EEB BRANCH REVIEW

DATE: IN ______ OUT ______ (FISH & WILDLIFE)

IN 6/13/77 OUT 9/8/77 (ENVIRONMENTAL CHEMISTRY)

IN ______ OUT ______ (EFFICACY)

FILE OR REG. NO. 1016-69

✓ PETITION OR EXP. PERMIT NO. 6F1849

DATE DIV. RECEIVED 8/10/76

DATE OF SUBMISSION ______

DATE SUBMISSION ACCEPTED 8/18/76 3C1D-2B-Yes

TYPE PRODUCT(S): (I), D, H, F, N, R, S

PRODUCT MGR. NO. Sanders (12)

PRODUCT NAME(S) Temik, Aldicarb

COMPANY NAME Union Carbide

SUBMISSION PURPOSE Added new use on drybeans and soybeans

CHEMICAL & FORMULATION Aldicarb ([2-methyl-2(Methylthio) propion aldehyde O - (merthylcarbamoy) oxime]) (Temik)

1.0 Introduction

1.1 Aldicarb, Temik

1.2 Percent active: 10 and 15 granular products

1.3 Both products registered

10% ai #1016-69
15% ai #1016-78

1.4 Acc # 091372 Vol. 2 of 6, 4 of 6, and 5 of 6.
Acc # 096240 July 1977 Compilation book of above vols.

1.6 See other reviews

PP # 6F1829 8/23/76
1016 EUP 11/4/75

1.7 The registrant is proposing a new use for registration of Temik 10 and 15% granular aldicarb pesticide for use of dry beans and soybeans.

2.0 Directions for use

Dry Beans

1. Amount

Dosages required for aphid control varies from 5 to 7 pounds of TEMIK 15% granular aldicarb pesticide (TEMIK 15G) per acre or 7.5 to 10 pounds of TEMIK 10% Granular aldicarb pesticide (TEMIK 10G) per acre. Based on a 36-inch row spacing, these dosages are equivalent to about 5.5 to 7.5 ounces of TEMIK 15G or 8 to 11 ounces of TEMIK 10G per 1000 linear feet of row.

For control of leafhoppers, Mexican bean beetles, spider mites and nematodes the rates vary from 7 to 14 pounds TEMIK 15G or 10 to 20 pounds TEMIK 10G per acre. Based on the same row spacing these rates are equivalent to 7.5 to 15 ounces TEMIK 15G or 11 to 22 ounces TEMIK 10G per 1000 linear feet of row.

Granules are either drilled in the seed furrow 2 to 3 inches below the seed line or 2 to 3 inches to the side of the row for insect and mite control, or applied in an 8 to 12 inch bank over the row and incorporated in soil 2 to 4 inches deep for nematode control.

2. Frequency and Time of Application

Only one application, at-planting per crop is recommended.

Soybeans

1. Amount

Dosage required for insect control (Mexican bean beetle) ranges from 5 to 10 pounds of TEMIK 15G per acre or 7.5 to 15 pounds of TEMIK 10G per acre. Based on a 36-inch row spacing, these dosages are equivalent to 5.5 to 11 ounces TEMIK 15G or 8 to 16.5 ounces of TEMIK 10G per 1000 linear feet of row. Placement of the granules for insect control is in the seed furrow 2 to 3 inches below the seed line or 2 to 3 inches to the side of the row. Care should be taken not to apply the granules in direct contact with the seeds.

For nematode control (except soybean cyst nematode) the rates vary from 10 to 14 pounds of TEMIK 15G or 15 to 20 pounds of TEMIK 10G per acre. Soybean cyst nematode requires dosages of 14 to 20 pounds of TEMIK 15G or 20 to 30 pounds of TEMIK 10G per acre. Using a 36-inch row spacing as a base, the dosages for control of nematodes (except soybean cyst nematode) are equivalent to about 11 to 15 ounces of TEMIK 15G or 16.5 to 22 ounces of TEMIK 10G per

per 1000 linear feet of row. For control of the soybean cyst nematode the proposed rates are equivalent to about 15 to 22 ounces of TEMIK 15G or 22 to 33 ounces of TEMIK 10G per 1000 linear feet of row. Recommended placement of the granules is in an 8-12 inch bank and worked into the soil or covered with soil to a depth of 2 to 4 inches with the seeds planted in the treated zone.

2. Frequency and Time of Application

Only one application, at-planting per crop is recommended.

