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REVIEW NO.

EEB REVIEW

DATE IN: 10-10-91 OUT: AUG 19 1992
ASSIGNED: 10-17-91
CASE # :193924
SUB. # :S404462
ID # :59639-G

DATE OF SUBMISSION 10-1-91

DATE RECEIVED BY EFED 10-9-91

SRRD/RD REQUESTED COMPLETION DATE 2-1-92

EEB ESTIMATED COMPLETION DATE 2-1-92

SRRD/RD **ACTION** CODE/TYPE OF REVIEW 100 NC-FOOD FEED USE

MRID #(S) 42029701 123-2 PLANT TEST, LEMNA GIBBA TECH
42029702 123-2 PLANT TEST, LEMNA GIBBA 2 EC
42029703 123-2 FRESHWATER ALGAE, 2 EC
42029704 123-2 MARINE DIATOM PLANT TEST, 2 EC
42029705 123-2 FRESHWATER ALGAE, 2 EC
42029706 123-2 FRESHWATER DIATOM, 2 EC

DP TYPE 001 SUBMISSION RELATED DATA PACKAGE

PRODUCT MANAGER, NO. JOANNE MILLER 23, ERMUSELE-MATZER

PRODUCT NAME(S) CLETHODIM

TYPE PRODUCT HERBICIDE

COMPANY NAME VALENT USA CORP

SUBMISSION PURPOSE REVIEW PLANT TESTS TO SUPPORT ADDING AERIAL APPLICATION TO LABEL FOR SELECT 2 EC

COMMON CHEMICAL NAME CLETHODIM

REVIEWER: RICK PETRIE

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

MRID NOS. 420297-01, 2, 3, 4, 5, 6

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

AUG 19 1992 D169436

MEMORANDUM

SUBJECT: Review Of Aquatic Plant Growth Studies Submitted In Response To A Previous Review For Clethodim Herbicide

FROM: Douglas J. Urban, Acting Chief 8.19.92
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: Mary Ermusele-Matzer, PM-23 Team
Fungicide/Herbicide Branch
Registration Division (H7505C)

The Valent Chemial Company has submitted 6 non-target aquatic plant growth studies in response to a previous Ecological Effects Branch (EEB) review. In this previous review (dated 3/27/91), a Section 3 request for clethodim herbicide registration on cotton and soybeans was evaluated. The EEB concluded that the branch data base was complete for Section 3 registration with the exception of four outstanding 123-2 non-target aquatic plant growth studies. A non-target aquatic plant risk assessment could not be conducted until after receipt and review of the outstanding studies. The EEB concluded that we would agree to the Section 3 registration for cotton and soybeans on the condition that the outstanding aquatic plant studies be submitted and that aerial application be withdrawn from the cotton and soybean labels. Also, endangered/threatened grass species label statements were proposed. As a condition for registration, aerial application was withdrawn from the proposed cotton and soybean labels and clethodim was granted the Section 3 registration. The registrant has submitted the outstanding aquatic plant growth studies and is now requesting that the EEB complete our plant risk assessment for clethodim herbicide. The registrant has also requested that the Agency restore aerial application to the Section 3 label.

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The following 123-2 non-target aquatic plant growth studies were submitted:

1.) MRID 420297-01. Rhodes, J.E. and J.S. Hughes. 1991. The Phytotoxicity of RE-45601 Technical With Duckweed (Lemna gibba G3) in a Static System. Lab. I.D. B765-01-1. Conducted by Malcolm Pirnie, Inc., Tarrytown, N.Y. Submitted by Valent U.S.A. Corporation, Walnut Creek, CA. This study was determined to be CORE. Based on mean measured concentrations, the 14-day EC50 value is 1.34 mg ai/L; the NOEC value is 0.37 mg ai/L and the LOEC value is 0.79 mg ai/L.

2.) MRID 420297-02. Thompson, S.C., C.M. Holmes, and G.T. Peters. 1991. Select 2.0 EC: A 14-Day Toxicity Test With Duckweed (Lemna gibba G3). Laboratory Project ID 162A-117. Conducted by Wildlife International Ltd., Easton, MD. Submitted by Valent U.S.A. Corporation, Walnut Creek, CA. This study was determined to be SUPPLEMENTAL. This study is repairable pending submission of missing data as to how the fronds were counted. Based on mean measured concentrations, the 14-day EC50 value is 43.1 mg ai/L; the NOEC value is 22.3 mg ai/L and the LOEC level is 101.0 mg ai/L.

