	<u>MRID No.</u>
Rufli	1984	402719-62, 63
Hamaker	1986	404564-13

The minimum data requirements for establishing the acute toxicity to fish are the results from two 96-hour studies with the technical grade material. The studies are to be performed on one coldwater species (preferably rainbow trout) and one warmwater species (preferably bluegill sunfish).

The acceptable acute toxicity studies are presented below:

<u>Species</u>	<u>T.M.</u>	<u>LC50 ppm</u>	<u>Author</u>	<u>Date</u>	<u>MRID NO.</u>	<u>Fulfill Req.</u>
Rainbow trout (<u>Salmo gairdneri</u>)	94.5%	>100	Rufli	1983	402719-62	yes
Bluegill sunfish (<u>Lepomis macrochirus</u>)	94.5%	>100	Rufli	1984	402719-63	yes

The guideline requirement for fish acute toxicity testing (72-1) has been satisfied. Triasulfuron is practically nontoxic to fish.

Data from a fish early life stage test is required if an active ingredient is persistent in water, or chronic exposure is otherwise expected. The fish early life stage test results are shown below.

<u>Species</u>	<u>T.M.</u>	<u>Results</u>	<u>Author</u>	<u>Date</u>	<u>Acc No.</u>	<u>Fulfills Req.</u>
Fathead minnow	96.6%	NOEL> 68.6 ppm	Hamaker	1986	404564-13	partially

The guideline requirement (72-4) has been partially fulfilled because additional data must be provided. This study provides enough information to complete a risk assessment.

Field Testing

Field testing (72-7) may be requested for pesticides expected to transport to and persist in the aquatic environment at hazardous levels. Based on available information, it is unlikely that aquatic field testing to determine effects to fish is required.

Precautionary Labeling

No fish precautionary statement is required.

Effects on Freshwater Invertebrate

Two studies in two documents were evaluated. Both studies were acceptable for use in a hazard assessment.

<u>Author</u>	<u>Date</u>	<u>MRID No.</u>
Rufli	1983	402719-64
Hamaker	1986	404564-12

The minimum requirement to establish the acute toxicity to freshwater invertebrates is a 48-hr aquatic study with the technical material. The preferred test species is Daphnia magna. The acceptable toxicity test is presented below.

<u>Species</u>	<u>T.M.</u>	<u>EC50</u>	<u>Author</u>	<u>Date</u>	<u>MRID. No.</u>	<u>Fulfills Req.</u>
<u>Daphnia magna</u>	94.5%	>100 ppm	Rufli	1983	402719-64	yes

This test fulfills the guideline requirement (72-2) for acute testing with aquatic invertebrates. Triasulfuron is practically non toxic to aquatic invertebrates.

Data from a freshwater aquatic invertebrate life-cycle test are required if an active ingredient is persistent in water. The acceptable life-cycle test is provided below.

<u>Species</u>	<u>T.M.</u>	<u>Result</u>	<u>Author</u>	<u>Date</u>	<u>Acc No.</u>	<u>Fulfill Req.</u>
<u>Daphnia magna</u>	96.6%	NOEL> 105 ppm	Hamaker	1986	404564-12	yes

This test fulfills the requirement (72-4) for an aquatic invertebrate life-cycle test.

Field Testing

Field testing (72-7) may be required for pesticides expected to transport to and persist in the aquatic environment at hazardous levels. Based on available information, field testing for aquatic invertebrates is not necessary.

Precautionary Labeling

No precautionary label statement is required for aquatic invertebrates.

Effects on Estuarine Organisms

Three studies in one document were evaluated under this topic. The studies were partially acceptable.

<u>Author</u>	<u>Date</u>	<u>MRID No.</u>
Surprenant	1987	404569-09, 10, 11

The minimum data requirements to determine the toxicity of a pesticide to estuarine organisms are an acute study with an estuarine species, a shrimp and a mollusc. The tests are presented below.

