121001

Shaughnessy No.:121001

Date Out of EAB: 7/16/85

To: Don Stubbs
Product Manager 41
Registration Division (TS-767)

From: Samuel Creeger, Chief
Review Section #1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : 85-CO-04

Chemical Name: Sethoxydim

Type Product : Herbicide

Product Name : Poast

Company Name : State of Colorado

Purpose : Sec. 18 emergency exemption - use on onions

Action Code(s): 510

EAB #(s) : 5615

Date Received: 5/22/85

TAIS Code: 51

Date Completed: 7/1/85

Total Reviewing Time: 2.5 days

Deferrals to:

____ Ecological Effects Branch

____ Residue Chemistry Branch

____ Toxicology Branch

1. CHEMICAL:

Sethoxydim, Poast, BAS-9052H, 2-(1-(ethoximino)butyl)-5-(2-ethylthio)propyl-3-hydroxy-2-cyclohexene-1-one

2. TEST MATERIAL:

None

3. STUDY/ACTION TYPE:

The State of Colorado has requested an emergency exemption under FIFRA section 18, to use the postemergent herbicide Sethoxydim to control weeds in onions.

The Colorado Department of Agriculture requests permission to apply up to 6,750 pounds ai to a maximum of 12,000 acres in the Colorado counties of Adams, Bent, Boulder, Crowley, Delta, El Paso, Larimer, Logan, Mesa, Montrose, Morgan, Otero, Prowers, Pueblo and Weld.

Application will be by air or ground equipment at a maximum rate of 0.75 lb ai/A (more typically 3 applications of 0.25 lb ai/a each), in a minimum of 5 to 20 gallons of diluent.

No applications will be made after 8/15/85.

4. STUDY IDENTIFICATION:

Huber, R. 1980. Investigations into the Aerobic Soil Metabolism of NAS 9052 H/NP 55. Laboratory Report No. 1682. Landwirtschaftliche Versuchsstation Limburgerhof, BASF Aktiengesellschaft. February, 1980.

5. REVIEWED BY:

Emil Regelman
Chemist
EAB/HED/OPP

Signature: Emil Regelman

Date: 7/1/85

6. APPROVED BY:

John Jordan
Chief (acting)
Review Section #3, EAB/HED/OPP

Signature: John Jordan

Date: 7/16/85

7. CONCLUSIONS:

All EF data requirements for the proposed use have been satisfied.

However EAB cannot concur with the proposed Section 18 exemption for use of Sethoxydim on onions in the State of Colorado. A rereview of the aged leaching study (in addition to the other physical parameters cited in sections 9 and 10, below) has led EAB to conclude that sethoxydim has a potential to leach, and may reach groundwater under actual use situations.

8. RECOMMENDATIONS:

The registrant should submit additional data from field studies to permit a more complete assessment of the leaching potential of sethoxydim under actual use situations.

9. BACKGROUND:

Introduction

In its review of the aged leaching study (on 11/24/80) cited in §4, above, EAB noted that sethoxydim may tend to leach in some soils. For purposes of the current Section 18 request, EAB has opted to rereview the aged leaching portion of that study (see section 10, below).

The following physical parameters for sethoxydim, when combined with the results of the aged leaching study suggest that sethoxydim's potential to leach in some soils may result in contamination of groundwater:

- o water solubility = 4,700 ppm
- o field persistence > 1 year
- o rate of hydrolysis = 47 days (@ pH 6 and 25°C)
- o K values ≐ 0.3 - 0.7

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

A. Study Identification

Huber, R. 1980. Investigations into the Aerobic Soil Metabolism of NAS 9052 H/NP 55. Laboratory Report No. 1682. Landwirtschaftliche Versuchsstation Limburgerhof, BASF Aktiengesellschaft. February, 1980.

B. Materials and Methods (Protocols)

1. Test Method

a. Description of Protocol, etc.

The aged leaching behavior of BAS 9052 was investigated. Radiolabeled 2-(N-ethoxybutyrimidoyl)-5-(2-ethylthiopropyl)-3-hydroxy-2-cyclohexen-1-one-4-^{14}C was prepared, and found to be >98% pure by TLC and HPLC, with a specific activity of 9.3 mCi/mMol.