3.) MRID 420297-03. Crimstead, S.R., C.M. Holmes, and G.T. Peters. 1991. Select 2.0 EC: A 5-Day Toxicity Test With the Freshwater Alga (Selenastrum capricornutum). Lab. Project ID 162A-121. Conducted by Wildlife International Ltd., Easton, MD. Submitted by Valent U.S.A. Corp., Walnut Creek, CA.
This study was determined to by CORE. Based on mean measured concentrations, the 5-day EC50 value is 20.9 mg ai/L; the NOEC value is 3.65 mg ai/L and the LOEC level is 6.51 mg ai/L.

4.) MRID 420297-04. Grimes, J., S.G. Thompson, C.M. Holmes, and G.T. Peters. 1991. Select 2.0 EC: A 5-Day Toxicity Test With the Marine Diatom (Skeletonema costatum). Lab Project ID 162A-120. Conducted by Wildlife International Ltd., Easton, MD. Submitted by Valent U.S.A. Corp., Walnut Creek, CA. This study was determined to be CORE. Based on mean measured concentrations, the 5-day EC50 value is 8.6 mg ai/L; the NOEC value is 5.4 mg ai/L and the LOEC value is 9.72 mg ai/L.

5.) MRID 420297-05. Thompson, S.G., C.M. Holmes, and G.T. Peters. 1991. Select 2.0 EC: A 5-Day Toxicity Test With the Freshwater Alga (Anabaena flos-aquae). Lab. Project ID 162A-119A. Conducted by Wildlife International Ltd., Easton, MD. Submitted by Valent U.S.A. Corp., Walnut Creek, CA.
This study was determined to be CORE. Based on mean measured concentration, the 5-day EC50 value is 17.2 mg ai/L; the NOEC value is 11.2 mg ai/L and the LOEC value is 25.7 mg ai/L.

6.) MRID 420297-06. Thompson, S.G., C.M. Holmes, and G.T. Peters. 1991. Select 2.0 EC: A 5-Day Toxicity Test With the Freshwater Diatom (Navicula pelliculosa). Lab. Project ID 162A-118. Conducted by Wildlife International Ltd., Easton, MD. Submitted by Valent U.S.A. Corp., Walnut Creek, CA. This study was determined to be CORE. Based on the mean measured concentration, the 5-day EC50 value is 13.7 mg ai/L; the NOEC value is 8.0 mg ai/L and the LOEL value is 20.0 mg ai/L.

AQUATIC NON-TARGET PLANTS

The submitted studies listed above are acceptable for aquatic non-target risk assessment purposes. Based on the standard EEB scenarios used for calculating EEC's (estimated environmental concentrations), no adverse environmental effects to non-target or endangered/threatened aquatic plants are expected to occur from surface runoff or aerial drift following use of the maximum Select 2EC label rates for cotton and soybeans (refer to calculation sheet attached). The above listed studies (numbers 2-6) will only support the formulated product Select 2EC. Even though the laboratory studies submitted indicate that adverse non-target aquatic plant effects are not expected, it is impossible to predict expected effects to non-target aquatic grass species from these tests. There are currently no laboratory tests available for aquatic grass species, and none under development at this time (OECD, ASTM, EPA, CORVALLIS CONSULTED). Based on terrestrial plant EC50's, the aerial application of clethodim will adversely affect seed germination of ryegrass, oat, and corn, and the seedling emergence of ryegrass, oat, corn, and onion. Also, vegetative vigor EC50 values indicate that corn and onion will be adversely affected from aerial drift using a 5% value. Based on this information, adverse effects to aquatic grass species are also expected.