<u>Species</u>	<u>T.M.</u>	<u>EC50/ LC50</u>	<u>Author</u>	<u>Date</u>	<u>Acc No</u>	<u>Fulfills Req.</u>
Sheepshead minnow	93.4%	>100 ppm	Surprenant	1987	404564-09	yes
Mysid shrimp	93.4%	21.5 ppm	Surprenant	1987	404564-10	partial ¹
Quahog clam	93.4%	56 ppm	Surprenant	1987	404564-11	no ²

These data suggest that triasulfuron is slightly toxic to shrimp and possibly the clam, but practically nontoxic to estuarine fish.

Data from chronic estuarine testing may be required. Available information indicate these data are not necessary for triasulfuron.

Field Testing

Field testing (72-7) may be required for pesticides expected to transport to and persist in the estuarine environment at hazardous levels. Based on available information, field testing for estuarine organisms is not necessary.

Precautionary Labeling

No precautionary label statement is required for estuarine organisms.

¹ Test concentrations not low enough to allow calculation of No Observed Effect Concentration. Study is considered supplemental and is not upgradeable.

² Study is categorized as invalid because raw data were not provided. May be upgradeable if raw data submitted.

Plant Protection

Twelve studies were evaluated under this topic.

<u>Author</u>	<u>Date</u>	<u>Accession No.</u>
Jones	1987	404564-14
Jones	1987	404564-15
Canez	1987	407283-20
Canez	1988	407283-21
Canez	1987	407283-22
Canez	1988	407283-23
Rufli	1984	407283-24
Hughes	1985	407283-25
Hughes	1985	407283-26
Hughes	1986	407283-27
Hughes	1986	407283-28
Hughes	1986	407283-29

The minimum nontarget plant data required for herbicides applied to both terrestrial food and nonfood sites are Tier I seed germination/seedling emergence, vegetative vigor, and aquatic plant growth testing.

The following Tier II terrestrial studies are acceptable for use in a hazard assessment:

<u>Test</u>	<u>Species</u>	<u>% AI</u>	<u>gm/h EC25</u>	<u>gm/h EC50</u>	<u>Author</u>	<u>Date</u>	<u>MRID No.</u>	<u>Fulfills Guideline Requirement</u>
Germ.	Soybean	93.9	19.5a ✓	254.0a	Canez	1987	407283-21	Yes
	Lettuce		6.91a ✓	64.8a				
	Carrot		2.81a ✓	62.6a				
	Tomato		10.1a ✓	1072.0a				
✓	Cucumber		0.21a ✓	5.93a				
	Cabbage		4.56a ✓	35.3a				
	Oat		>160.0a ✓	>160.0a				
	Ryegrass		1.28a ✓	26.3a				
	Corn		238.0a ✓	2635.0a				
✓	Onion		0.05a ✓	10.1a				

SG

<u>Test</u>	<u>Species</u>	<u>% AI</u>	<u>gm/h</u> <u>EC25</u>	<u>gm/h</u> <u>EC50</u>	<u>Author</u>	<u>Date</u>	<u>MRID No.</u>	<u>Fulfills</u> <u>Guideline</u> <u>Requirement</u>
	Emerg. Soybean	93.9	0.602b	7.25b	Canez	1987	407283-21	Yes
SE	✓ Lettuce		0.095c	0.722c				
	Carrot		0.7c	3.0b				
	Tomato		1.61c	4.0b				
	Cucumber		2.06c	13.8c				
	Cabbage		0.704c	2.19b				
	Oat		26.5c	73.9c				
	Ryegrass		1.04c	2.83c				
	Corn		1.7b	4.74b				
	✓ Onion		0.187c	1.83c				
		<u>Vigor Soybean</u>	<u>93.9</u>	<u>0.481b</u>	2.05c	Canez	1987	407283-23
VG Vegetative Vism	✓ Lettuce		0.038c	0.079c				
	Carrot		0.281b	0.652c				
	Tomato		0.305b	1.1b				
	Cucumber		0.303b	1.47c				
	Cabbage		0.389b	0.671b				
	Oat		>160.0	>160.0				
	Ryegrass		0.87c	2.52c				
	Corn		<u>2.91b</u>	6.65b				
✓ Onion		<u>0.495c</u>	0.961c					

Parameters: a) radicle length, b) dry weight, and c) plant height. The parameter resulting in the lowest EC value is listed.