2.1 Disposal

Keep out of any body of water. Do not contaminate water when cleaning of equipment or disposing of wastes.

3.0 Discussion of Data

3.1 Physio-chemical degradation

3.1.1 Hydrolysis - data submitted or referenced.

3.1.2 Photodegradation - data not submitted or referenced.

3.2 Metabolism

3.2.1 Aerobic soil - data submitted or referenced.

3.2.2 Anaerobic soil - data not submitted.

3.2.3 Effect of pesticides on microbes - data submitted or referenced.

3.2.4 Effect of microbes on pesticides - data not submitted or referenced.

3.3 Mobility

3.3.1 Leaching - data submitted or referenced

3.3.2 Volatility - data submitted or referenced.

3.4 Field Dissipation

3.4.1 Soil - data submitted or referenced.

3.5 Accumulation

3.5.1 Rotation al crop - data not submitted.

3.5.2 Fish accumulation - data submitted or referenced.

3.6 For evaluation of data submitted see review 1016-69, 78 [6F1829] Oranges. 9/7/77

4.0 General Conclusions

From the data that was presented, a partial assessment of hazards to the environment can be established, a full assessment (scientifically confident) cannot be made without physiochemical (photolysis), and metabolism (pesticides effects on microbes) for this use. We will present whea can be derived from the data presented.

4.1 Hydrolysis:

Temik will hydrolyze at 89° and 100°C, with a 1/2 at pH6 and 8 of 10.0 hrs, 49 mins, 115 mins and 7 mins, respectively. T-sulfoxide and sulfor under the same parameters had t 1/2 of 80 min, 31 min, 20 min, 0.5 min, 120 min, 15 min, 50 min, and <0.5 min. respectively. This study would not support any proposed use because temperatures of 80 and 100° are not indicative of conditions normally found in the field were Temik is applied. No enough data (3 points needed) to extrapolate to lower temperature values. The study was not a material balance study (full extent of rate and decline of parent and formation of degradate cannot be made. Not done in the dark (it has not been established that Temik does not photolyze).

4.2 Metabolism (soil, aerobic):

Tenik will metabolize in clay, fine sand, clay loam, and muck type soils with different pH values (60-80), moisture (3-100%) and organic matter (1-78%) to t 1/2 values from < 1 wk. to 56 days. Ten degradates were found with Temik sulfoxice and sulfane being predominant. The compound exhibits volatility and binding in the soil. Organic matter plays a significant role in the fate of Temik in the soil. A total of three aerobic soil metabolism studies were submitted and these three combined give us an acceptable soil (aerobic) metabolism study. We have a good description of Tenik and its characteristics in soil. This combined acceptable study will support proposed uses in terrestrial and terrestial aquatic (forest) type applications. There is no acceptable aerobic aquatic study and this will not substitute for uses requiring this data (aquatic and aquatic impart uses).

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4.3 Metabolism (Microbial):

Temik does not exhibit microbiocidal effects to the microorganisms tested. This study would not support any proposed use where required (some terrestrial), aquatic, terrestrial/aquatic (forest) and some aquatic impact uses). "Eye ball" methods are not scientifically sound in ennumerating bacterial numbers. Plant pathogens and/or first pollution indicators, which are not indicators of commensal soil populations are unacceptable.

4.4 Mobility (leaching):

The ability of Temik and its degradates to leach depends on the soil type, particularly the organic matter. In muck soil the sulfoxide degradate leached through 7" of soil; loamy type soil parent, sulfoxide, and others leached; in clay type soil the same three leached. The sulfone metabilite did not leach and either is bound or volatilized. Since the leaching studies show Temik and its degradates do leach, we can say that the point is proven. Not all soil characteristics such as pH, CEC, bulk density and percent sand, silt, clay; and an aged study were not submitted (not needed, degradates do leach) we can say that in lieu of these deficiencies, the studies can be used to support proposed uses for terrestrial applications. Since the parent compound and its degradates leach (in sandy type soils) a caution should be taken to the contamination of ground water tables and the food web.

4.4.1 Mobility (volatility):

Temik does volatilize and its rate is dependent upon moisture level of the soil and temperature. The type of soil will play a role on the rate of volatility. These studies were not done under actual use conditions. If Toxicology Branch requires reentry data for Temik, these studies would not support reentry data for the aforementioned reasons.

