D-7892 / LINURON SR 2-12-86

Shaugh. No. 035506

EAB Log Out Date: FEB 12 1986

Init.: SMK

To: I. Sunzenauer
Product Manager 78
Registration Division (TS-767)

Releasable.

From: Carolyn K. Offutt
Chief, Environmental Processes and Guidelines Section
Exposure Assessment Branch, HED (TS-769)

Attached, please find the environmental fate review of:

Reg./File No.: 035506

Chemical: Linuron

Type Product: Herbicide

Product Name: N/A

Company Name: Dupont

Submission Purposes: For the Linuron Data Call In, SRB asked EAB to review its position which intially was to require ground and surface water monitoring

Action Code: 827

Date In: 9/6/85

EFB#: 5909

Date Completed: 2/12/86

TAIS (Level II) Days 10.

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

6 pages.

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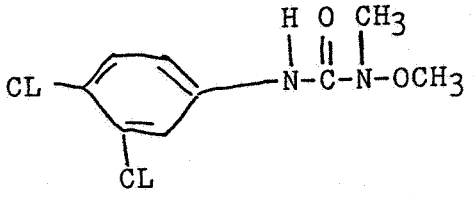
GROUND AND SURFACE WATER MONITORING REQUIREMENTS FOR LINURON

1. CHEMICAL:

Chemical name: 3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea
Common name: Linuron
Structure:



2. TEST MATERIAL:

not applicable

3. STUDY/ACTION TYPE:

Reevaluation of EAB's requirement for ground and surface water monitoring studies for DCI of linuron

4. STUDY IDENTIFICATION:

Title: Data Call In Notice on Linuron for Product Chemistry, Residue Chemistry, and Toxicology
Submitted by: Registration Division/OPP
Report Date: 9/5/85
Identifying No: 035506

5. REVIEWED BY:

Matthew N. Lorber, Agricultural Engineer Date 2/12/86
Environmental Processes and Guidelines Section/EAB/HED

6. APPROVED BY:

Carolyn K. Offutt, Chief Date 2/12/86
Environmental Processes and Guidelines Section/EAB/HED

7. CONCLUSIONS:

Unless new environmental fate data indicate otherwise, linuron does not appear to be a leaching pesticide. Four years (1982-1985) of a comprehensive surface water monitoring program by Dr. Baker of Heidelberg College in Ohio is sufficient for present needs in determining dietary exposure levels in drinking water obtained from surface water, should they be required for the PD 2/3.

8. RECOMMENDATIONS:

A ground water monitoring program is not required at this time. Valid environmental fate data required by the Registration Standard should be submitted and evaluated prior to further decisions concerning a surface water monitoring study. Therefore, the recommendation is to send the DCI letter without requirements for either a surface or ground water monitoring program.

9. BACKGROUND:

On June 29, 1984, EPA issued a Registration Standard for linuron which outlined data gaps, and described the Agency's regulatory position and the Agency's concern over linuron's oncogenic effects. On September 26, 1984, EPA issued a PD 1 which put linuron in special review. On September 5, 1985, the Agency decided to issue a Data Call-In prior to the issuance of a PD 2/3 for additional data to those required by the Registration Standard. A draft Data Call-in letter has been written which states: "EPA is requiring monitoring study to evaluate the manner and extent of contamination of ground and surface water". The registration standard required the following studies which are relevant to ground and surface water contamination concerns: hydrolysis, photodegradation (in water, on soil, and in air), metabolism (soil aerobic and anaerobic), mobility (leaching and adsorption/desorption, lab and field volatility), and soil field dissipation. Du Pont submitted these studies within six months after issuance of the Registration Standard. Most of the submitted studies were invalid, and Du Pont submitted additional information. This additional information was still in review as of 2/1/85. This purpose of this review is to re-evaluate the need for ground and surface water monitoring studies under the DCI.

10. DISCUSSION:

Linuron was left out of the national survey of pesticides in ground water because available information was sufficient to conclude that it would not be likely to leach. A mobility study submitted by DuPont indicates that K_{ads} was 7.1-7.7 for silt loams and 2.7-5.0 for sandy loams. In a combined review of 29 studies submitted by Du Pont (see the Task 2, Environmental Fate and Exposure Assessment, in draft form), the R_f value of linuron was found to decrease with decreasing organic matter. For example, linuron was found to be somewhat mobile, R_f = 0.80, on a sandy loam soil with 0.7% organic matter, but immobile, R_f = 0.13, on a sandy loam with 8.5% organic matter. The range of R_f for linuron on 13 soils was 0.13-0.83, with the high R_f, 0.83, found for a sand soil. Another study showed that R_f on two silt loams was 0.00 and 0.03, and for two sandy loams was 0.04

and 0.11 (range for R_f: 0.00-1.00; higher R_f indicate more leaching). Overall, linuron is considered to have low to intermediate mobility. Since this evaluation led to its exclusion from the national survey, a ground water monitoring program sponsored by the registrant will not be necessary, unless new information contradicts that which is summarized in this paragraph.

