File

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Date Out of EAB: JUL 2 1987

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Registration Division (TS-767)

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Hazard Evaluation Division (TS-769C)

Attached, please find the EAB review of...

Reg./File # : 090501

Chemical Name: Alachlor

Type Product : Herbicide

Product Name : Lasso

Company Name : Monsanto

Purpose : Review of rebuttal Comments for Technical Support Document Surface Water and Ground Water

Action Code: 870

Date Received: 6/18/87

Date Completed: 7/02/87

Monitoring study requested: NA

Monitoring study voluntarily: NA

EAB #(s) : 70750

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Total Reviewing Time: 5

Deferrals to:

____ Ecological Effects Branch

____ Residue Chemistry Branch

____ Toxicology Branch

(1)

RESPONSE TO ALACHLOR PD 2/3 REBUTTAL COMMENTS

1. CHEMICAL:

   Common Name: Alachlor
   Trade Name: Lasso
   Chemical Name:
   Structure:

2. TEST MATERIAL: NA

3. STUDY/ACTION TYPE: Response to Technical Support Document Rebuttal Comments.

4. STUDY IDENTIFICATION:

   Listed below are the rebutters to the alachlor Technical Support Document (TSD).

   Entity and Date of Response

   1. City of Akron, Ohio, Department of Public Works, 12/5/86
   2. Monsanto Company, 12/8/86
   3. Natural Resources Defense Council, 1/16/87
   4. National Audubon Society, 1/29/87
   5. Alaska Survival. Talkeetna, AK, 12/15/86

5. REVIEWED BY:

   Harold R. Day
   Chemist
   Environmental Processes and Guidelines Section 7/2/87

6. APPROVED BY:

   Carolyn K. Offutt, Chief
   Environmental Processses and Guidelines Section
   Exposure Assesssment Branch, HED (TS-769) 7/2/87

7. CONCLUSIONS:

   Some conclusions in the TSD may need to be revised, particularly the cost/benefit analysis, the assessment of persistence, and exposure to alachlor through drinking water from surface and ground water sources.

8. RECOMMENDATIONS:

   The comments and responses in 10d be incorporated in the PD 4.

9. BACKGROUND:

On October 8, 1986, EPA announced in the Federal Register a preliminary determination regarding the continued registration of pesticide products containing alachlor and the availability of the Alachlor Technical Support Document (TSD). Comments on the TSD were requested before December 8, 1986. The commenters are listed in (4). The rebuttal comments only address salient comments on surface and groundwater questions.

10. DISCUSSION:

a. Materials and Methods: NA
b. Results: NA
c. Author's Conclusions: NA
d. Reviewer's Comments:

Comments from the five rebutters will be discussed by listing their salient points and offering a response to the rebuttal comments.

1. City of Akron, Ohio

Comment

The City of Akron believes the risks of alachlor use outweigh the benefits. This is based on human exposure, especially applicators without a closed loading system, and increased cost to water treament facilities for removal of alachlor. They also question the Agency assertion that alachlor levels in ground and drinking water sources are low.

Response

Table II-43 in the TSD provides a table of risks based on different levels of alachlor in both ground and surface water (basically drinking water sources). The City of Akron is correct in stating they are concerned about alachlor residues in their water supplies and the cost of producing contaminant-free water. The Agency should take into account the negative impact of increased cost from water treatment to remove alachlor to an acceptable level, particularly in areas with elevated levels of alachlor. Experience indicates that powdered activated carbon achieves (TSD p. II-33) less than 50% alachlor removal; while a granular actived carbon filter achieved significant removal (TSD p. II-33) of alachlor residues. Therefore, reducing alachlor levels is likely to be costly.

2. Monsanto Chemical Company

Comment (General Conditions p. 35)

Monsanto provides a summary on pages 35-36 where it contends alachlor will not leach to ground water if applied according to label directions. They assert the PRZM simulations use incorrect input parameters.

Response

Monsanto overlooks two basic facts. First, alachlor has a water solubility of over 200 ppm under ambient conditions; thus, it could be expected be found in surface water resulting from runoff of areas where alachlor has been applied. Also, this surface water is the basic source of ground water. Second, alachlor has been found in well water and surface water as mentioned in the TSD (pp.II-62 to 80). The current use of alachlor and the finding of alachlor residue levels in surface and ground water demonstrates that, even with current label directions, alachlor still finds its way to surface and ground water and the times of highest alachlor concentrations correlate with seasonal use. Response to the points raised on these pages of the TSD were not sucessfully rebutted.