4.4.2 Field Dissipation (soil):

In the sandy loam soils tested Temik had an extrapolated 1 1/2 of~11 weeks. Temik sulfoxide and sulfone had extrapolated 1 1/2's of~12 wks. These studies give us a rough idea of field dissipation, however, no areas of high organic matter and four agricultural use areas were evaluated, which in soil metabolism showed extremely long half-lives in some cases. Not all characterization of the soils were given including percent sand, silt, clay, organic matter, CEC, and bulk density. These studies would not support any proposed uses for the compound.

4.5 Accumulation (Fish):

Temik at 30 ppm is lethal to bream, large mouth bass, bull frogs and cricket frogs. Temik is lethal to fish up to 10 days after treatment. This study would not support any proposed use because only one exposure system (static) was used. Determinations of residues in whole body, edible tissue and viscera or carcass were not analyzed. Catfish were not used in the static system, radioisotopic techniques, and characteristics of the water were not used for methodology or reported. Pre-application samples were found to contain residues, the validity of the study would be questionable. Temik appears to influence the pH of the water (registrant claims no effect) and pH of water after day 7 was not given. Due to the lethality, rates in water or aging in water may have to be changed to show accumulation.

4.6.3 Ancillary Studies:

Temik is metabolized in plants to primarily the sulfoxide metabolite and unknown #1. A total of 8-10 metabolites were found in plants and 11 in the soil. Activity was uniformly spread throughout the plant. In the greenhouse Temik is soil dependent for mobility and is readily mobile in sand (coarse). Temik sulfoxide was the major metabolite and found in the 6-8" layer of the column. Temik after~1 year in the soil is not lethal to insects. A large amount of activity is lost and is probably due to volatilization. Laying hens were found to have nitrile sulfoxide, oxine sulfane, oxine nitrile, and 13 unknowns in their feces when fed Temik and Temik sulfane. The studies are ancillary. The studies can be used to support any proposed use that is applicable.

4.6.1 Ancillary study:

Special review - substitute chemical program.

All the studies submitted are data that has been previously reviewed, except a study on hydrolysis and oxidation which stated Temik under alkali conditions is hydrolized to oxime, then further by acid to aldehyde. Aldicarb is stated to be oxidized to cildicarb sulfoxide and then to aldicarb sulfone. This is an ancillary data package in some aspects (plant metabolism studies) to give support to appropriate uses.

4.6.2 From our knowledge, experience, and search of pertinent literature; we know that a substantial percentage of dry beans are produced in the eastern area of the U.S. (Michigan & N.Y), with soybeans on states bordering the Mississippi and/or adjacent. The soils in the area are not sandy, but rather, loam, muck, or clay, therefore leaching may not be a problem as for oranges to ground-water contamination. Crops are rotated, and this area of concern will have to be addressed. Reentry is also a concern as in oranges.

5.0 Recommendations:

5.1 We cannot concur with the proposed added use on dry beans and soybeans.

5.2 The following studies were not submitted nor referenced and are required (data gaps):

(1) Photodegradation in soil,

(2) Photodegradation in water,

(3) Aged leaching study,

(a) since other leaching studies slow Temik and its degradates to leach, we do not need an aged leaching study.

(4) Anaerobic soil metabolism study,

(5) Rotational crop uptake study.

5.2.1 Degradation studies are used to determine rates of loss and identification of pesticide resideues which may adversely affect non-target organisms. Pesticides and their degradates may be available to non-target organisms as residues in fish and may contaminate the food web. Hydrolysis and photolysis are two routes of physico-chemical degradation that may effect non-target organisms or be available for uptake in the food web.

Microbial degradation with its biochemical transformations may be of greater impottance than physico-chemical transformation. Microbes are among the most important group of organisms involved in the biochemical transformation of pesticides in soil and sediment. Microbe interaction may affect the availability of pesticides to non-target organisms and accumulation in the food web.

Pesticides introduced in the environment may enter and accumulate in food webs. A study is needed to determine this accumulation and to assess adverse effects on non-target organisms indicated by rotational crops and fish.

5.3 The following studies are not acceptable; their deficiencies are Noted:

5.3.1 Hydrolysis PP 3F414 book 1 Sect. D. June 1973 found in Compilation book for Environmental Chemistry, July, 1977.

(1) Information is needed concerning the lighting conditions in this study; since pesticides are usually susceptible to both hydrolysis and photolysis.

(2) The temperature evaluated of 80° and 100°C, are not conducive with temperatures found in the environmental conditions of pesticide application to the environment.

