Shaugh. No. 128501

Date out of EAB: 6/17/87

To: R. Taylor
Product Manager 25
Registration Division (TS-767)

From: Matthew N. Lorber, Acting Program Manager ML
Ground Water Program
Exposure Assessment Branch, HED (TS-769)

Attached, please find the environmental fate review of:

Reg./File No.: 476-EEEL and -EEEA

Chemical: Sulfosate

Type Product: Herbicide

Product Name: SC-0224 Concentrate

Company Name: Stauffer Chemical Co.

Submission Purposes: Field dissipation study protocol

ACTION CODE: 117 EAB #(s): 70714 & 70715

Date In: 6/3/87 TAIS Code: 301

Date Completed: 6/17/87 Total Reviewing Time: .2

Monitoring study requested: /x/

Monitoring study voluntarily: / /

Deferrals To: _____ Ecological Effects Branch

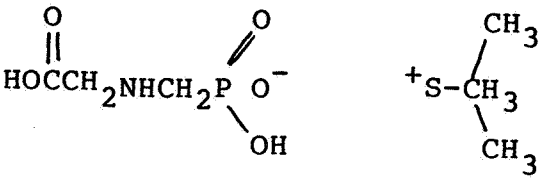
_____ Residue Chemistry Branch

_____ Toxicology Branch

EVALUATION OF FIELD DISSIPATION PROTOCOL

1. CHEMICAL:

Chemical name: trimethylsulfonium carboxymethylaminomethylphosphonate
Common name: sulfosate
Trade name: Touchdown
Structure:



2. TEST MATERIAL:

TOUCHDOWN 4-LC.

3. STUDY/ACTION TYPE:

Evaluation of field dissipation protocol.

4. STUDY IDENTIFICATION:

Title: SC-0224 (Touchdown) 4 LC EPA File Symbol 476-EEEA Field Dissipation Study Protocol
Author: Stauffer Chemical Company
Submitted by: John A. Kieft, Director
Regulatory Affairs
Stauffer Chemical Company
Westport, Connecticut 06880
Study ID No: RP-87-27
Issue Date: June 2, 1987
Accession No: not given
Record No: 197,037/197,038
Identifying No: 476-EEEL and 476-EEEA

5. REVIEWED AND APPROVED BY:

Matthew N. Lorber, Agricultural Engineer Matthew Lorber Date 6/17/87
Environmental Processes and Guidelines Section/EAB/HED

6. CONCLUSIONS:

The protocol submitted is for a field dissipation study, but a field leaching study was required. Although the two types of studies have much in common, there are dif-

ferences. The major one has to do with collection of water samples in addition to soil samples. Because of the differences between the design of the two study types, the submitted study is unacceptable to the Agency.

7. RECOMMENDATIONS:

Transmit this review to registrant and request a resubmission of the protocol. It is further recommended that a meeting be arranged to discuss some of the differences between a field dissipation study and a field leaching study, particularly as they may affect the studies required for registration of sulfosate.

8. BACKGROUND:

An EAB review dated 1/17/86 (EAB # 6084, 6085) evaluated the data requirement for proposed uses of a new herbicide, sulfosate, on non-crop areas. At that time, the recommendation of the reviewer was to submit more mobility testing on aged material, in order to determine the leachability of degradates. Subsequent tests submitted showed that the TMS cation moiety (a primary degradate) was mobile in aged column leaching studies (R_f of 0.54-0.66 in two of three extracts, and K_d less than 1.0, also in two of three extracts). In a letter from R. Taylor dated 4/15/87, the registrants were informed of the remaining requirements for registration of SC-0224 4LC. These requirements were discussed in a meeting with the registrant in the office of Douglas Campt on 4/20/87. Briefly, the concern was still with the leachability of the cation moiety. The informal conclusion reached at that meeting was that more testing was required to fully evaluate the leaching potential of the TMS cation moiety. In a memorandum from Therese Dougherty to Robert Taylor dated 4/30/87, she recommended three studies be submitted, including an aged soil column leaching study on sandy soil, unaged and aged adsorption/desorption with K_d values calculated, and a terrestrial field leaching study. In a letter from R. Tinsworth to R. Riggs on 5/5/87, the requirements for these tests was outlined, including one for a "Terrestrial Field Leaching Study". R. Tinsworth suggested protocols for these field studies be submitted. Finally, in a letter from J. Kieft of Stauffer to R. Taylor dated 5/11/87, these requirements were reiterated, including identification of a terrestrial field leaching study. The protocol being reviewed here was to meet the requirement for a field leaching study. However, it is titled "Field Dissipation Study Protocol", and as well, has design specifications typical of a dissipation study. A major difference between a dissipation and a leaching study is the requirement to obtain water samples in addition to soil samples in a leaching study.

