Shaugh. No. 113501

EAB Log Out Date: SEP 30 1986

Init.: SMK

To: H. Jacoby
Product Manager 21
Registration Division (TS-767)

From: Carolyn K. Offutt 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.: 100-601

Chemical: Metalaxyl

Type Product: Fungicide

Product Name: Ridomil

Company Name: CIBA-GEIGY

Submission Purposes: Ground and surface water monitoring studies were voluntarily submitted, although not in response to any registration requirement

Action Code: 400

Date In: 12/13/85

EFB#: 6330

Date Completed: SEP 30 1986

TAIS (Level II) Days

3

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

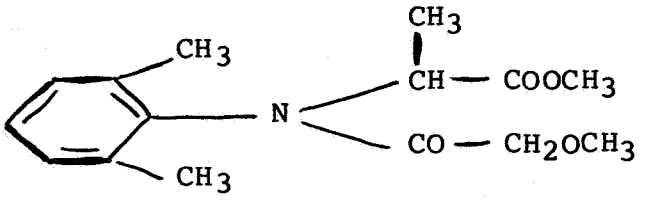
_____ Toxicology Branch

EVALUATION OF GROUND AND SURFACE WATER

MONITORING STUDIES FOR METALAXYL

1. CHEMICAL:

Chemical name: N-(2,6-Dimethylphenyl)-N-(methoxyacetyl)-alanine methyl ester
Common name: Ridomil
Structure:



2. TEST MATERIAL:

not applicable

3. STUDY/ACTION TYPE:

Evaluation of ground and surface water monitoring studies conducted by Ciba-Geigy on Metalaxyl between 1983 and 1985.

4. STUDY IDENTIFICATION:

Title: Ridomil Groundwater Monitoring Study Results During 1983 and 1984 (Accession No. 260857)
Summary of Metalaxyl Surface Water Monitoring for 1983-1985 (Accession No 260856)
Author: K. Balu (groundwater)
R. H. Ross and K. Balu (surface water)
Submitted by: Ciba-Geigy Corporation
Agricultural Division
P.O. Box 18300
Greensboro, NC 27419
Issue Date: Dec. 12, 1985
Identifying No: 100-601

5. REVIEWED BY:

Matthew N. Lorber, Agricultural Engineer Matthew Lorber Date 9/30/86
Environmental Processes and Guidelines Section/EAB/HED

6. APPROVED BY:

Carolyn K. Offutt, Chief Carolyn K Offutt Date 9/30/86
Environmental Processes and Guidelines Section/EAB/HED

7. CONCLUSIONS:

Groundwater monitoring wells in all three locations were inadequately described. Florida results do not address the issue of Metalaxyl leaching to shallow first-encountered aquifers, but rather the possibility of leaching to deep aquifers at >200 feet. Still, 2 of 67 samples showed positive results, 3.1 (confirmed at 3.3) and 4.7 ppb. (also confirmed). For North Carolina and Oregon results, two years of approximately monthly samples from three wells at each location show no positive results, supporting the hypothesis that metalaxyl may not be traversing off-site at this locations. Still, wells were inadequately described (see Discussion Section), and water table depths described at 40-140 ft in Oregon are at the far end of a definition of "shallow" water tables.

Surface water monitoring in the Sacramento River, California, showed seasonal concentrations of metalaxyl in two of three years of bi-monthly sampling. Seasonal, in this context, refers to spring, summer, and fall when runoff typically transports residues of pesticide from the treated field to the surface water. In one year, 61% of seasonal samples were positive with a range of 0.97 to 3.5 ppb, while in the other year of positive results, 50% of seasonal samples showed positive, with a range of 0.25-0.43 ppb.

Samples from tap water which obtained water from the Sacramento River showed no positive residues in three years of sampling.

Surface and ground water monitoring results from these studies are included as attachments to this review.

8. RECOMMENDATIONS:

In the future, evaluation of ground water studies should begin with an evaluation of well selection. If a complete well description is unavailable, then no conclusions or hypothesis can be generated from the data. Important information that must be available include: depth of water table, depth of well screen (and length of well screen, if possible), and proximity to field using the pesticide. Also, some discussion on history of pesticide use on the field and gradient of water table (i.e., direction of ground water flow) with respect to the field and the well is desirable.

Attachments 1 and 2, referenced by CIBA-GEIGY in their report which described in more detail the Florida and Oregon well sites, were not included with this submission and should be obtained from the registrant.

Results of these studies should be retained in EAB files for future reference. High positive results in one well in Florida

used for chemigation illustrate the possibility of high residues remaining in irrigation wells following chemigation.

9. BACKGROUND:

This data was voluntarily submitted in December of 1985 for no specific purpose except, as put by Karen Stumpf of CIBA-GEIGY in the cover letter with these submissions, "These data are submitted to provide the Agency with additional data on the presence of agricultural chemicals in ground and surface water."