Unlabeled (cold) standards were also prepared. A copy of structures is appended to this review.

Soils were a loamy sand and a loam, and were reported to have the following characteristics:

Soil Type	% O.M.	pH	CEC	Bulk Density
Loamy Sand	2.6	6.8	10	1.2

	Percentage				
Soil Type	Particles < 30u	Sand 2000-200u	Sand 200-20u	Silt 20-2u	Clay <2u
Loamy Sand	17	67	16	7	10

NOTE: This table was taken from a copy of the original submission, and reformatted for clarity. Due to the illegibility of the copy reviewed, some of the data in this table may not be correct.

The Loamy Sand was air dried, and 100 gm subsample fortified with 60 mg and thoroughly mixed. Moisture content was adjusted to 40% of maximum water capacity. Soil was aged for 30 days at 22°C in the dark, then added to the top of a 5-segment glass column (5 cm I.D.) containing untreated soil, and leached for 45 days at the guidelines specified rate.

At the termination of the leaching period, the column was segmented, and the soil subjected to analysis by solvent extraction, combustion and LSC quantification.

C. Reported Results

Report table 9, appended, summarizes the cumulative radioactivity found in the leachate. By day 45, a total of 418.5 ug of parent (equivalents) were measured in the leachate, representing approximately 40% of the applied radiomaterial. Distribution of radiomaterial in the various column segments of the loamy sand was as follows:

Segment	1	139.5 ug
	2	182.3 ug
	3	90.3 ug
	4	68.2 ug
	5	61.1 ug
	6	46.7 ug
	7	20.1 ug
Sum		607.9 ug

D. Study Author's Conclusions/Ouality Assurance Measures

Although no comparison was made with other standard materials, the authors concluded that partial leaching of the aged soil residues had, in fact, occurred.

E. Reviewer's Discussion and Interpretation of Study Results

It is apparent from this study that at least moderate leaching of aged sethoxydim residues may be expected to occur in some soil types.

11. COMPLETION OF ONE-LINER:

No additional data have been added to the ongoing one-line data summaries.

12. CBI APPENDIX:

There is no CBI appendix.

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Table 9: Aged leaching experiment, BAS 9052 H/WP 55
^{14}C-residues in loamy sand

Time elapsed since start days	"rain" ml	radioactivity in percolated H_2O /ug (single)	radioactivity in percolated H_2O /ug (cumulative)
1	20.8	29.4	29.4
2	19.3	32.4	61.8
3	21.2	35.5	97.1
4	18.7	21.6	118.7
5	20.8	23.1	141.8
6	21.8	24.3	166.1
7	19.5	16.8	182.9
8	22.5	18.3	201.2
9	22.2	15.3	216.5
10	24.3	16.4	232.9
11	23.4	17.7	250.6
12	24.0	16.2	266.8
13	23.5	14.5	281.2
14	24.3	11.8	293.0
15	24.5	10.5	303.5
16	23.5	8.3	311.8
17	24.2	7.1	318.9
18	23.0	5.8	324.7
19	24.8	5.2	329.9
20	23.0	4.7	334.6
21	24.0	4.7	339.3
22	23.4	4.2	343.5
23	23.2	4.0	347.5
24	23.7	3.9	351.4
25	22.7	3.8	355.2
26	24.7	3.9	359.2
27	22.0	3.5	362.7
28	24.0	3.7	366.4
29	24.0	3.5	369.9
30	22.4	3.4	373.3
31	23.7	3.4	376.7
32	23.0	3.2	379.9
33	24.0	3.3	383.2
34	22.5	3.2	386.4
35	23.8	3.2	389.6
36	23.4	3.1	392.7
37	22.0	2.9	395.6
38	22.0	2.8	398.4
39	24.0	3.0	401.4
40	22.0	2.8	404.2
41	24.0	3.0	407.2
42	24.0	2.8	410.0
43	24.5	2.8	412.8
44	23.5	2.8	415.6
45	24.0	2.9	418.5
Sums	1,034.0 ml	418.5/ug	