The Guideline requirements for Tier II terrestrial plant testing have been satisfied.

The following Tier II aquatic plant studies are acceptable for use in a hazard assessment:

<u>Species</u>	<u>% AI</u>	<u>EC50 mg/l</u>	<u>Author</u>	<u>Date</u>	<u>MRID No.</u>	<u>Fulfills Guideline Requirement</u>
<u>Scenedesmus subspicatus</u>	94.5	0.77a	Rufli	1984	407283-24	Partial*
<u>Selenastrum capricornutum</u>	96.5	0.035a 0.059b	Hughes	1985	407283-25	Yes
<u>Lemna gibba</u>	96.5	0.0006c 0.00019d	Hughes	1985	407283-26	Yes
<u>Anabaena flos-aquae</u>	96.5	2.2a 1.7b	Hughes	1986	407283-27	Yes
<u>Navicula pelliculosa</u>	96.5	>100.0e	Hughes	1986	407283-28	Yes
<u>Skeletonema costatum</u>	96.5	31.0a	Hughes	1986	407283-29	Yes

* Initial cell count excessively high.

a MSC (maximum standing crop) in cells/ml

b MSC in mg/l

c dry wt

d frond count

e highest concentration tested

The Guideline requirements for Tier II aquatic plant growth testing have been satisfied.

Effects on Beneficial Insects

No studies were evaluated under this topic. The minimum data required to establish the acute toxicity to honey bee is an acute contact LD50 study with the technical material. As no data are available, the requirement for acute toxicity testing with honey bees has not been fulfilled.

Precautionary Labeling

Labeling is deferred pending receipt of data from a honey bee acute contact study.

Triasulfuron Ecological
Effects Disciplinary Review

I. Ecological Effects Profile

A. Manufacturing Use

1. Avian Studies

The avian acute oral LD50's of >2150 mg/kg (Mallard and Bobwhite, Fletcher, 1984) and the avian dietary LC50's of >5000 ppm for Bobwhite quail and Mallards (Fletcher, 1984) indicate that Triasulfuron is practically non-toxic to birds. The avian reproductive NOEL for mallards and bobwhite is 1000 ppm. No reproductive effects were seen at that (the highest) test level (Fletcher, 1985 and 1986).

2. Aquatic Studies

The fish LC50's for Rainbow trout and Bluegill are both greater than 100 ppm (Rufli, 1983 and 1984). This indicates that triasulfuron is practically non toxic to fish. The early life stage chronic NOEL for Fathead minnow is 68.6 ppm (highest level tested), (Hamaker, 1986).

The LC50 of >100 ppm for Daphnia magna (Rufli, 1983), indicates that Triasulfuron is practically nontoxic to aquatic invertebrates. The aquatic invertebrate life-cycle NOEL is 105 ppm (highest level tested) Daphnia magna (Hamaker, 1986).

3. Mammal Studies

The rat acute oral LD50 is >5000 mg/kg. This indicates that Triasulfuron is practically nontoxic to mammals.

A rat 2-generation reproduction test resulted in a reproductive NOEL of >5000 ppm and a parental NOEL of 1000 ppm. In a rat teratology study, the maternal NOEL was 100 mg/kg and the developmental NOEL was 300 mg/kg. These studies show that triasulfuron is unlikely to have chronic or reproductive effects.

B. Formulated Product

No tests with formulated products are required nor have any been provided.

C. Plant Studies

Tier II-Seed germination/seedling emergence test. Canez (1988, Accession No. 407283-21) reported EC₅₀ values (gm/h), using radicle length as the indicator of 2635 corn, 1072 tomato, 254 soybean, 64.8 lettuce, 62.6 carrot, 35.3 cabbage, 26.3 ryegrass, 10.1 onion, and 5.93 cucumber. Oat was not adversely affected at the 160 gm/h rate.

