128501
SHAUGHNESSY NO.

2
REVIEW NO.

EEB REVIEW

DATE: IN 11/21/85 OUT 21 JAN 1987

FILE OR REG. NO. 476-EEER, 476-EEEA

PETITION OR EXP. NO.

DATE OF SUBMISSION 11/14/85

DATE RECEIVED BY HED 11/19/85

RD REQUESTED COMPLETION DATE 03/10/86

EEB ESTIMATED COMPLETION DATE 03/03/86

RD ACTION CODE/TYPE OF REVIEW 120

TYPE PRODUCT(S): I, D, H, F, N, R, S Herbicide

DATA ACCESSION NO(S). 250545

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) 1) SC-0224 4-LC

2) SC-0224 Concentrate

COMPANY NAME Stauffer Chemical Company

SUBMISSION PURPOSE Proposed Full Registration of Noncrop Use Herbicide

SHAUGHNESSY NO.	CHEMICAL & FORMULATION	% A.I.
128501	476-EEEA: Sulfosate (SC-0224 4-LC)	40.8%
128501	476-EEEL: Sulfosate (SC-0224 Concentrate)	52.2%

100.0 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The registrant proposes registration of two formulations of a new active ingredient (sulfosate) herbicide for use on noncropland. The proposed labels suggest use on (but does not restrict use to) the following areas: airports, buildings, cemeteries, ditchbanks, dry canals and ditches, fencerows, firebreaks, headlands, parking areas, parkways, roadways, vacant lots, highway rights-of-way (ROW's), pipeline ROW's, railroad ROW's, utility ROW's, lumberyards, mining sites, oil fields, petroleum tank farms, plant sites, storage areas, warehouse lots, forest planting sites, irrigation ditches during noncrop season, ornamental nurseries, and turf and lawn renovation.

100.2 Formulation Information (from proposed label)

1) 476-EEEA: SC-0224 4-LC

Sulfosate (trimethylsulfonium carboxymethyl-aminomethylphosphonate)	40.8%
Inert ingredients	59.2%
	100.0%

4.0 lbs ai/gal

2) 476-EEEL: SC-0224 Concentrate

Sulfosate (trimethylsulfonium carboxymethyl-aminomethylphosphonate)	52.2%
Inert ingredients	47.8%
	100.0%

5.5 lbs ai/gal

100.3 Application Methods, Directions, and Rates

1) SC-0224 4-LC

Proposed rates range from 1/2 to 4 quarts of formulated product (1/2 to 4 lb/ai) per acre, depending on weed species to be controlled. The proposed label permits the following: (1) spray application in 10 to 30 gal/water/A, or in 1 to 2 water/A by controlled droplet application equipment; (2) wiper application, with one part formulation to two parts water; and (3) hand-directed spot application with a solution containing 1 to 3% formulated product.

2) SC-0224 Concentrate

Proposed rates range from 1/3 - 3 quarts of formulated product (0.46 - 4.125 lbs ai) per acre, depending on weed species to be controlled. Application methods and dilutions are as described in #1 above, except that a surfactant of the user's choice is added by the user.

100.4 Target Organisms

Fifty-five weed species are listed on the proposed label.

100.5 Precautionary Labeling

The following are among the label statements proposed by the registrant:

> Do not apply to any body of water. Do not contaminate water by cleaning of equipment or disposal of wastes.
>
> Caution must be taken when applying SC-0224 4-LC to avoid drift or contact with nontarget plants. Such contact may result in plant injury.

101.0 Hazard Assessment

101.1 Discussion

The proposed pesticide use is for all noncropland, with an enormous range of suggested uses (see 100.1). Spray, wiper, and spot application methods are proposed (see 100.3). Aerial application and repeat applications are neither specified nor prohibited on the proposed label.

101.2 Likelihood of Adverse Effects to Nontarget Organisms

Sulfosate technical product is considered slightly toxic to the mallard duck based on acute oral testing (LD_{50} = 950 mg/kg), and practically nontoxic to both the mallard and bobwhite quail, based on 5-day dietary studies (LC_{50} > 5000 ppm). This material is considered practically nontoxic to rainbow trout (LC_{50} = 1800 mg/L) and bluegill sunfish (LC_{50} = 3500 mg/L), and slightly toxic to Daphnia magna (LC_{50} = 71 mg/L). See the August 9, 1983 EEB review (M. Rexrode) for details on the above studies.

