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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

July 21, 2000

MEMORANDUM

SUBJECT: EPA Review of "Assessment of Worker Exposure and Potential Risk for Ornamental and Turf Uses of Etriazole," MRID 436660-01, PC Code # 084701, DP Barcode D266977.

FROM: Gary Bangs
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TO: Roberta Farrell, Chemical Review Manager
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THROUGH: Steve Knizner, Branch Senior Scientist
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PHED: Yes, V1.1

The current submission contains assessments conducted using PHED V1.1 and by translating data from a Uniroyal-submitted study for daminozide exposure. The dermal and inhalation exposure estimates in this study were all based upon median values and "typical worker practices." For non-cancer risk assessments, the HED evaluates worker risk based upon use of the chemical product at maximum label rate. Therefore the exposure estimates in this paper do not meet the standard generally used by HED. However, product usage information provided in this report can be useful to HED in evaluating occupational and non-occupational exposures.

1.0 INTRODUCTION

Uniroyal Chemical Company, the registrant for etridiazole (Terrazole), has submitted a report assessing the exposure of workers to the fungicide. The document, titled "Assessment of Worker Exposure and Potential Risk for Ornamental and turf Uses of Etridiazole" (MRID No. 436660-01) was submitted in response to the Data Call-in (DCI) on July 2, 1991. Rather than providing chemical-specific exposure data, the submission provides only use information. Surrogate data, derived from the Pesticide Handlers Exposure Database (PHED) Version 1.1, and translated from another pesticide (daminozide), are then used to calculate exposure estimates.

2.0 DETAILED CONSIDERATIONS

Uniroyal determined the typical use patterns of etridiazole on ornamentals by surveying 15 commercial producers in 6 states. Applicator exposure estimates used PHED and the median values obtained for application rate and acreage. Chemigation was used in only one-third of the sites polled, the rest using hand wand or hand drench. The criterion used, 300 gallons per spray tank per day, is unrealistic given that half of the greenhouses/nurseries have more than 17 acres in production, and each acre would require, based on the survey responses, more than one tank full. The volume of spray suggested by the survey is actually greater than the "typical greenhouse" scenario of 1000 gal/day used by HED. Uniroyal also gathered information on the typical number of years worked in jobs using pesticides during this survey. A median number of years was chosen as representative of "typical" exposure. The median "work span" of 4 years applying pesticides to ornamentals cannot be used by HED for determination of handlers' lifetime average daily dose. It is HED policy to use 35 years as the average work span. Chemigation and hand-wand spray were described as the first and second-most common application methods for nurseries. Soil blending machines with a 0.5 yd³ or greater capacity are used for mixing in the granular formulation. This information is consistent with application methods used in HED scenarios for nurseries and greenhouses.

A golf course use "survey" was conducted by Uniroyal, consisting of telephone calls to six sales representatives with three different suppliers. Therefore the information is anecdotal, but may be useful for bounding estimates. Estimates of total used are based on very broad parameters provided by the sales personnel. One significant point is that up to half of the green treatments are performed at night, just after the last golfers leave. This could be used as a mitigation measure to limit post-application golfer exposure; application in early morning, which is typical, exposes more golfers to higher residues.

It is currently HED policy not to subset PHED data, but to use the PHED Version 1.1 Surrogate Data Tables, August 1998. The reason for using the Surrogate Tables is to increase the number of exposure data points ("replicates") available for each exposure scenario, thus increasing the statistical power of the analysis.

Because of the larger volumes potentially being applied, based on the author's survey, restricting the PHED to spray tanks of 300 gallons or less would not allow an upper-boundary estimate, but might supply a median estimate, which was the author's goal. Therefore HED would not use this restriction to determine short-term mixer/loader exposure. Mean values are appropriate for cancer risk estimates.

Most of the final PHED subsets contain less than the desired 15 replicants for each scenario. The author then used data from a Uniroyal daminozide Mixer/Loader Applicator greenhouse exposure study (MRID 418760-01) to bolster the number of dermal and inhalation replicants for etridiazole. In an HED review from 1991, this use of the daminozide data was considered acceptable for the greenhouse/nursery wettable powder use. However, certain provisions and precautions must be added. The mean exposure values used are appropriate for cancer risk estimates. However, rather than the mean, the maximum exposure would yield the most conservative short-term estimate, as stated by HED in the quoted study review. Also, due to the relatively high vapor pressure of etridiazole (1.07×10^{-2} mm Hg) compared to daminozide (1.7×10^{-4} mm Hg), the use of surrogate chemical studies is problematic. The EPA review of the daminozide study found that greenhouse mixer/loaders' and applicators' inhalation exposures ranged from 30-100% of dermal exposure, the highest inhalation exposure occurring when using a fine spray. Because etridiazole has an even higher vapor pressure, it is anticipated that comparable exposure scenarios would result in inhalation exposures equal or greater than dermal exposures (dermal exposure would be commensurately reduced). Therefore, while it is HED policy to use PHED surrogate data where no chemical-specific data exist, an exposure assessment for the greenhouse worker mixing and applying etridiazole should characterize the inhalation exposure as approaching dermal exposure levels. Chemical-specific properties, such as solubility, and characteristics of the formulation may affect the actual exposure by different routes.

3.0 CONCLUSIONS

When this study was submitted in 1995, EPA HED had not determined short or intermediate term toxicity endpoints for etridiazole. Therefore the submission deals only with risk assessments based upon the Q* carcinogenic potential determined by HED on August 31, 1993. Therefore, this paper presents usage information and exposure estimates without determining short or intermediate-term worker risk.

The current submission contains assessments conducted using PHED V1.1 and a Uniroyal-submitted study for daminozide. The dermal and inhalation exposure estimates in this study were all based upon median values and "typical worker practices," which are appropriate for cancer risk assessments. For non-cancer risk assessments, the HED evaluates worker risk based upon use of the chemical product at maximum label rate. Therefore the exposure estimates

presented in the submission cannot be used for short and intermediate term occupational risk assessments.

Product usage information provided in this report can be useful to HED in evaluating occupational and non-occupational exposures, as described previously.

References

Bacchus, S. Evaluation of Uniroyal Worker Exposure Study for Daminozide and Exposure Assessment for Labeled Uses, Assessment of Greenhouse Worker Exposure (HED Project #1-1374). EPA. August 1, 1991.

Non-Dietary Exposure Review

Subject: EPA Review of "Assessment of Worker Exposure and Potentia Risk for Ornamental and Turf Uses of Etridiazole"

Guidelines: 875.1200 Dermal exposure--Indoor
875.1400 Inhalation exposure--indoor

Other: PHED

DP Barcode: D266977

MRIDs: 43666001, 41876001

Chemical Codes: 084701 Etridiazole

Formulation Type: EC, WP

Exposed Individual: Applicator, Mixer/Loader

Application Method: High Pressure hand wand (greenhouse and ornamentals)

Outdoor Use Sites: Ornamental

Indoor Use Sites: Commercial/Non-Food

Greenhouse Use Sites: Ornamentals/Other Flowers

Other Use Sites:

Airborne Techniques:

Dermal Techniques:

Hand Techniques:

Foliar Techniques:

Indoor Surf. Techniques:

Reviewers: Gary Bangs

Review Approvers: Steve Knizner Approved on: July 20, 2000



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