UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
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RP
6-19-89

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: ID No. 464-511-1,3-Dichloropropene (Telone) - DEB's Response to Revised Labeling (7/27/88) Increasing Dosage via 1-Chisel Application Method (No Accession Number) (DEB No. 5312)

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and

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Herbicide, Fungicide and Antimicrobial Support
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THRU: Debra F. Edwards, Ph.D., Section Head
Tolerance Petition Section II
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Health Effects Division (H7509C)

Background

The registrant, Dow Chemical U.S.A., has requested a label change for Telone II (see July 27, 1988 letter from Robert W. Morgan, Monazer, Regulatory Planning Dow Chemical U.S.A. to Lois A. Rossi, PM 21). The change involves the use of one or more chisels per row when treating a crop with the fumigant. If only one chisel is used, a more concentrated application will be made at any given point of fumigant application. Registration Division/EPA had asked the EFGW Branch of EFFD and the NDE Branch of HED to examine the effects of the increased dosage associated with the 1 chisel application method.

Based on its 5/3/89 (Catherine Eiden) review of the proposed label change for Telone II, EFGW Branch concluded and recommended the following in part:

"Conclusions

1. If the chemical is taken up by plant roots, this may be of concern to DEB. Therefore, EFGWB concludes this review should also be routed to DEB for consideration of the possible effects of this one chisel application method and the associated increased dosage concentration on plant residues of Telone II.

2. EFGWB supports the proposed limitation which recommends using the 1 chisel method for row spacings > 24". Broadcast treatments are recommended for row spacings < 24". We believe the proposed limitation is adequate for purposes of preventing higher dosages from being applied per acre of cropland with the single chisel application technique than would be applied with the broadcast treatment rates. However, in Table 3 of the proposed label, the columns for 12, 18, and 20 inch row spacing application rates must be deleted from the label, as they may lead to applications with the one chisel method in row spacings less than 24 inches apart. This is a direct contradiction to Table 2., Footnote (1), which states, "For row spacings of less than 24 inches apply Telone II as a broadcast treatment".

Recommendations

1. Route this submission to DEB for consideration of the possible effects of the increased concentrations expected from a one chisel application method on plant residue.

2. Delete the columns for row treatments for 12, 18, and 20 inch row spacing application rates from the label as contained in Table 3. of the label. This is inconsistent with Table 2., Footnote (1) of the label, stating, "For row spacings less than 24" apply Telone II as a broadcast treatment." Application of Telone II with the one chisel method for row spacings less than 24" may result in increased total application rates of Telone II."

Additional comments on the proposed label change for Telone II were provided in the 9/14/88 efficacy review by Richard E. Michell RD/FHB as follows:

"For our records you should submit the rationale for increasing the delivery (flow) rate for single chisel row applications from 1-1/3 to 2 times the broadcast application flow rate.

Notes to PM:
...(2) For your information the proposed labeling differs from previously accepted labels in that the row application flow rates have changed. When two or more chisels per row are used the flow rates are less than the past, but when only one chisel per row is used the flow rates are higher than in the past."

DEB Conclusions

1. Based on results of radiolabeled studies significant levels of total ^{14}C residues of 1,3-dichloropropene (Telone) would result in vegetable crops treated with Telone II via the one chisel application method.

2. Until the nature of the total terminal residue in these crops has been adequately delineated in a new ^{14}C plant metabolism study submitted by the registrant, DEB cannot arrive at a conclusion regarding the magnitude of all residues of toxicological concern resulting in or on food/feed commodities from the proposed amended use of Telone II. Plant metabolism data for Telone has been called in via the registration standard.

DEB Recommendation

If residues of toxicological concern are found in food/feed commodities (see Conclusion 2 above) then crop residue trials must be submitted in conjunction with the Telone registration standard. Residue trials must reflect application of Telone at the maximum permissible flow/application rates for both broadcast and row treatments.

Detailed Considerations

The registrant, Dow Chemical U.S.A., has submitted revised labeling dated July 27, 1988 for Telone II Soil Fumigant in response to EPA's (Lois A. Rossi/PM 21) April 19, 1988 letter to Dow Chemical Co. (Robert W. Morgan) which cited deficiencies in Dow's original label dated December 22, 1987.

The revised Telone II label recommends the following application or flow rates for row treatments:

APPLICATION: TELONE II may be applied either as an overall (broadcast) or row treatment using suitable application equipment that will ensure placement of the fumigant at least 10 to 12 inches below the final soil surface. For row application, use chisel equipment with one chisel per row or two chisels spaced 12 inches apart to treat only the soil

where the crop is to be planted. When one chisel per row is used, adjust the fumigant flow rate to distribute about 1-1/3 times more fumigant per chisel than is recommended for overall application. When two chisels are used per row, apply at the same flow rate per chisel as for overall. In both cases, the amount of fumigant required per acre will decrease as the distance between rows is increased and vice versa. At time of planting, avoid placing the seed row directly over the furrow left by the applicator chisel. When a single chisel is used per row, place the seed 3 to 4 inches to one side of the chisel furrow; when two chisels are used, plant in the center of the area between the chisel furrows.

Row Application: Use chisel equipment to treat a band of soil where the crop is to be planted. For most crops, one or two chisels per row is recommended. When two chisels are used, a fumigant outlet spacing of 12 inches is recommended. Regardless of the number of chisels per row, the amount of fumigant per 1,000 feet of row should remain the same. The amount of fumigant actually used per acre will decrease proportionally as the distance between rows is increased.