10. DISCUSSION

Three wells located on the property of Southern Citrus Nurseries, Inc. in Dundee, Florida, were sampled between 1983 and 1985. A fourth well, in Avon City, was monitored in 1984 and 1985. Information on precisely where the water was being extracted (i.e., well screen depth) was not available. Information provided for the three wells in the Southern Citrus Nurseries include: well depth: 660 - 852 ft, casing depth: 203-231 ft, and static water level: 105-146 ft. For the fourth well in Florida, information provided was that the water table is shallow, 40-50 feet, and that the well depth is 438 ft. It is assumed that the casing depth is the depth to which water samples are extracted for the first three wells, but there is no analagous assumption for the fourth well.

Of 67 samples extracted from the four wells in the three years of study, only 2 showed positive results: 3.1 and 4.7 ppb. Both results were verified. This low frequency of positive results is not unexpected, given the depth of water table, >100 feet, and the depth of water extraction, >200 feet. In another extensive monitoring study of deep wells in Florida in which 800 samples were extracted from approximately 400 deep wells in search of a different leaching pesticide, no positive results were found. The hydrogeology of Florida is such that shallow unconfined aquifers above confined aquifers receive the leaching pesticides, and rural shallow wells tapping the surficial aquifers are the most sensitive. None of the wells sampled for metalaxyl in this monitoring program can be considered rural, shallow wells.

The location of these two sites is above the Floridan Aquifer, the principal aquifer of Florida. In most locations, the Floridan is confined and deep. However, the two sites are, in fact, located in areas of recharge to the Floridan where there isn't any known clay confining layer restricting flow from the surface to the Floridan Aquifer (this information is from a map entitled, "Areas of Natural Recharge to the Floridan Aquifer in Florida", by J.W. Stewart, prepared by USGS, Map Series 98, Tallahassee, Florida). From this perspective, the choice of sites was very appropriate. Still, the monitoring in Florida did not examine the more hydrogeologically sensitive scenario (leaching to shallow surficial

aquifers), and the conclusion on p. 6 of the ground water submission, "Ridomil is not expected to cause adverse effects through movement to the ground water under normal agricultural use conditions" is not warranted for the Florida monitoring.

One well showed unusually high readings of 29-226 ppb Metalaxyl. This was found to be the result of sampling from the injection port of the irrigation well used for chemigation. When sampling through the coolant line of the same well, there were no positive results. The most important use of this data may be to illustrate the possible contamination of well water when chemigation is practiced.

The North Carolina wells were inadequately described. Distance from a treated field was noted at 100-200 feet. However, description of the three wells was inadequate: "The wells are primarily used for irrigation, and the estimated depth of water table in the three wells is 40-50 ft." Water tables do not exist in wells. The water level in the well is roughly equivalent to the depth of the water table if the well is tapping an unconfined aquifer. However, the water level in the well can be much higher than the depth of the water table if the well is tapping a confined aquifer, and artesian pressure forces water up the well. Without more precise information on the three wells, there is no valid conclusion or hypothesis concerning leaching of metalaxyl that can be generated from the North Carolina negative results.

The Oregon well sites were apparently directly on the hops fields in which Metalaxyl was applied for same three years of sampling, 1983-1985 (and not before 1983). However, again, there was no information of well screen depth, but rather estimated water table depth, which was 40-50 ft for one well, 60 ft for another well, and 120-140 ft for the third well. Without knowing precisely where the water samples were extracted, one cannot say that the metalaxyl did not reach the aquifer - only that the metalaxyl did not reach the well screen.

Finally, there was a few minor points of sloppiness in the reporting of data by CIBA-GEIGY, including:

1) Dundee is not in Highlands County, Florida, but rather in Polk County, Florida.

2) The cover letter to these reports inaccurately states, "Results show no detectable residues of metalaxyl at the screening levels of 0.25-1.0 ppb during the entire monitoring period, from May, 1983 - May, 1985". In fact, there were 2 positives of 67 samples in the Florida ground water sampling that were not due to sampling of the chemigation injection port.

3) The "Results and Discussion" section of the report made mention of only one of these two positive results, and the "Conclusions" section, like the cover letter, claimed that there were "no detectable residues of metalaxyl at the screening levels of 0.25-1.0 ppb". The summary table ~~table~~ lists the second positive

result, and the raw data accompanying the report lists this second positive, as well as it's confirmation.

The surface water sampling was conducted in the Sacramento River, one mile from the confluence with the San Joaquin River. Sampling occurred between January, 1983, and July, 1985 in both the river near the river bank where the water was flowing, and out of a tap whose water originated from the river. The tap water never showed positive results. Samples from the Sacramento River did not show positives the first year of sampling, but positives regularly showed up in the spring, summer, and fall months of the next two years of sampling. In the second year, between March and September, 14 samples were taken, 8 were positive with a range of 0.97 to 3.5 ppb and a mean of 1.6 ppb. In the third year, 10 samples were extracted between March and July, 5 were positive with a range of 0.25 to 0.43 and a mean of 0.32 ppb (method sensitivity of 0.25 ppb). It can be concluded that in two of three years of sampling, metalaxyl appeared in surface waters during the spring and summer, most likely a result of surface runoff. Degradation and/or removal of the residues occurred by the time Sacremento River water appeared in the tap.

MATALAXL

Page_____ is not included in this copy.

Pages _ 7 _ through _19__ are not included.

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____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

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____ A draft product label.

____ The product confidential statement of formula.

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