

US EPA ARCHIVE DOCUMENT

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9 JUL 1981

To: Chief, Ecological Effect Branch
Hazard Evaluation Division

Thru: Chief, Review Section No. 1 ell
Environmental Fate Branch, HED

From: Review Section No. 1
Environmental Fate Branch, HED

Attached find environmental fate information and/or EEC(s) requested for:

Chemical: Aldicarb

Product Name: Temik 10G & 15G

Use Pattern for EEC Calculations: Sorghum, citrus, tomatoes

Date in: 6/23/81

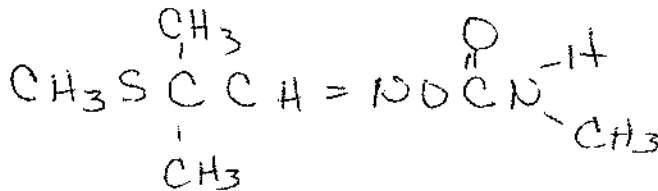
Date out: 9 JUL 1981

EEC/EFP#: 70

1.0 INTRODUCTION

EEB has requested that aquatic environmental concentrations be estimated in ponds for aldicarb (Temik 15G and Temik 10G) for use on citrus and sorghum.

Temik = aldicarb
2-methyl-2(methylthio)propionaldehyde O-(methylcarbamoyl) oxime



2.0 CALCULATIONS

A. An EEC scenario for citrus fruit in Florida was used. The assumptions and inputs to the HR259 program were as follows:

- a) Aldicarb solubility: 0.6% (6000 ppm)
- b) Calculated molecular weight: 190
- c) The % organic matter of pond hydrosol was assumed to be 2, the same as surrounding soil.
- d) As a result of the above inputs, a K_d of 0.6 was calculated.
- e) The application rate is 10 lb ai/acre.
- f) Area treated is 195 A of relatively flat terrain (0.2% slope).
- g) Chemical runoff is estimated to be 1%. Application of granules which are incorporated into soil should not result in a runoff of greater than 1%.
- h) No contribution from drift is expected.
- i) Basin size is 200 acres.
- j) Water runoff of 1 inch is assumed.
- k) Pond area is 2 acres; pond depth is 10 feet.

The HR 259 program calculates the following estimates:

<u>pond water</u>	EEC	<u>pond hydrosol</u>
0.4 ppm		0.2 ppm

- B. An interim EEC scenario for sorghum was used.
- a) The same calculated K_d value determined in A above was used.
 - b) The application rate is 1 lb ai/acre.
 - c) Area treated is 120 acres of rolling terrain (8-10 degree slope).
 - d) The chemical runoff is 1.5%. Application of granules to a rolling terrain may result in a 1.5% chemical runoff during a severe event shortly after application.
 - e) No contribution from drift is expected.
 - f) Basin size is 200 acres.
 - g) Water runoff is assumed to be 1.5 inches.
 - h) Pond area is 2 acres; pond depth is 10 feet.

The HR259 program calculates the following estimates for varying field size:

<u>field size</u>	EEC	
	<u>pond water</u>	<u>pond hydrosoil</u>
20 A	2 ppb	1 ppb
40 A (average)	5 ppb	3 ppb
120 A	14 ppb	8 ppb

- C. EXAMS was used to generate estimation of maximum aldicarb concentration in a stream 5 m wide, 0.75 m deep and a flow rate of 10 CFS for the citrus scenario described above.

EEC	
<u>stream water</u>	<u>stream hydrosoil</u>
5 ppb	3 ppb

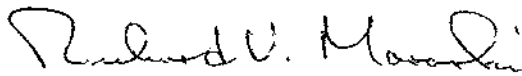
EXAMS was not used to generate estimates to river situations since the dilution factor would significantly reduce levels expected. Estimates for sorghum use were also not generated since estimation generated would be proportionately lower.

4.0 Aldicarb Environmental Fate Summary

Aldicarb, a registered insecticide/nematicide, is currently used on several crops including oranges, sweet potatoes, and sugar beets. In its granular formulation, aldicarb is applied and incorporated 2-3 inches below the soil surface. Aldicarb is stable to hydrolysis at pH 5-7 but proceeds at a faster rate under alkaline conditions with half-lives dependent upon both temperature and pH. Aldicarb degradation in soils is dependent upon soil properties. It is not stable in soils exhibiting coarse texture, low pH, and low moisture. The compound is readily displaced by water and is carried deep into the soil matrix during periods of rain or irrigation.

5.0 CONCLUSIONS

- ° It appears that the level of concern to EEB (~6 ppb) should be met or exceeded in all worst cases except the citrus application.
- ° An EEC was not requested for tomato use. EFB feels the application rate (possible 7 lb ai/acre/year) may contaminate ground water in high water table areas.



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