Formulated product testing on aquatic organisms, with the present submission, indicates that the tested formulation (SC-0224 4-LC) is 44 to 714X as toxic as the technical material. The formulation is considered "moderately toxic" to all tested aquatic organisms (bluegill sunfish LC_{50} = 4.9 mg/L, rainbow trout LC_{50} = 5.7 mg/L, D. magna LC_{50} = 1.6 mg/L).

Applications of SC-0224 4-LC to noncropland could easily result in direct applications to water. This is particularly true with aerial application to utility ROW's or forest planting sites. It is also true with any application to ditchbanks or irrigation ditches, for example. At the maximum label rate of 4 lb/ai/A, this could result in 2.94 ppm of active ingredient in a treated acre of shallow water or wetland areas (6" water) within a treated area. The proposed label indicates that the formulation contains 59.2% of "inert" ingredients, by weight. Hence, at the maximum application of 1 gal/FP/A, with 4 lb/ai/gal, there would be approximately 5.8 lb of "inerts" or 9.8 lb of FP. In a treated acre of shallow water or wetland (6" water) 9.8 lb/FP/A would result in approximately 7.2 ppm FP. This would exceed FP LC_{50} values for all three aquatic species tested, thus easily meeting Special Review criteria (40 CFR 154.7).

Acute testing with the [redacted] would not affect EEB concerns with use of SC-0224 4-LC (because of FP data). However, such testing is needed to determine if the FP toxicity is due largely to the inherent toxicity of [redacted], or if there is a synergistic effect with the technical material.

EAB's January 21, 1986 review indicates no hydrolysis of sulfosate at pH 5-9. Aqueous photolysis half-lives of PMG (anion portion of sulfosate) are listed by EAB as 14.6 to 77.9 days in this pH range, while for TMS (cation) they are 31.7 days to "stable." Given this hydrolytic and photolytic persistence of sulfosate, as well as potential for repeat applications, there is thus a potential for chronic aquatic exposure with this chemical. To evaluate this exposure would require chronic toxicity data: fish embryolarvae study and invertebrate life cycle study. These tests should be conducted using technical product because of the use pattern and persistence of technical material. They also are required using the SC-0224 4-LC formulation, because of the use pattern, persistence of technical material and [redacted] (V. Nabholtz, OTS, estimates several days to several weeks for the latter; pers. comm. with O. Gutenson), and the acute toxicity of this formulation (i.e., assuming chronic effect levels are lower than acute effect levels, they will be even more likely to be exceeded under the proposed use).

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As an herbicide, SC-0224 4-LC could also have an effect on aquatic plants. Further, OTS indicates that algae are likely to be more sensitive to [redacted] in this formulation than are fish or aquatic invertebrates (V. Nabholtz, pers. comm. with O. Gutenson). Thus, the three Tier I plant protection studies (40 CFR 158.150) are required for full hazard assessment, using this formulation.

Given the extremely low dietary toxicity of sulfosate to birds (LC_{50} > 5000 ppm), it is not expected to pose a hazard to them in the proposed use. SC-0224 4-LC is considered "essentially nontoxic" to honey bees (96-hr LD_{50} > 62.135 ug per bee; A. Vaughan January 8, 1987 review) and thus is not expected to pose a hazard to them.

101.3 Endangered Species Considerations

EEB is expected in FY87 to make a formal request for consultation to the U.S. Fish and Wildlife Service (USFWS) for all registered pesticides labeled for noncrop use. Sulfosate and SC-0224 4-LC are being added to the list of chemicals for which consultation will occur. The USFWS biological opinion to follow will be directly applicable to the proposed use of sulfosate. As a herbicide, sulfosate could pose a hazard to endangered/threatened plant species associated with noncropland. Given the acute toxicity of SC-0224 4-LC, this formulation could also pose a hazard to endangered/threatened aquatic species associated with noncropland.