The input parameters used in the PRZM model assumed 42 days which the rebutter believes is incorrect. The Monsanto rebuttal lists half-life values of about 7-70 days, which are enumerated along with sources. This comment was raised before by Monsanto and rebutted in the TSD (p. II-66). Essentially, the Agency estimate of 42 days takes into account a lower degradation rate when alachlor is below the root zone. Also, as pointed out by the Agency on p. II-32 of the TSD, alachlor residues are found in surface waters two months or longer after application.

Comment

The Agency has misrepresented the meaning of alachlor concentrations found in grab samples by Dr. Baker and others to be an annualized mean concentration (AMC).

Response

The table referred to on p II-32 does not claim to represent the AMC.

Comment

On p. II-33, there is an implication that the Tiffin OH treatment plant uses "activated carbon" treatment.

Response

The Agency agrees and will re-word to make it clear that Tiffin OH does not use powdered activated carbon treatment.

Comment

There is obviously no alachlor where it is not used. Monsanto did find a correlation between watershed use and alachlor concentration.

Response

The Agency agrees with this statement. Obviously, alachlor could not be detected where it was not used unless it is transported by some means. Also, the Agency accepts Monsanto's statement that there is a correlation between alachlor concentration and its use in a watershed.

Comment

Monsanto surface water monitoring data does not support the Agency's estimates for 1-2 ppb level for alachlor in the Mid-West.

Response

The 1-2 ppb Agency estimate is not based on Monsanto data. It is based on mathematical projections from selected river systems in the Mid-West. However, the city of Columbus OH had an AMC in 1985 of 1.4 ppb and an AMC in 1986 (from preliminary data) of 0.57 ppb.

3. Comments from the Natural Resources Defense Council

Comment

EPA should include data from Wisconsin which shows contamination in private wells and at two public facilities.

Response

Although the Wisconsin data were not included in Table 8A of the TSD, the Agency is continuing to collect pertinent data on alachlor in ground water. The data in question are very recent and will be included in future compilation of data on alachlor in ground water.

Comment

Because of current data indicating widespread alachlor contaminatation of ground and surface water, the Agency should immmediately employ every regulatory measure to prevent further contamination.

Response

The Agency is mandated to perform a risk/benefit analysis of actions which would lead to restriction or suspension of alachlor use. Its widespread use as a herbicide is important in crop production, but the occurrence of alachlor in ground and surface water and concomitant risk to the public is of vital concern to the Agency.

The TSD states that there are insufficient data country-wide to perform an adequate assessment of ground water contamination and that the Agency is continuing to collect data to obtain a clear picture of the risk from alachlor contamination of ground water. The Agency plans to continue this effort and will assess the risk to ground water sources. Should ground water levels exceed a maximum acceptable level in particular areas, a way of mitigating this situation may be necessary, such as limiting its use in a particular area.

Existing data on surface water alachlor contamination, as opposed to ground water are more numerous. Surface water data indicate a risk of 2×10^{-6} to 4×10^{-6} which the Agency deems reasonable. The Agency will, in the near future, be promulgating regulations setting a Maximum Contaminant Level (MCL). Should incoming water to treatment plants supplying drinking water in particular areas exceed this level, several options may be considered. These include, but are not limited to, limiting alachlor use in a particular watershed or extensive pretreatment (to reach the MCL) of water before entering the water treatment plant.

Publication of a final decision on alachlor does not mean the Agency will cease monitoring this alachlor contamination problem. Since alachlor is such a widely used herbicide, efforts will continue to assure protection of the public health.

Comment

The TSD states that Monsanto is conducting a study of ground water levels. EPA should provide greater detail in the areas covered, completion date, and preliminary findings.

Response

Recently, Monsanto began a nation-wide ground water monitoring study to determine the level of alachlor in ground water. It is expected to be completed by December 1989. The study is focused on major alachlor-use areas. By law, registrants may claim that studies submitted in support of registration of their products are "Confidential Business Information." Those studies are then not available to the public. However, the Agency may release its assessment of registrant-submitted studies. It is expected that a general assessment and summary of results of the Monsanto ground water survey will be available in early 1990.

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Comment

EPA should discuss in greater detail why spills and disposal are a source of ground water contamination. The Agency claims excessive levels of alachlor have been encountered only when there is a suspect spill.