Seedling emergence data, based on seedling height, resulted in the following EC₅₀ values (gm/h): oat 73.9, tomato 16.7, soybean 14.0, cucumber 13.8, corn 8.95, carrot 6.57, ryegrass 2.83, cabbage 2.38, onion 1.83, and lettuce 0.722.

Using dry weight as the parameter the values were: oat 201, cucumber 15.6, ryegrass 7.28, soybean 7.25, corn 4.74, tomato 4.0, carrot 2.99, onion 2.74, cabbage 2.19, and lettuce 0.864.

Tier II Vegetative vigor test. Canez (1988, Accession No. 407283-23) reported EC₅₀ values, using plant height and dry weight, for ten plant species. EC₅₀ values (gm/h) for plant height were as follows: corn 13.8, ryegrass 2.52, tomato 2.35, soybean 2.05, cucumber 1.47, cabbage 1.47, onion 0.961, carrot 0.625, and lettuce 0.079. Oat was not affected.

For dry weight, EC₅₀ values were: corn 6.65, ryegrass 3.94, soybean 2.29, cucumber 1.82, onion 1.61, tomato 1.10, carrot 0.842, cabbage 0.671, and lettuce 0.110. Oat was not affected.

Tier II-Aquatic plant growth test. Rufli (1984, Accession No. 407283-24) using the alga Scenedesmus subspicatus reported a 5-day EC₅₀ of 0.77 mg/l. Hughes (1985, Accession No. 407284-25) reported a 12-day EC₅₀ of 0.035 mg/l for Selenastrum capricornutum based on MSC in cells/ml and 0.059 mg/l based on MSC in mg/l.

Hughes (1985, 407283-26; 1986, 407283-27; 1986, 407283-28, 1986, 407283-29) also tested the toxicity of the technical material on Lemna gibba, Anabaena flos-aquae, Navicula pelliclosa, and Skeletonema costatum. EC₅₀ values in mg/l were 0.0006 (dry wt) and 0.00019 (frond count) for L. gibba; 1.7 (MSC in mg/l) and 2.2 (MSC in cells/ml) for A. flos-aquae; >100.0 for N. pelliclosa; and 31.0 (MSC in cells/ml) for S. costatum.

II Ecological Effects Hazard Assessment

A Use

Triasulfuron is proposed for use as an herbicide on turf grass, noncrop areas (use category B), wheat and barley (use category A). Trump is the formulation proposed to be used on turfgrass etc. Amber is the formulation proposed for wheat and barley. Both are water dispersible granules containing 75% ai.

Noncrop areas were described as including fencerows, highway rights-of-way, industrial sites, lumberyards, petroleum tank farms, pipeline rights-of-way, plant sites, railroads, storage areas, and utility rights-of-way.

B Environmental Fate

The following environmental fate and chemistry information was taken from an EAB (now EFGWB) review dated Dec 7, 1987. Other data have been submitted, but will not have been reviewed in time for preparation of this document.

Molecular weight: 401.83

Vapor pressure (20°C): 7.5×10^{-13} Torr

Solubility (20°C): 5 ppm (pH 2.5)

40 ppm (pH 5)

1500 ppm (pH 7)

Octanol/Water Partition Coefficient (log P): -0.96

pK_a value: 4.5 (acid)

Hydrolysis: Calculated halflives at 20°C

31.3 days - pH 5

3.1 years - pH 7

3.7 years - pH 9

Soil Metabolism: In silty loam halflife based on phenyl-ring labeled CGA-131036 (triasulfuron) was 15 weeks. With triazine-ring labeled CGA-131036, halflife was 9.5 weeks.

Mobility: Triasulfuron is classified as mobile, with high solubility and low binding potential.

Summary: It would seem that triasulfuron will persist for weeks or possibly years in various compartments of the terrestrial or aquatic environment. Further, it has the potential to transport from one compartment to another and possibly move great distances from treatment areas.