To prevent seed germination problems caused by improper soil-to-seed contact or improper seeding depth, do not place the seed directly over the furrow left by the applicator chisel. When one chisel or more than 2 chisels per row is used, place the seed about 4 inches to one side of the chisel furrow. When two chisels per plant row are used, plant in the center of the area between the chisel furrows.

Refer to Tables 2 and 3 for application rates for various crops and soil textures.

Table 2. Row Treatment Rates for Nematode Control (1)

Crops	Soil Texture (2)	Recommended Rate Fl. oz./1000 ft. (3) of Row
Vegetable	Mineral	46 - 106
	Muck and Peat	93 - 212
Field (4)	Mineral	46 - 106
	Muck and Peat	93 - 212
Fruit, Nut and Nursery (5)	Mineral	46 - 106
	Muck and Peat	93 - 212

Table 2 - Footnotes

(1) For row spacing of less than 24 inches apply TELONE II as a broadcast treatment. (See Table I)

(2) For a description of soil textures see Table I.

(3) Fl. oz./1000 ft of row can be distributed in the row by 1 or 2 outlets (chisels). To determine actual gallons per acre needed for various row spacings see Table 3.

(4) Sugar Beets: To control sugar beet cyst nematode use 93 fl. oz./1000 ft. of row.

(5) Pineapples: Apply 24 to 36 gallons per acre in the row.

Table 3. Gallons of TELONE II per Acre Applied at Various Flow Rates per 1,000 ft. of Row and Row Spacings Selected from Table 2. (1)

Fl. oz./ 1000 ft. of Row(2)	Row Spacing (inches)								
	12(3)	18	20	24	30	36	40	42	50
46	15.7	10.4	9.4	7.8	6.3	5.2	4.7	4.5	3.8
53	18.0	12.0	10.8	9.0	7.2	6.0	5.4	5.2	4.3
62	21.1	14.1	12.7	10.6	8.4	7.0	6.3	6.0	5.1
71	24.2	16.1	14.5	12.1	9.7	8.1	7.2	6.9	5.8
93	31.6	21.1	19.0	15.8	12.7	10.5	9.5	9.0	7.6
106	36.1	24.0	21.7	18.0	14.4	12.0	10.8	10.3	8.7
123	41.9	27.9	25.1	21.0	16.7	14.0	12.6	12.0	10.1
142	48.3	32.2	29.0	24.2	19.3	16.1	14.5	13.8	11.6
212	72.1	48.1	43.3	36.1	28.9	24.0	21.6	20.6	17.3

(1) Refer to Table 2 for the rate needed for a specific crop and/or soil texture. To obtain the gallons per acre used for a row spacing not shown in this table, use the following equation:

$$\frac{\text{fl. oz./1000 ft. of row}}{\text{row spacing (inches)}} \times 4.08^{(a)} = \text{gallons per acre}$$

$$^{(a)}4.08 = \frac{12 \text{ inches} \times 43.56 \text{ (no. 1000 ft./acre)}}{128 \text{ (fl. oz. per gallon)}}$$

(2) Total amount, whether applied through one or two chisels per plant row.

(3) Equivalent to broadcast treatment.

DEB's Comments/Conclusions re: EFGWB's Conclusion/Recommendation No. 1

Based on DEB's previous review of the registrant's 1,3-Dichloropropene (Telone) lettuce/spinach and soybean metabolism study (see M. F. Kovacs, Jr., 7/7/88 review [RCB No. 3654]) DEB had concluded the following in part:

> "Significant ^{14}C residue levels (i.e., 1.32, 1.94, 2.84, 5.37, and 5.18 ppm) do occur in lettuce, spinach, soybean green forage, soybean pods and vines, and soybeans, respectively, following the proposed use of 1,3-D. Therefore, this use is definitely a food use requiring a full set of residue data requirements.
>
> The nature of the total terminal residue in lettuce, spinach, and soybeans has not been adequately characterized."

In the registrant's submitted ^{14}C plant metabolism studies, soil was treated by preplant injection at a rate equivalent to a field application rate of 36 gallons/acre or 331.2 lbs. ai./acre. The latter rate, which is equivalent to the highest recommended rate for vegetable crops with a 24 inch row spacing currently proposed in Tables 2 and 3 of the amended Telone II label, would also equate with the one chisel per row application method at a maximum flow rate of 212 fl. oz./1000 ft. of row also proposed in Tables 2 and 3.

Therefore, DEB can conclude at this time that significant levels of total ^{14}C residues of 1,3-dichloropropene (although currently uncharacterized and/or unidentified) would result in vegetable crops treated with Telone II via the one chisel application method. However, until the nature of the total terminal residue in these crops has been adequately delineated in a new ^{14}C plant metabolism study submitted by the registrant, DEB cannot arrive at a conclusion regarding the magnitude of all residues of toxicological concern resulting in or on food/feed commodities from the current or proposed amended use of Telone II.

If residues of toxicological concern are found in food/feed commodities, then future crop residue levels trials should reflect use of Telone II formulation applied at the maximum permissible flow/application rates for both broadcast and row treatments.

cc: Registration Standard File (Telone), RF, SF, E. Eldredge (PMSD/ISB), Kovacs, Circu (6).
RDI:D.Edwards:6/14/89:R.Loranger:6/14/89
H7509C:DEB:CM#2:Rm812A:557-7689:mb:6/19/89