(3) A material balance study was not submitted. Both degradates formed and pictures of chromatograms were not submitted.

(4) Methodology of this juice analytical procedure U.C. 21149-III-SBF could not be found in the review package.

(5) This study will have to be repeated. Acceptable protocol may be found in sect. 5.44(1). The thin juice analytical procedure UC 21149=III-SFB methodology will have to be submitted.

5.3.2 Microbial Metabolism. APC #091372, Vol. 2 of 6 Tab #13.

(1) Animal or plant pathogens and indications of fecal pollution are unsuitable for microbiocidal or static determinations. They are not commensal organisms found in soil.

(2) Visual enumeration techniques of bacterial growth is unacceptable.

(3) This study will have to be repeated, acceptable protocol can be found in sect. 5.4.4 (4,5).

5.3.3 <u>Accumulation (Fish):</u>

(1) A flow through system was not evaluated.

(2) Radioisotopic techniques not used.

(3) Catfish not used in the static system.

(4) Soil not aged properly (2-4 wks-aerobic conditions) prior to initiation of exposure in the static system.

(5) Determinations of residues in whole body, edible tissue, and viscera or carcass were not analyzed.

(6) Characteristics of the water were not given:

(a) O_2 content

(b) temperature

(7) This study will have to be repeated. Acceptable protocol may be found in Sect. 5.4.4(8).

5.3.4 The following studies combined are an acceptable soil metabilism (aerobic study).

(1) Acc.#091372, Vol. 2 of 6 Tab # 7, pg.2.

(2) Compilation EE data book July 77, II-1

(3) Acc #091372, Vol. 2 of 6 Tab #2, pg. 907.

5.3.5 The following studies combined are an acceptable soil leaching study.

(1) Acc # 091372. Vol. 2 of 6, Tab #9 pg. 4.

(2) Acc # 091372. Vol. 2 of 6. Tab #15.

5.3.6 The following studies are scientifically acceptable, but have deficiences:

5.3.7 Volatility

Acc # 091372. Vol 2 of 6 Tab #9 pg. 4
(1) Not evaluated under actual use conditions.

Acc # 091372. Vol. 2 of 5 Tab #9
(1) Same as above.

Acc # 091372. Vol. 2 of 6 Tab #9 pg. 7
(1) Same as above.

5.3.8 Field Dissipation

A. Acc # 091372 Tab #N Vol. 2 of 6.

(1) Four agricultural use areas were not evaluated, the reported data is only for one.

(2) Samples were not taken to a depth of 12".

(3) Characterization of the soils were not included, texture (percent sand, silt, clay), organic matter, pH, cation exchange capacity, and bulk density.

B. Acc # 091372 Tab #12 Vol. 2 of 6.

(1) Same as above.

(2) Same as above.

(3) Same as above.

(4) No data for discing on residue decline.

(5) No data on plant residue data.

C. Acc # 091372, Vol. 2 of 6, Tab #14.

(1) Same as Above.

(2) Same as above.

(3) Same as above.

5.4 The following questions are asked about environmental chemistry data that need clarrification.

5.4.1 Why is the percent lost in the leaching study greater in non-muck soils, except sand, when other soil studies show the opposite to be true.

5.4.2 In the leaching study with Temik 10-G what happened to the other 96% of the material. Data reported ~1% was leached and ~1-2% remained in the soil.

5.4.3 In volatility studies 50% in study is unaccounted for. A claim is made that they are "NON TOXIC" oximes and nitrile compds. Was this analyzed? What are normal outdoor conditions used for the second study.

5.5 The following descriptions are examples of acceptable protocol for either data gaps and/or data with deficiencies.

1. Hydrolysis. Pesticides may enter natural waters via direct application, mobility from treated areas, industrial discharge, and as a result of disposal and cleanup of containers and equipment. Hydrolysis data are required for all pesticides. Studies are to be conducted in darkness using radioisotopic or other comparable detection techniques at different pH values (acidic, neutral, and basic) at two concentrations and two temperatures. Aliquots in duplicate should be taken at four sampling time intervals, with at least one observation made after one-half of the pesticide is hydrolyzed, or thirty days, whichever is shorter. A material balance (accountability at the completion of an experiment of the pesticide introduced into a defined system including both identified and unidentified products), half-life estimate, and identification of degradation products for the pesticide must be provided. Studies utilizing distilled water provide an upper limit estimate for persistence of pesticides in the acquatic environment. Hydrolysis in natural waters may be carried out to supplement studies in distilled water. Concentrations should approximate use rate and 10 X use rate.