C. Manufacturing-Use

The EEB does not perform a hazard assessment for manufacturing of pesticides.

D. End-Use Product

Trump and Amber are both 75% granulars. However, these granules are dispersed in water and then applied as a spray. The proposed use rates are 1.14 oz/acre (0.0534 lb. ai/acre) for Amber on wheat and barley and 1 oz/acre (0.0469 lb. ai/acre) for Trump on turfgrass and noncrop areas. Ground spray only is permitted.

1. Terrestrial

The maximum application rate is 0.0534 lb. ai per acre. At this rate, the following residues (ppm) are expected on terrestrial food items.

	<u>Short</u> <u>grass</u>	<u>long</u> <u>grass</u>	<u>leafy</u> <u>crops</u>	<u>insects</u> <u>forage</u>	<u>seed</u> <u>Pods</u>	<u>Fruit</u>
maximum	13	6	7	3	<1	<1
typical	7	5	2	2	<1	<1

The maximum residues following one application do not exceed the avian LC50 values of >2150 ppm (mallard and bobwhite, Fletcher, 1984). Acutely, these residues are not likely to affect mammals, assuming an LD50 of 5000 mg/kg.

The maximum levels do not exceed the mammalian 1-generation reproduction NOEL of 1000 ppm. Neither do they approach the 1000 ppm NOEL for mallards and bobwhite (Fletcher, 1985 and 1986).

Adverse effects to terrestrial organisms are unlikely.

2. Aquatic

The first step in assessing hazard to aquatic organisms is to calculate the maximum concentration in 6 inches of water from direct application. This is considered a worst case scenario, and if this concentration does not represent a hazard, no further assessment is needed and the EEB can conclude safety from application to terrestrial sites such as wheat or turf use.

If 0.0534 lb. ai/acre is applied directly to 6 inches of water, the resulting concentration is 39 ppb.

Estimated maximum concentration in 6" = 39 ppb

This is substantially lower than the acute LC50's for rainbow trout and bluegill sunfish (>100 ppm, Rufli, 1983 and 1984) and sheepshead minnow (>100 ppm, Surprenant, 1987). It is also lower

than the fathead minnow early life stage test NOEL of 68.6 ppm. Adverse acute and chronic effects to fish are unlikely.

This is also lower than the Daphnia magna LC50 of >100 ppm (Rufli, 1983) and the Daphnia magna life cycle NOEL of >105 ppm. It is also lower than the shrimp and clam EC50 of 21.5 and 56 ppm (Surprenant, 1987), however, neither of these fulfill guideline requirements.

While additional information is required, including raw data for the Quahog clam study and a repeat of the mysid shrimp study, the available information indicate that there is minimal risk of hazard to aquatic and estuarine organisms from the use of triasulfuron on wheat, barley, turf grass and noncrop areas.

Plants

Triasulfuron may be applied by ground only as a 75% water dispersible granule for control of broadleaf weeds in wheat and barley (Amber™) and for weed control in low maintenance turfgrass and noncrop areas (Trump™). Rate of application ranges from 0.38 to 1.14 oz./A depending on species of weed for Amber™, 0.25 to 1.0 oz/A for use of Trump™ on turf depending on turf grass tolerance, and 0.25 to 3.0 oz/A on noncrop areas with Trump™.

As the labels for both of these herbicides indicate, the potential exists for nontarget plants to be adversely affected if precautionary statements are not followed.

Nontarget plant damage can occur from drift, volatility, or runoff. Since the herbicide is not volatile (vapor pressure 7.5×10^{-12} mm Hg @ 30 °C), and drift from ground rigs is considered to be minimal, the primary area of concern is runoff.

Triasulfuron has been classified by EFGWB as mobile, with high solubility (1500 ppm, pH 7 @ 20°C), and low soil binding potential. The herbicide also has a soil half-life of 9.5 to 15 weeks in a silty loam. Hydrolysis data indicates a half-life of 3.1 years at pH 7.