Response

The concentrations of alachlor (or any pesticide) in the soil associated with a spill or improper disposal are significantly higher than the concentrations in agricultural soil associated with normal use. If a spill occurs near a well, it logically follows that concentrations of residues migrating to the well-head are also higher than residues from normal applications. The Agency has investigated the highest well residues and found them to be results of spills or improper disposals.

To eliminate this problem, the Agency may require a "closed system" when alachlor is used. This will significantly reduce this source of contamination.

Comment

The Agency used the PRZM model for estimating transport of alachlor through the root zone to ground water; however, worst case values were not applied (high application rate), nor would the model reveal channels through soil where application could lead more directly to ground water.

Response

When using the PRZM model, the Agency performs what can be referred to as a "reasonable worst case." By this is meant a simulation of a typical use pattern (typical rate, date, and method of application) in a hydrogeologically-vulnerable setting (sandy soil), when it can be reasonably assumed that this vulnerable setting occurs to some extent. For example, when simulating a specialized use, such as a vegetable crop like artichokes, specific information is obtained on the location and soil types for the crop and used for the PRZM simulation. When simulating a broad use crop, such as corn or soybeans, the assumption is made that the crop is grown to some extent on sandy soils. Such was the case for the Agency's simulation with alachlor. The Agency thinks that it is inappropriate to simulate the "highest rate allowed" on the "worst case hydrogeologic setting."

The contribution of "macropore" transport of pesticide residues is currently the "hottest" research tpoic in pesticide transport to ground water. Although its existence has been verified, it has not been adequately measured. Situations where it would

occur have not been identified and, obviously, it has not been simulated. Research on these questions should provide answers in a matter of years.

Comment

Alachlor is not removed from public drinking water supplies by standard methods thus presenting a public hazard according to the Office of Drinking Water (ODW).

Response

Should the MCL for alachlor (which will be set by the ODW) be exceeded in treatment plant incoming water, the Agency could explore some options to reduce the alachlor level by limiting alachlor use in affected watershed area or requiring treatment of incoming water to meet the MCL.

4. National Audubon Society Comments

Comment

Alachlor contamination of ground water is likely to increase even if its use were eliminated. Studies in Iowa have shown pesticides in ground water are likely to increase over time.

Response

In the case of the Iowa data which the Agency referenced, two years of data on concentrations of alachlor in ground water is too limited a sample to permit prediction of alachlor increases in the future.

In general, cancellation of a pesticide may be followed by increases in well concentrations because there is a lag time between application of a pesticide and appearance of residues in well water. However, by definition, cancellation of a pesticide will eventually result in disappearance of residues. The Agency will watch the situation and carefully monitor future data which may indicate an unacceptable increase in alachlor in ground water.

Comment

There is evidence of year-round alachlor contamination of surface water in Ohio (Binder, 1984).

Response

Data received from D. Binder (City of Columbus OH) does indicate alachlor concentrations are found throughout the year at two different treatment plants. Although alachlor concentrations were higher during the growing season, alachlor was still present

in samples taken in September, October, January, and February at levels around 0.5 ppb. This area (Columbus) has consistently high alachlor levels compared with other locations in the Mid-West according to Monsanto monitoring data. These data are significant because it indicates longer persistence than the Agency had assumed (42 days), and that it may not be proper to assume alachlor levels are negligible at other times of the year. The Agency will consider year-round monitoring to see if this is an isolated case and also consider that assuming negligible values for alachlor during the winter may not be proper in calculating a yearly mean concentratiion.

5. Alaska Survival

Comment

The Agency has classified alachlor as having the potential to leach to ground water. How is this a justifiable classification when it has been found in ground water?

Response

The Agency agrees that alachlor has been found in ground water. The terminology of "potential" means the environmental fate characteristics of a pesticide indicate that it can leach to ground water.

Comment

We do not agree that surface water data on alachlor concentrations in surface water is insufficent.

Response

The Agency has required the registrant to provide extensive monitoring data so the Agency can assess the risk from alachlor in surface waters. This additional data will provide better evidence for all areas of the country, not just selected areas.

Comment

We do not agree that public exposure to alachlor through drinking water is negligible.

Response

The Agency has never stated the presence of alachlor in drinking water was negligible. The levels found have been balanced against the risks and found acceptable for the present. Future data collections, which are in progress, will provide information for continuing reassessment of the risks of alachlor in drinking water.