2. Photolysis. Sunlight may destroy or chemically alter pesticides in soil, water, and air. Photodegradation studies in water are required for terrestrial, aquatic, terrestrial/aquatic, and aquatic impact uses (expect for greenhouse and domestic outdoor uses) and uses where pesticides are discharged into wastewater treatment systems. Studies in soil are

required for crop uses and terrestrial/aquatic uses. Studies in vapor phase are required as part of the assessment of reentry hazard. Conduct photodegradation studies using radioisotopic or comparable detection techniques at one concentration (approximately use rate) under natural or simulated [greater than 280 nm (~~280×10^{-9} meters~~) wavelength] sunlight. Such studies must provide a material balance, half-life estimate, and the identification of photoproducts. Rate studies are conducted in distilled or deionized water at pH of maximum stability, and sampling should continue up to twenty percent degradation with sampling for identification of photoproducts to half-life, or thirty days, whichever comes first. Yield of photoproducts may be increased by changing such conditions as wavelengths, concentration, photosensitizers, and solvents other than water. Supplemental rate and photo-product studies may be carried out in natural water for aquatic uses. Studies performed on the soil used in the soil metabolism studies are preferred but other soil textures will be acceptable. The intensity of incident sunlight and time of exposure must be reported if sunlight is used as a source. Information on artificial light sources should contain type of source, intensity, wavelength, and time of exposure.

Photodegradation data must be supported by incident light intensity and percent transmission. Values for intensity in candles per unit area or lambert units are required for artificial light sources. Latitude, time of year, atmospheric cover, and other major variables which affect incident light are to be reported when natural sunlight is used.

Characteristics of water must be reported including pH, temperature, and oxygen content.

3. Anaerobic soil metabolism. This study is required for field and vegetable crop uses to determine differences in rate and patterns of metabolism between aerobic and anerobic soil conditions. Terrestrial anaerobic soil studies should use the same soil as used in aerobic studies. Obtain an aliquot at the thirty day interval from the aerobic soil study, and establish anaerobicity by either waterlogging or purging with inert gases. Preferred sampling intervals are thirty and sixty days after anaerobicity has been established.

   Characterization of soils must be reported including texture (percent sand, silt, and clay) percent organic matter, pH, cation exchange capacity, and bulk density.

4. Effects of microbies on pesticides.. Impact of microbes on pesticide transformation is measured by comparisons of metabolic processes under sterile and non-sterile conditions during a thirty day period. Preferred sampling intervals are 1, 3, 7, 14, 20, and 30 days, but other intervals may be appropriate. Acceptable soil sterilization methods are heat or high energy ionizing radiation. Attempts should be made to identify organisms responsible for degradation. For organisms which are difficult to identify, family names will be sufficient. Isolates that cannot be identified to family level must have descriptive characteristics which can be substituted for generic classification. Alternatively, studies utilizing pure or defined and characterized mixed cultures of bacteria, algae, and/or fungi are adequate.

5. Effects of pesticides on microbes. Data on effects of pesticides on microbes are obtained from studies of effects on microbial functions or microbial populations. Studies of effects on microbial functions constitute a more direct approach, and are preferred to studies of effects on populations. Some effects cannot be measured directly and population studies may be the only recourse. When the functional approach is chosen, data on the effects on nitrogen fixation, nitrification and degradation of cellulose, starch, and protein are required for terrestrial and aquatic uses, and for terrestrial/aquatic uses, an additional pectin degradation study is required. A leaf litter degradation study may be substituted for the cellulose, starch, protein, and pectin degradation studies. When the population approach is chosen, effects on pure or mixed culture populations of representative microorganisms from soil or water or obtained from culture collections should be recorded for terrestrial/aquatic or aquatic uses. Appropriate organisms include free-living, nitrogen-fixing bacteria and blue-green algae such as *Azotobacter*, *Clostridium*, and *Nostoc*, and nitrifiers such as *Nitrosomonas* and *Nitrobacter*. For cellulose, starch, pectin, protein, and similar degradation, include at least one each of soil bacteria, actinomycetes, and molds such as *Bacillus*, *Pseudomonas*, *Arthrobacter*, *Cellulomonas*, *Cytophaga*, *Streptomyces*, *Penicillium*, *Flavobacterium*, *Trichoderma*, *Aspergillus*, *Chaetomium*, and *Fusarium*. Animal or plant pathogens and indicators of fecal pollution are unsuitable.