Runoff - Aquatic

Assumeing a worst case scenario for Trump™ of 5% runoff into a 1 acre pond 6 feet deep, following application to a 10 acre noncrop site treated at the maximum label rate of 3.0 oz/A (2.25 oz ai/A), 1.125 oz ai would enter the pond. This will result in a water concentration of 0.004 ppm. Since the EC₅₀ for Lemna gibba is 0.0006 ppm (dry wt) and 0.00019 ppm (frond count), the potential exists for certain nontarget aquatic plants to be adversely affected from runoff. Based on this scenario, Tier III aquatic plant growth testing is required.

Runoff from a 10 acre wheat field receiving an application of Amber™ at the maximum label rate of 1.14 oz/A (0.855 oz ai/A), would result in a water concentration of 0.0016 ppm in 6 feet of water. This use pattern would also exceed the EC₅₀ for L. gibba and require testing at the Tier III level.

Runoff - Terrestrial

Using the runoff scenario following application of 3.0 oz/A Trump™, to 10 acres, 78.0 gm could be deposited on soils off site. This value exceeds the EC₅₀'s for 6 of the plant species tested for germination and all of the EC₅₀'s for emergence.

Tier III terrestrial nontarget plant testing is required.

IMPORTANT NOTE: While EEB concludes minimal risk to nontarget organisms (fish, invertebrates, birds, mammals, reptiles and amphibians) based on available toxicity information, it is important that aquatic and terrestrial field dissipation study data be obtained plus aquatic organism accumulation studies. This would allow EEB to determine if the extreme persistence suggested in laboratory fate studies is exhibited in the field and if there is a potential for concentrations of triasulfuron to build up in the environment. Based on the results of these tests, EEB may ask EFGWB for a complete assessment on the extent to which triasulfuron will actually persist in various compartments of the environment (sediment, soil or organisms), and whether subsequent years application will result in buildup or accumulation of residues.

3 Endangered Species

The endangered species triggers are:

<u>Group</u>	<u>Rep. NOEL</u>	<u>LC50</u>
Birds	1000 ppm	1/10th=500 ppm
Mammal	1000 ppm	1/10th=5000 ppm ³
Fish	68.6 ppm	1/20th>10 ppm
Aqu. Inv.	>105 ppm	1/20th>10 ppm

The estimated residues on terrestrial food items do not exceed the mammalian or avian triggers. The estimated concentrations in water do not exceed the aquatic organisms triggers. Therefore, based on estimated concentrations, the use of triasulfuron on turfgrass, noncrop areas, wheat and barley is not expected to adversely affect endangered wildlife or aquatic species.

However, use of triasulfuron on noncrop areas may result in exposure to endangered plant species. Additional phytotoxicity testing (~~122-1 seedling germination/seedling emergence~~) is required to provide additional information on the potential for effects. Formal consultation with the USFWS has been initiated for herbicides used in noncrop areas as part of the noncropland cluster. Labeling restrictions and other mitigating recommendations provided in that biological opinion will likely apply to the triasulfuron use on noncrop areas.

³ Mammal 1-day LC50 of 50,000 was extrapolated from the acute oral LD50 assuming mammals consume 10% of their body weight per day.

III. Precautionary Labeling

A. Manufacturing-Use Product

The following statement is required:

"Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public water unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

B. End-Use Product for Terrestrial Food Crop

The following statement is required:

"Do not apply directly to water or wetlands (swamps, marshes, bogs, and potholes). Do not contaminate water when disposing of equipment washwater or rinsate."

