098301

4-11-85

Shaughnessy #: 098301

Date out of EAB: 4/11/85

Signature: John H. Jordan

To: Ellenberger/ Edwards
Product Manager # 12
Registration Division (TS-767)

From: John H. Jordan, Acting Chief
Registration Standards, Section #3
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached please find the EAB review of:

Reg./File No.: 264-330 264-331 (8824)

Chemical: Aldicarb

Type Product: I

Product Name: TEMIK

Company Name: Union Carbide

Submission Purpose: Data submitted in response to the registration standards including field data & reentry waiver.

ZBB Code:

ACTION CODE: 615

Date In : 7/25/84

EAB # 4470-4471

Date Completed: 3/22/85

TAIS (level II)	Days
42 (includes 8824 & 8825)	12

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

161-2 Photodegradation in Water

Andrawes, N. and R. Meeker. 1976. Photochemical Transformation of Aldicarb, CDL: 096671-F, MRID 00102067.

Conclusions:

This data requirement is satisfied by MRID 00102067 (Andrawes, N. and R. Meeker, 1976, Photochemical Transformation of Aldicarb, CDL: 096671-F) for the following reasons:

1. UC did make an effort to minimize volatilization losses by the use of a water jacketed reation vessel equipped with a condenser and maintained a constant temperature of 20-25°C.

2. Even though the photolysis study at pH 5 shows at day 7, 28% unaccounted for (reported as lost due to volatile unidentified degradates), the same experiment with 2% acetone added as a sensitizer shows only 6% unaccounted for).

162-2 Anaerobic Soil Metabolism

Conclusions:

This study is not required because Union Carbide is doing an anaerobic aquatic study.

162-4 Aerobic Aquatic Metabolism (2 studies)

STUDY 1. MRID 00102048 (study 3, Task 1)

Lynkins, H. and R. Meeker. 1971. Aldicarb pesticide: Stability of aldicarb in water (CDL: 096670-C)

Conclusion:

Though the registrant submitted the missing analytical method, this study would not fully meet the data requirement because the test substance was uncharacterized and there was no pattern of formation and decline of degradates.

STUDY 2. TEMIK Insecticide: Field Evaluation of the Persistence of TEMIK and it Carbamate Metabolites in Pond Water and their effect on Pond Fauna.

In tab 1, Volume 1, Aldicarb Registration Standard 3-month response, TEMIK Aldicarb Pesticide, Environmental Fate Data.

2

Conclusions:

This study is an aquatic field dissipation study submitted with the previous study in response to the aerobic aquatic metabolism data requirement. This data requirement is satisfied. Total aldicarb residues from pure aldicarb added at 3 ppm to a farm pond (pH 6.1 - 6.8) in Clayton, North Carolina dissipated rapidly (t 1/2 about 12 days). Posttreatment pond mud samples on day zero were 0.06 ppm and remained at that level (0.06 - 0.09 ppm) for the six weeks of the experiment.

Materials and Methods:

Pure aldicarb was added through a guaze bag contained in a steel drum to a farm pond and uniformly distributed by a submerged pump. Water and bottom mud samples were taken at daily intervals for the first week and weekly for the following 5 weeks for a total of 6 weeks.

Reported Results:

At 14 days posttreatment, aldicarb residues had declined from 2.8 ppm (day zero) to 1.1 ppm with no rainfall occurring. A total of 7.45 'of rainfall during the 6 week study period, 4.5' falling just after 5 weeks lapsed.

Discussion:

1. Individual degradates were not identified because the colorimetric method used hydrolyzes everything to the corresponding oxime and ultimately converts it to an azo dye.

2. Fish were added to the pond on day after treatment to study the effect of aldicurb residues on aquatic species.

163-1 Leaching (adsorption/desorption)

The requirement for this laboratory study is waived because of the extensive montoring studies and field studies conducted by Union Carbide, and because we know aldicarb leaches from agricultural use.