6. A field dissipation study under actual use conditions is required. Analyses are continued until a ninety percent loss of the pesticide occurs or until patterns of formation and decline of degradation products are

established or to a maximum test duration of eighteen months. Soil samples are taken in increments to a depth of 12 inches from sites in four agricultural use areas. Sampling times include preapplication, day of application, and shortly postapplication. Succeeding samples are dependent upon degradation and metabolism characteristics.

Identification of residues comprising more than ten percent of initial application or 0.01 ppm is needed to construct decline curves of residues in soil.

Characterization of soils must be reported including texture (percent sand, silt, and clay), percent organic matter, pH, cation exchange capacity, and bulk density.

7. Rotational crops. Studies are required to establish if pesticide residue uptake occurs in rotational crops, emergency replanting, or in situations where crops receive water from treated areas. The applicant must identify crops that can be rotated in the proposed use areas. Treat a sandy loam soil with radiolabeled pesticide at a rate equivalent to that expected under actual use conditions. Foblowing treatment, age the pesticide aerobically for a time approximating the anticipated cultural practice; for example, one year for crops rotated the following year, 120 days for crops rotated immediately after harvest, and 30 days for assessing circumstances of crop failure. Plant a root crop, small grain, and leafy vegetable crop at the above times and periodically analyze to maturity. When residues are found, a field study using formulated products shall be undertaken to determine when residues would not oecur in subsequent crops under actual use conditions. A crop residue study under actual use conditions is required for those practices

where a subsequent crop is treated with the same active ingredient as the initial crop. This study is not required for a cover crop is typically plowed under and not grazed. A crop residue study under actual field use conditions is required where water from treated areas, including holding ponds or effluent and other discharges, is typically used to irrigate crops.

Note: Data which are to be reported from field tests include precipitation (accumulated from first application to each sampling), water table, grade (slope), and soil type. In addition, dates of planting and harvesting, application and sampling times; dates and stages of crop and pest development; application-to-harvest and application-to-sampling intervals for each treatment; and the depth, weight, or volume of each sample and the weights and volumes of aliquots taken for analysis must be reported. When water flow is measured in situ, flow meters or comparable techniques are required. (Data in gallons per minue or liters per minute will be acceptable).

Characterization of soils must be reported including texture (percent sand, silt, and clay), percent organic matter, pH, catton exchange capacity, and bulk density.

8. Fish residue accumulation data using radioisotopic or comparable technique are required. Two exposure systems are required: flow-through (with constant concentration of aqueous solution of pesticide) and static (with ambient concentration of residues). Sunfish are preferred in flow-through system and catfish required in the statis system. For the static system treat water overlayering a landy loam soil at the proposed application rate and allow system to "age" for 2 to 4 weeks prior to initiation of fish exposure.

Exposure duration is 30 days with suggested sampling times at 0, 1, 3, 7, 10, 14, 22, and 30 days of exposure; while fish and water samples are taken on 0, 1, 3, 7, 10, and 14 days of withdrawal of exposure. Obtain soil and water samples prior to fish exposure intervals. Determine the amount and identity of the residue in water, soil, whole body fish, edible tissue, and viscera or carcass at each sample interval.

Characteristics of water must be reported including pH, temperature, and oxygen content.

5.6 We defer to Toxicology Branch regarding the significance of volatile products.

1) Laboratory studies show Temik to volatilize depending on soil type (sandy types), temperature, and moisture level, from < 10% to ~50%. Another laboratory study showed that volatiles were identified as Temik sulfoxide, Temik sulfane, and unknown #3.

5.7 We defer to Toxicology Branch as to the need for reentry data requirements. If Toxicology Branch determines that reentry data are needed, then Registration Division will require the following:

a) Soil metabolism

b) Soil dissipation

c) Dislodgeable residues

d) Volatility

e) Photodegradation (vapor phase).