IV Data Requirements (See Table A)

The following data/information are required:

A. The acute shrimp test must be repeated, because a NOEL was not obtained in the first one;

B. The raw data for the Quahog clam study must be provided;

C. The growth (length/weight) data sheets for the freshwater fish early life stage study must be resubmitted, the ones provided were not legible;

D. An acute contact LD50 study with honey bees (141-1) is required.

E. Tier III (124-1,2) terrestrial and aquatic phytotoxicity testing is required;

F. Results from EFGWB terrestrial and aquatic field dissipation studies; and

G. Results from a fish bioaccumulation study (72-6).

TABLE A1
GENERIC DATA REQUIREMENTS FOR TRIASULFURON

Data Requirement	Composition ^{1/}	Use Pattern ^{2/}	Does EPA Have Data To Satisfy This Requirement? (Yes, No or Partially)	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)?
§158.145 Wildlife and Aquatic Organisms					
<u>AVIAN AND MAMMALIAN TESTING</u>					
71-1 - Avian Oral LD ₅₀	TGAI	A,B	yes	40271958	no
71-2 - Avian Dietary LC ₅₀ a. waterfowl	TGAI	A,B	yes	40271961	no
b. upland game bird	TGAI	A,B	yes	40271959	no
71-3 - Wild Mammal Toxicity	TGAI	A,B	no		no ³
71-4 - Avian Reproduction a. waterfowl	TGAI	A,B	yes	40456408	no
b. upland game bird	TGAI	A,B	yes	40456407	no
71-5 - Simulated and Actual Field Testing with Mammals and Birds	TEP	A,B	no		no ⁴

TABLE A1
GENERIC DATA REQUIREMENTS FOR TRIASULFURON (CONTINUED)

Data Requirement	Composition ^{1/}	Use Pattern ^{2/}	Does EPA Have Data To Satisfy This Requirement? (Yes, No or Partially)	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)?
§158.145 Wildlife and Aquatic Organisms					
<u>AQUATIC ORGANISM TESTING</u>					
72-1 - Acute Toxicity Freshwater Fish					
a. warmwater	TGAI	A,B	yes	40271963	no
b. coldwater	TGAI	A,B	yes	40271962	no
72-2 - Acute LC ₅₀ Freshwater Invertebrates					
	TGAI	A,B	yes	40271964	no
72-3 - Acute LC ₅₀ Estuarine					
Fish	TGAI	A,B	yes	40456409	no
Shrimp	TGAI	A,B	partial	40456410	yes ⁵
Mollusk	TGAI	A,B	no	40456411	yes ⁶
72-4 - Fish Early Life Stage and Aquatic Invertebrate Life-cycle					
	TGAI	A,B	partial	40456413	yes ⁷
	TGAI	A,B	yes	40456412	yes footnote
72-5 - Fish full life-cycle					
	TGAI	A,B	no		no ⁴
72-6 - Aquatic Organism Accumulation					
	TGAI	A,B	no		yes ⁸

TABLE A1
 GENERIC DATA REQUIREMENTS FOR TRIASULFURON (CONTINUED)

Data Requirement	Composition ^{1/}	Use Pattern ^{2/}	Does EPA Have Data To Satisfy This Requirement? (Yes, No or Partially)	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)?
§158.145 Wildlife and Aquatic Organisms					
72-7 - Simulated or Actual Field Testing Aquatic Organisms	TEP	A,B	no		no ⁴

- 1 TGAI = Technical Grade Active ingredient; TEP = Typical End-Use Product; ~~Regulation 28-3703~~
- 2 A = Terrestrial Food Crop; B = Terrestrial, Nonfood; C = Aquatic, Food Crop; D = Aquatic Nonfood; E = Greenhouse, Food Crop; F = Greenhouse, Nonfood; G = Forestry; H = Domestic Outdoor; I = Indoor.
- 3 Not currently a requirement.
- 4 This test is not required for triasulfuron.
- 5 Test concentrations not low enough to allow calculation of No Observed Effect Concentration. Study is supplemental and is not upgradeable.
- 6 Study is categorized as invalid because raw data were not provided. Study may be upgraded if raw data is submitted and is acceptable.
- 7 Study is categorized as supplemental. May be upgraded if additional are provided.
- 8 The aquatic organism accumulation study is required because triasulfuron is extremely persistent and will tend to transport from use site via surface runoff. The fish accumulation study normally required by EFGWB will suffice for this study. However, if EFGWB guidelines do not trigger that requirement, EEB requires this bioaccumulation study be conducted with fish (e.g. bluegill).