163-2 Volatility

STUDY 1: Siyak, James R., Allen R. Swoboda and Joe B. Dixon. Volatilization and Degradation Losses of Aldicarb from Soils. J. Environ. Qual. Vol. 6, No. 4, 1977. In Tab 2, Vol 1, Aldicarb Registration Standard 3 month Response TEMIK aldicarb Pesticide, Environmental Fata Data.

Conclusion:

This study does not meet the laboratory volatility data requirement for the following reasons:

1. The study was not run under actual use conditions. An end use product was not used and the application rate was not equivalent to a representative use rate.

2. Trapping efficiency not provided.

3. Zero day sampling not done. Samples were incubated for 24 hours before being attached to the volatilization apparatus.

4. Air concentrations not presented.

Materials and Methods:

Two Texas clay soils were used and maintained either in a dry or humid condition. An air tank was hooked to the soil samples and vapors drawn through and trapped in chloroform-water solutions. A weevil trap was included to test for efficacy.

Reported Results:

At 23°C, more aldicarb was lost from the dry soil than from the moist soil (20 ug versus 16 ug at day 18 for the Beaumont soil and 46 ug versus 9 ug for the Houston Black soil).

Discussion:

1. Volatility data was not expressed as ug/cm^2/hr so the data could be used to assess applicator/worker exposure.

2. Data not expressed as air concentrations (ug/m^3 or mg/m^3) so data can't be used to assess applicator/worker exposure.

STUDY 2:

Spengler, H.T and J.E Griffith. "TEMIK" and "TEMIK" Metabolites Vapor Pressure Data. October 24, 1968. In: Tab 3, Volume 1, Aldicarb Registration Standard 3-Month Response TEMIK Aldicarb Pesticide, Environment Fate Data.

This study measured the vapor pressure of aldicarb and six degradates and is relevant to a product chemistry data requirement, though the vapor pressure is one of the critical parameters considered when deciding whether to impose the laboratory volatility data requirement.

164-1 Field Dissipation Studies for Terrestrial Uses

This data requirement is satisfied. Study 1: Hansen, J.L. and R.L. Jones. Monitoring of aldicarb and Aldoxycarb Residues on North Carolina and Virginia Tobacco Fields July 6, 1984: Tab 1, Volume 2, Aldicarb Registration Standard 3-Month Resonse TEMIK Aldicarb Pesticide Environmental Fate Data.

Conclusions:

This study does not satisfy the field dissipation data requirement (164-1) for tobacco because:

1) No zero day immediate posttreatemnt samples were taken, making it impossible to confirm the application rate and accurately estimate the half-life.

2) If zero day immediate posttreatment samples were taken, then the registrant should supply this information to the agency to meet the data requirement. According to the data tables, sampling wasn't begun until day 24 (No. Carolina) and day 34 (Virginia).

3) The method of sample analysis was referenced but not included with the study.

Material and Methods:

TEMIK 15G was soil incorporated at 3 lb ai/A to a North Carolina sandy loam soil and a Virginia clay loam typical of tobacco growing areas. Pretreatement samples showed no aldicarb residues and tobacco plants were transplanted to the site on the day of application for North Carolina and either on day of application or 4 days later (discrepancy).

Soil core samples to a depth of 3 meters were taken about 1, 2, 4, 6 & 9 months posttreatment. Cores were separated into increments and analyzed. Each treatment plot was divided in 4 subplots and 4 cores taken from each to yield 16 cores for each geographic location.

A GLC method was used with a limit of detection of 5 ppb for all samples except the last interval in Virginia, which were analyzed by HPLC with a limit of detection of 1 ppb.

Reported Results:

Aldicarb residues did not appear to leach below 1.8 m in North Carolina or Virginia.

Estimated half-lives were 39 days (N.C.) and 34 days (VA.)

Discussion:

1. Method not included.

2. Zero day posttreatment samples not included.

3. There do not appear to be any federal registrations for tobacco (there are state registration).

164-1 Field Dissipation Studies for Terrestrial Uses

Study 2: Monitoring of Aldicarb Residues in Michigan and Indiana Tile-Drained Corn Fields. Hansen, J. L. and R. L. Jones. Union Carbide, July 3, 1984. In: Tab 2, Volume II, Aldicarb Registration Standard 3-Month Response TEMIK Aldicarb Pesticide, Environmental Fate Data.