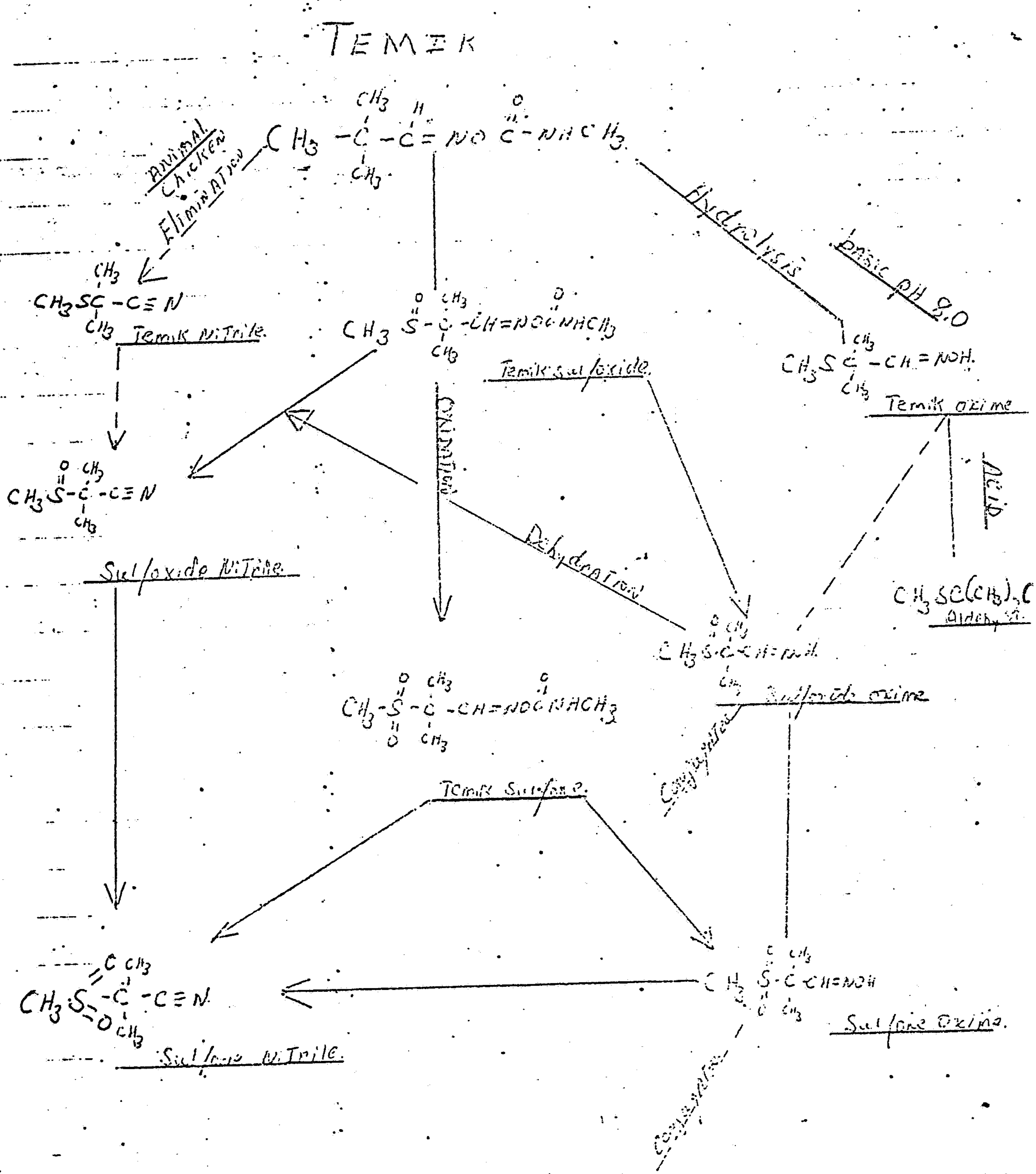
PM Note: We know that other uses are pending for Aldicarb (Field/Veg Crops/Or one) and other data gaps exist for these uses (anaerobic soil metabolism and rotational crop data).