9. DISCUSSION

First, several design features presented in the field dissipation study protocol will be addressed as to their applica-

bility to the leaching study required:

1) The California site is acceptable; the Georgia site is not. A "loamy sand" or "sand" soil is required, rather than the "sandy loam" proposed. Furthermore, information on the location of the saturated zone for both sites is required. For the Georgia site, a "shallow" saturated zone is required, located <25 ft. deep, since wells will be required to be installed for purposes of ground water sampling.

2) Check plot are unnecessary. For both plots, 1000 ft^2 is not large enough. A minimum of greater than 1 acre is required.

3) Application directly to the ground at a rate of 4 lb a.i./ac is appropriate only if it is not normally incorporated. The EAB review dated 1/17/86 (EAB #6085 and 6085) indicates that the proposed use is a direct spray application to weeds.

4) A bare soil leaching study is unacceptable. The registrants will need to conduct the study on proposed use sites (i.e., crops for which the registrants are seeking registrations for sulfosate).

5) Their irrigation proposals are acceptable for both sites.

6) Their soil sampling intervals are acceptable with the following exception: two-month intervals until one year are required after the second month; i.e., sampling dates are also required in month 4, 6, 8, 10, and 12, and six month intervals thereafter, or until the dissipation rate is well defined. The registrants, at their discretion, may validly conclude soil sampling prior to one year. If, for example, the interim soil results indicate that residues are dissipating with a half-life in the range of days, than the two-month requirements can be waived on the basis that complete residue dissipation has occurred. However, the data must support this contention: i.e., the dissipation half-life is well defined, and a sufficient number of consecutive samples (two-three sampling dates) indicate non-detects for residues. Water sampling, however, must continue for a minimum of one year.

7) It is not clear whether the registrant plans to sample to a depth of 48 inches for each sampling date, including pre-treatment and immediately following treatment. It is suggested that the pre-treatment go to 48 inches to insure residue-free soil, but that the immediate post-treatment only go to 24 inches since residues would not be expected to leach immediately after application. Thereafter, the proposal to adjust soil depths on the basis of findings is appropriate. I might caution, however, that with sampling dates at days 3, 7, and 14, there may not be

enough time to analyze samples such that a rational decision be made to go to 48 or 60 inches at these early dates. In other words, should it rain heavily after application, it may be appropriate sample deeper than 24-48 inches although the laboratory may not have analyzed soil samples to show this. The registrant must be made aware that results will be judged "inconclusive" if there are significant residues present in the deepest depth of sampling at any sampling date.

8) Their sampling depth increments are acceptable. One-foot samples are appropriate if it is necessary to go deeper than 48 inches.

9) It is not clear from the protocol (p. 3) exactly how many soil samples will be analyzed each sampling period. The following is acceptable: 4-5 samples per study site per date without compositing. If compositing is desired, than a regime such as 15 samples composited to 3 samples or 16 samples composited to 4 samples is acceptable. What is not acceptable is 5 samples composited to one sample.

10) Sample handling and shipping procedures are acceptable.

11) A detection limit of 10 ppb for the TMS moiety is required. The registrant should be made aware that results of the study must be judged "inconclusive" if this sensitivity is not achieved.

12) Daily weather records including air temperatures, pan evaporation (only if it is readily available at standard weather stations), rainfall, and irrigation totals are required. Weekly summaries are unacceptable.

13) All detail and more, if necessary, as described on p. 5 and 6, is appropriate.

The following additional requirements are imposed in order to sample soil water and saturated zone water:

1) At both sites, suction lysimeters are required to sample unsaturated zone water. A set of three is required, more than one set is recommended only because it is often hard to pull water from lysimeters. The set of three should be near each other (lined up in a row, 3-5 ft from each other) and sampling from three depths before the saturated zone. For example, if the water table is at 15 ft, lysimeters at 4, 8, and 12 feet are appropriate. An acceptable sampling schedule would be once every two weeks, with additional sampling near rainfall events causing unsaturated zone water movement. Sampling should continue for a minimum of one year, with additional sampling if residues are still being noted at the end of one year.

2) Identification of the location of the water table is required for both sites. Since the Southeast site is required to have a shallow water table (< 25 ft deep), wells will be required of this site. Wells should also be placed in the California site if it is shallow. If the site is in the San Joaquin Valley, than it likely would be shallow (or, at least, shallow water tables are not unexpected in this part of California). As a start, three wells should be placed just into the water table prior to study initiation which are to be used to determine the direction of ground water flow. Then, three additional wells, near the initial three and approximately 5 feet deeper, should be placed, also prior to study initiation. Samples should be obtained from three wells at each sampling date. Samples should be at monthly intervals. The three samples should be from the shallower wells, unless they are dry, in which case, the samples should be from the deeper wells. If residues start showing up in the shallow wells, than the deeper wells should also be sampled along with the shallow wells. Sampling should occur at least for one year following application, and longer if residues are still appearing in the wells.

3) All water samples should be analyzed for TMS, CAP and degradates, at a sensitivity level of less than 5 ppb.

The registrants should request a meeting to discuss these leaching study requirements in more detail.