However, there is some concern with surface water contamination by linuron. Linuron is persistant in soil, with field half-lives ranging from 1-5 months (from the Task 2, review of 44 studies submitted by Dupont, 15 of which were judged valid). These field studies also showed that linuron residues were generally highest in the top 6 inches of soil. Therefore, the potential for overland transport via eroded sediment or runoff water is high. Data are scarce, however, for linuron in surface water. A search of the STORET data base for linuron only showed one observation (P. Datta, personal communication). However, significant studies were put together by David Baker of Heidelberg College in Tiffin, Ohio, who has been monitoring pesticides in several rivers including the Maumee, Sandusky, Raisin, Melmore, Defiance, and Cuyahoga for 6 years (1980-1985). Monitoring for linuron began in 1982. The four years of linuron monitoring data are summarized in the attached table (Table 1). The area of study is over 80% agricultural, with corn and soybeans as major crops. Therefore, with soybeans as the major use for linuron, this data can be considered appropriate for a typical heavy use site of linuron, and further analysis of the data can provide useful information for a dietary risk assessment, should that be required for the PD 2/3.

The average linuron concentrations presented in Table 1 are averages of positive findings only. An average which considered the non-detects would obviously be much lower. Furthermore, Dr. Baker has taken the majority of his samples during periods of peak concentrations: during and after major storms in spring and summer. Therefore, a "time-weighted" average concentration, which would consider periods of low or absent concentrations (during winter and inbetween spring and summer storms), would be lower still. With these facts in mind, it is noted that comments made during a linuron team meeting (2/10/86) indicated that the average concentrations shown in Table 1 are small in comparison to other routes of dietary intake.

As a final note, it is felt that valid environmental fate studies as required by the registration standard, and further by the DCI letter referenced in this review, should be submitted and and evaluated prior to determining a requirement for surface water monitoring.

Table 1. Summary of linuron surface water monitoring results for 1982-1985 (all results in ppb).

Station	# of samples	Linuron +	mean	max*
I. 1982				
Raisin River	25	12	1.47	2.79
Maumee River	53	28	0.90	2.32
Honey Creek	65	47	3.26	13.12
Sandusky River	51	38	1.40	3.51
Cuyahoga	24	10	3.28	7.34
Lost Creek	51	30	7.16	159.90
Tap Water	5	2	1.23	2.47
Water Treatment Plant	8	8	0.72	1.61
II. 1983				
Maumee River	62	14	0.27	0.39
Sandusky River	58	19	0.38	1.03
Honey Creek	68	31	1.39	4.30
Upper Honey Creek	58	6	0.53	1.22
Rock Creek	46	24	3.00	7.66
Lost Creek	51	17	1.24	4.12
River Raisin	32	7	0.43	0.97
Cuyahoga River	25	3	0.45	1.09
III. 1984				
Maumee River	88	1	1.38	1.38
Sandusky River	79	1	0.42	0.42
Honey Creek	100	5	1.09	1.93
Upper Honey Creek	32	0	0	0
Rock Creek	87	0	0	0
Lost Creek	57	0	0	0
River Raisin	43	1	0.38	0.38
Water Treatment Plant - Tiffin	48	1	0.38	0.38
Fremont	47	0	0	0
Bowling Green	66	0	0	0

*+ = total number of positive samples
mean = mean of positive samples only
max = maximum observed sample for this station

Table 1. (cont'd)

Station	# of samples	Linuron +	mean	max
IV. 1985				
Maumee River	56	2	0.34	0.34
Sandusky River	82	38	0.95	2.23
Honey Creek	120	65	1.86	15.50
Upper Honey Creek	85	8	1.35	3.12
Rock Creek	143	70	2.40	11.33
Lost Creek	63	3	0.28	0.31
River Raisin	31	6	0.94	1.93
Cuyahoga	29	3	2.18	5.05
Black River	37	1	0.26	0.26
Clinton River	40	19	0.77	2.81
Belle River	33	5	0.41	0.96
Pine River	37	0	0	0