R E Ney 9/23/77

Robert F Carsel 9/23/77

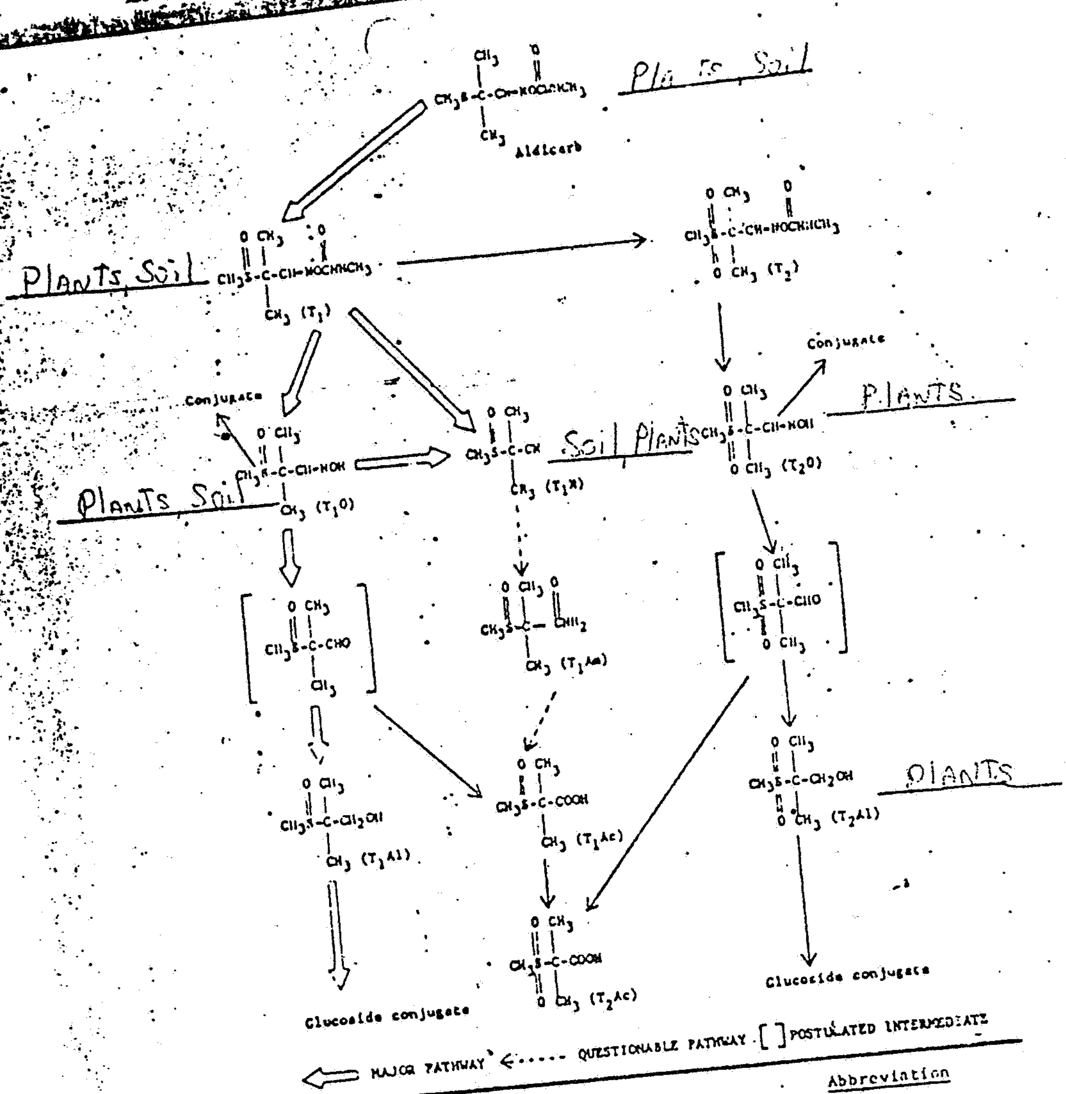
Ronald E. Ney,
Robert F. Carsel
Environmental Chemistry Section
Efficacy and Ecological Effects Branch

Metabolism Charts



UNKNOWNS NOT INCLUDED.

– – – – – – Probable PATHWAY.



Compound	Abbreviation
2-Methyl-2(methylsulfinyl)propionaldehyde O-(methylcarbamoyl)oxime (Aldicarb sulfoxide)	T_1
2-Methyl-2-(methylsulfonyl)propionaldehyde O-(methylcarbamoyl)oxime (Aldicarb sulfone)	T_2
2-Methyl-2-(methylsulfinyl)propionaldehyde oxime (Oxime sulfoxide)	T_1O
2-Methyl-2-(methylsulfonyl)propionaldehyde oxime (Oxime sulfone)	T_2O
2-Methyl-2-(methylsulfinyl)propionitrile	T_1N
2-Methyl-2-(methylsulfinyl)propionamide	T_1Am
2-Methyl-2-(methylsulfinyl)propanol	T_1Al
2-Methyl-2-(methylsulfonyl)propanol	T_2Al
2-Methyl-2-(methylsulfinyl)propionic acid	T_1Ac
2-Methyl-2-(methylsulfonyl)propionic acid	T_2Ac

Source: Barlety et al., op. cit. (1970).