Conclusion:

This study is scientifically valid but since aldicarb is not registered for corn, it is not an appropriate study to fil the terrestrial field dissipation data requirement for currently registered uses listed in the aldicarb registration standard.

Materials and Methods:

Two tile drained corn sites (Indiana and Michigan were treated with 1.68 kg ai/ha of TEMIK 15 G in the spring of 1983. Soil samples were taken at pretreatment, one-half, two and four months posttreatment to a depth of 1.8 m (about 6 ft.). Water samples from the drain effluents and the Maumee River (Indiana) and creeks and ditches in Michigan were taken up to six months posttreatment.

Reported Results:

Detectable aldicarb soil residues (55 ppb limit of detection) were not found below 1.2 m in Indiana and below 0.6 m at the Michigan site. In Michigan, residues declined from 257 ppb at day 17 (0-0.3 m core) to ND at day 130. In Indiana, residues declined from 513 ppb at day 5 to 24 ppb at day 119.

Tile drain samples (Indiana) contained a high of 172 ppb at 19 days posttreatment, declining to ND 4 months after treatment. The Maumee River samples were ND during the 4 1/2 month posttreatment sampling period.

For Michigan, the tile drain samples (sampled for 6 months) showed a high of 10 ppb 41 days after treatment and declined to ND one week later. Creek water samples showed ND during the 2 month sampling period and the ditch showed ND at 2 1/2 months posttreatment and 2 ppb about 6 months after applications.

Discussion:

1. The corn use has been denied by Section 1.

2. The rainfall history was summarized in a general way instead of a daily record being provided.

3. The method was a GC one but was not included or referenced.

164-1 Field Dissipation Studies for Terrestrial Uses

Study 3. Degradation and Movement of Aldicarb and Aldoxycarb Residues in Arizona cotton. Hansen, J. L. and R. L. Jones, July 5, 1984. In: Tab 3, Volume 2, Aldicarb Registration Standard 3-month Response TEMIK Aldicarb Pesticide, Environmental Fate Data.

Conclusions:

Since several pieces of data are missing, this study can not be evaluated for satisfying the field dissipation data requirement.

The missing information includes:

1) Rainfall and irrigation data.

2) The analytical method

Materials and Methods:

Two plots (classified as a loam or sandy loam with pH 8.3 to 9.7) were treated with TEMIK 5 G, each in a different way.

1. 1.12 ki ai/ha at planting plus 2.24 kg ai/ha sidedress 63 days after planting.

2. 2.24 kg ai/ha sidedress 63 days after planting.

Pretreatment samples were taken on April 12, 1983, and showed no aldicarb residues. The granular formulation was applied in bands and the test plots were furrow irrigated throughout the season.

For the application at planting, samples were taken 1, 3, 6, 10, 15 and 22 weeks after planting. For the sidedress treatments, samples were taken 1 week, one and three months after application.

Each plot was divided into 4 subplots and 4 cores were taken from each to yield 16 cores, which were obtained by bucket auger to a depth of 1.8 m (divided into 6 increments), except for the last sampling period, when samples were taken to 3 m.

Reported Results:

Less than 5% of the original aldicarb moved below 1.2 m. The maximum concentration in any sample below 1.8 m was 14 ppb.

The half-life of the aldicarb residue (presumed to be aldicarb, the sulfoxide and sulfone) was 7 days for the treatment at planting, 24 days for the following sidedress treatment, and 15 days for the sidedress only treatment.

The rapid degradation rate appears to be due to high soil pH and temperature.

The table ground water in this region is 100-200 m below the surface.