TERRESTRIAL NON-TARGET PLANTS

Non-target phytotoxicity data for terrestrial plants were previously reviewed (see 3/27/91 review). The EEB has concluded that non-target and endangered/threatened terrestrial grass species will be adversely affected from ground applications due to surface runoff calculations and from aerial application of clethodim based on 5% drift when compared to the EC25 values. The non-target plant phytotoxicity Tier III data requirement (124-1) for terrestrial plants was triggered. The EEB has deferred all Tier III 124-1 testing until after the agency has published a technical guidance document on Tier III testing.

CONCLUSIONS:

The aquatic non-target plant studies submitted are acceptable for risk assessment purposes. We defer to the EFGWB with regard to the status of 201-1 and 202-1 drift studies. After the drift studies have established the distance and concentration of clethodim off-target, the EEB will then be able to determine the distances that off-target concentrations are phytotoxic to non-target plants. Based on the data in EEB files and the proposed application rates for Select 2EC, adverse effects to non-target grass plants are expected to occur from normal applications. Therefore, the EEB must recommend against aerial application until after more definitive studies (drift and Tier III) are submitted.

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CLETHODIM (SELECT 2EC) WORKSHEET

The following clethodim aquatic non-target plant studies were statistically analyzed using TOXANAL:

1.) 420297-01, Lemna gibba using TGAI;

2.) 420297-02, Lemna gibba using TEP;

3.) 420297-03, Selenastrum capricornutum using TEP;

4.) 420297-04, Skeletonema costatum using TEP;

5.) 420297-05, Anabaena flos-aquae using TEP;

6.) 420297-06, Navicula pelliculosa using TEP.

Using mean measured concentrations, the following results were obtained: *

1.) EC50 = 1.43 mg ai/L, NOEC = 0.37 mg ai/L, LOEC = 0.79 mg ai/L, SLOPE = 1.69;

2.) EC50 = 43.07 mg ai/L, NOEC = 22.30 mg ai/L, LOEC = 101 mg ai/L, SLOPE = 3.81;

3.) EC50 = 20.90 mg ai/L, NOEC = 3.56 mg ai/L, LOEC = 6.51 mg ai/L, SLOPE = 5.38;

4.) EC50 = 8.65 mg ai/L, NOEC = 5.36 mg ai/L, LOEC = 9.72 mg ai/L, SLOPE = 5.34;

5.) EC50 = 17.19 mg ai/L, NOEC = 11.2 mg ai/L, LOEC = 25.7 mg ai/L, SLOPE = 6.90;

6.) EC50 = 13.65 mg ai/L, NOEC = 8.00 mg ai/L, LOEC = 20.00 mg ai/L, SLOPE = 7.09.

*These values are given because the printer was not working. Otherwise a printout would be provided.

NON-TARGET AQUATIC PLANT EEC'S

GROUND EQUIPMENT:

If 5% of the maximum label rate of 0.25# ai/acre were to runoff from a 10 acre field into an adjacent 1 acre 6 foot deep pond, the following average concentration would occur: 7.63 ppb.

If 5% of the maximum label rate of 0.25# ai/acre were to runoff from a 10 acre field into an adjacent 1 acre 6 inch deep water body, the following average concentration would occur: 91.75 ppb.

AERIAL EQUIPMENT:

If 5% of the maximum label rate of 0.25# ai/acre were to drift, the resulting concentration off-target would be: 0.0125# ai. Of the amount deposited on target, the concentration expected to move off-target via surface runoff would be: 0.075# ai (0.25# ai/acre X 0.6 aerial application efficiency value X 5% runoff value X 10 Acres).

Therefore, the total # ai off-target from use of aerial equipment = 0.0125# ai
+ 0.0750# ai

TOTAL = 0.0875# ai

Based on 0.0875# ai, the EEC values are:

6 feet of water = 5.34 ppb
6 inches of water = 64.23 ppb

When the EEC values are compared with the EC50 values, no adverse effects to the representative non-target aquatic plant species tested are expected to occur. Clethodim is highly selective for grass control ,however, no aquatic grass species was tested. Using terrestrial plant EC50 values, the aerial application of clethodim will adversely affect seed germination of ryegrass, oat, and corn, and seedling emergence of ryegrass, oat, corn, and onion. Also, vegetative vigor EC50 values indicate that corn and onion will be adversely affected from aerial drift. Based on the terrestrial EC50's, adverse effects to aquatic grasses are also expected.

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