TABLE A 2

TRIASULFURON GENERIC DATA REQUIREMENTS

Data Requirement	Composition ^{1/}	Use ^{2/} Pattern	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially)	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)? Time
<u>\$158.150 Plant Protection</u>					
<u>Target Area Phytotoxicity</u>					
121-1 - Target Area Testing	TEP	A,B	N/A ^{3/}		No
<u>Nontarget Area Phytotoxicity</u>					
<u>TIER I</u>					
122-1 - Seed Germination/ Seedling Emergence	TGAI	A,B	No ^{4/}		No
122-1 - Vegetative Vigor	TGAI	A,B	No ^{4/}		No
122-2 - Aquatic Plant Growth	TGAI	A,B	No ^{4/}		No
<u>TIER II</u>					
123-1 - Seed Germination/ Seedling Emergence	TGAI	A,B	Yes	407283-21	No
123-1 - Vegetative Vigor	TGAI	A,B	Yes	407283-23	No
123-2 - Aquatic Plant Growth	TGAI	A,B	Yes	407283-24,407283-25,407283-26 407283-27,407283-28,407283-29	No
<u>TIER III</u>					
124-1 - Terrestrial Field	TEP	A,B ^{5/}	No		Yes 24 month
124-2 - Aquatic Field	TEP	A,B ^{5/}	No		Yes 24 month

TABLE A 2

TRIASULFURON GENERIC DATA REQUIREMENTS

Footnotes

- 1/ Composition: TGAI = Technical Grade of the Active Ingredient; TEP = Typical End-Use Product.
- 2/ The use patterns are coded as follows: A = Terrestrial, Food Crop; B = Terrestrial, Nonfood; C = Aquatic, Food Crop; D = Aquatic, Nonfood; E = Greenhouse, Food Crop; F = Greenhouse, Nonfood; G = Forestry; H = Domestic Outdoor; I = Indoor.
- 3/ Not currently a requirement.
- 4/ Submission of Tier II plant data eliminates the need for Tier I plant data.
- 5/ Data are required because of the potential hazard to nontarget plants from runoff.

TABLE A3
GENERIC DATA REQUIREMENTS FOR TRIASULFURON

Data Requirement	Composition	Use Pattern	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially).	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)?
<u>§158.155 Nontarget Insect</u>					
<u>NONTARGET INSECT TESTING - POLLINATORS:</u>					
141-1 - Honey bee acute contact LD50	TGAI	A,B	No		Yes
141-2 - Honey bee - Toxicity of residues on foliage	TEP	A,B	No		Deferred ^{1/}
141-4 - Honey bee subacute feeding study	[Reserved] ^{2/}				
141-5 - Field testing for pollinators	TEP	A,B	No		Deferred ^{1/}
<u>NONTARGET INSECT TESTING - AQUATIC INSECTS</u>					
142-1 - Acute toxicity to aquatic insects	[Reserved] ^{3/}				
142-2 - Aquatic insect life-cycle study	[Reserved] ^{3/}				
142-3 - Simulated or actual field testing for aquatic insects	[Reserved] ^{3/}				
143-1 <u>NONTARGET INSECT</u> thru <u>TESTING-PREDATORS</u> 143-3 <u>AND PARASITES</u>	[Reserved] ^{3/}				

Composition: TGAI = Technical grade of the active ingredient; TEP = Typical end-use product. The use patterns are coded as follows: A = Terrestrial, Food Crop; B = Terrestrial, Non-Food; C = Aquatic, Food Crop; D = Aquatic, Non-Food; E = Greenhouse, Food Crop; F = Greenhouse, Non-Food; G = Forestry; H = Domestic Outdoor; I = Indoor.

- 1/ Deferred pending receipt of data from acute contact study.
- 2/ Reserved pending development of test methodology.
- 3/ Reserved pending Agency decision as to whether the data requirement should be established.