101.4 Adequacy of Toxicity Data

Studies in the present submission that have not been previously reviewed are as follows:

1. The acute toxicity of SC-0224 4-LC to the bluegill sunfish (Lepomis macrochirus). EPA Accession No. 250545.

Review of this study indicates an approximate LC_{50} of 4.9 mg/L for this formulation. It thus appears that the formulation is approximately 714X as toxic as technical material for the bluegill sunfish. The study is presently considered supplemental for this formulation. It may be upgraded to core for this formulation with confirmation of the photoperiod used in the test and confirmation in writing of the exact composition of the test material (i.e., is June 3, 1983 Confidential Statement of Formula accurate for tested material?).

2. The acute toxicity of SC-0224 4-LC to the rainbow trout (Salmo gairdneri). EPA Accession No. 250545.

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Review of this study indicates an approximate LC_{50} of 5.7 mg/L for this formulation. It thus appears that the formulation is approximately 316X as toxic as technical material for the rainbow trout. The study is presently considered supplemental for this formulation. It may be upgraded, as described above for the bluegill study.

3. The acute toxicity of SC-0224 4-LC to Daphnia magna Straus. EPA Accession No. 250545.

Review of the study indicates an approximate LC_{50} of 1.6 mg/L for this formulation. It thus appears that the formulation is approximately 44X as toxic as technical material for D. magna. The study is presently considered supplemental for this formulation. It may be upgraded, as described above.

4. SC-0224 4-LC acute toxicity to honey bees, T-11186. EPA Accession No. 250545.

Review by A. Vaughan of EEB indicates: "This study is scientifically sound. With a 96-hour LD_{50} greater than 62.135 micrograms per bee, SC-0224 4-LC is considered essentially nontoxic to honey bees. This study fulfills the Guideline requirement for an acute contact toxicity test on honey bees."

101.5 Adequacy of Labeling

For SC-0224 4-LC, the registrant may need to lower application rate, prohibit use in areas that could potentially involve shallow aquatic habitat, and/or adjust formulation (this formulation is far more toxic than the technical sulfosate) to avoid acute hazard to aquatic organisms.

Any noncropland sulfosate label would have to bear labeling to prohibit use in areas of endangered/ threatened plants. Depending on methods chosen by registrant to reduce hazard from the SC-0224 4-LC formulation to aquatic organisms in general, labeling to prevent exposure of endangered/ threatened aquatic organisms may or may not be necessary ("trigger" is 1/10 of that for nonendangered species). Current policy (R. Stevens, pers. comm., 1-20-87) is to await completion of the noncrop cluster, and receipt of Biological Opinion, before specifying endangered species labeling.

In addition to proposed labeling (Section 100.5), any label must also prohibit direct application to wetlands or other aquatic habitat. Such labeling would not alleviate EEB concerns with the toxicity of SC-0224 4-LC, however, since inadvertent direct exposure of such areas under the

proposed use would be virtually inevitable, unless aerial application is prohibited. Full label review of ecological effects must also await completion of remaining data requirements.

102.0 Classification

Depending on the methods chosen by the registrant reduce hazard to aquatic organisms, restricted use classification for SC-0224 4-LC may or may not be appropriate.

103.0 Conclusions

EEB has reviewed the proposed registration of sulfosate for use on noncropland. EEB is unable to complete a full risk assessment [3(c)(5) finding] for this use because pertinent ecological effects and environmental chemistry data are lacking. In order to complete this assessment, EEB requires the following data:

1. Environmental chemistry data as per June 30, 1986 EAB review (to assist in modeling aquatic exposure from application not directly to aquatic habitat);

2. the small difference between the percent ai cited on the proposed SC-0224 4-LC label and that in the 6-3-83 CSF for this formulation should be explained.

3. Additional information regarding the submitted aquatic acute toxicity studies with SC-0224 4-LC (see section 101.4);

4. Fish embryolarvae and aquatic invertebrate life cycle studies with sulfosate technical and SC-0224 4-LC;

5. Tier I Plant Protection studies (40 CFR 158.150), with SC-0224 4-LC; and

6. Acute aquatic studies (using bluegill sunfish, rainbow trout, D. magna) with the SC-0224 4-LC [redacted]

Special Review criteria are met for the proposed noncrop use of the SC-0224 4-LC formulation of sulfosate, based on estimated acute hazard to aquatic organisms (see section 101.2).

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