DISCUSSION:

1. The method was not referenced and only described as a gas chromatography procedure with limit of detection of 5 ppb.

2. Rainfall and irrigation data not presented.

164-1 Field Dissipation Studies for Terrestrial Uses

Study 4: UC Reference: TEMIK Grapes, Section D Residues, UCAPC, File No. 32609, March 14, 1984.

Section 1 Reference: "Use on grapes in CA only", review dated August 31, 1984, reviewed by Samuel M. Creeger, Reg./Files No.: 264-330,-331.

Conclusions: Since this was reviewed by Section 1 previously, a detailed review is not needed. The reviewer concluded that aldicarb residues from the grape use could contaminate ground water in some California counties because some of the irrigation water is recharging the groundwater, despite the presence of a hardpan (personal communication with Mr. Allison of the California Department of Water Resources).

Since grapes are not a federally registered use, this study is not appropriate to satisfy the terrestrial field dissipation data requirement for the registration standard.

164-5 Long Term Soil Dissipation

Since the intent of this data requirement is to study field dissipation for compounds that persist is soil, and since aldicarb dissipates quickly via degradation and, under certain conditions, leaching, this data requirement is waived.

165-1 Rotational Crop

Hersh, D. H., K. P. Sheets. Aldicarb Subsequent crop Residues. April 21, 1977. In: Tab 5, Volume 1, Aldicarb Registration Standard 3-month Respnse TEMIK Aldicarb Pesticide, Environmental Fate Data.

Conclusions: This study satisfies the confined accumulation studies on Rotational Crops data requirement (165-1).

Materials and Methods:

Radiolabelled aldicarb (3 ppm) was added to Norfolk sandy foam. Turnips and barley was planted either 119 days or 1 year after soil treatment. Lettuce was planted 150 days after application.

Soil and plant samples were analyzed by 14C radioassay or for individual residues by GLC flame photometric sulfur detector).

Reported Results:

No residues (limit of detection 0.02 ppm) were detected in the 3 crops planted 1 year after soil treatment.

Negligible residues (0.72 ppm barley straw, <0.02 - 0.14 for lettuce, turnip and barley green plants) were found for the plants harvested 119 days after treatment.

Discussion:

1. Barley was harvested before the grain was fully mature to prevent bird damage.

Reentry Data Requirement

Conclusions:

Union Carbide submitted a waiver request and proposed a label to satisfy this data requirement, which EAB accepted with one minor change.

Attached is the memo from Jim Adams which gives the necessary details.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 21 1984

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Aldicarb Registration-Standard Reentry-Data Requirements

FROM: James D. Adams, Chemist James D. Adams
Exposure Assessment Branch, HED (TS-769)

TO: ~~Herbert Harrison, Chief~~ Jay Ellenberger, PM #12
Insecticides/Rodenticide Branch
Registration Division (TS-767)

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

On July 20, 1984, Union Carbide Co. submitted a letter in response to the Aldicarb Registration Standard Guidance Package. In that letter and one of its attachments, they request that the dermal penetration/reentry data be waived on the basis that their proposed label statement for requirement of protective foot gear will prevent dermal exposure. This memo is a response to their request for waiver of reentry data.

Their proposed label statement [0243G/Pending/12-07-84] provides a warning on page 6 for the use of; "....rubber or neoprene boots and gloves." Since aldicarb is currently only soil incorporated, observance of that warning will obviate agricultural worker exposure to aldicarb residues making the Registration Standard requirement for reentry data redundant. The workers most at risk here would be those who would be performing tasks other than harvesting, who would tend to be non-migrant workers, and who would, therefore, tend to be the most likely to observe the label warnings. The preharvest intervals for aldicarb contained in their label statement are all at least 50 days, so harvesters would not enter treated areas until elapse of a substantial time after pesticide application.

In order to limit the footgear requirement to one season, the first sentence in paragraph 2, page 6 of their proposed label statement [0243G/Pending/12-07-84] should be changed to read, "Do not enter treated area during that growing season without wearing protective footgear." For currently registered aldicarb products, the proposed label statement in conjunction with this wording will provide adequate protection for agricultural workers, and further protective measures are not necessary.