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

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

Subject: Dimethoate on Citrus and Cherries. Section 24(C) Special Local Needs Registration for Several Formulations.
No Accession Number / No MRID Number
RCB Nos. 4496, -97, -98, -99, 4500, -01, -02.

From: Michael S. Metzger, Chemist
Dietary Exposure Branch
Health Effects Division (TS-769C)

Thru: Edward Zager, Section Head, SRS 2
Dietary Exposure Branch
Health Effects Division (TS-769C)

To: William H. Miller, PM 16 Team
Registration Division (TS-767C)

Several 24(C) Special Local Needs Registrations are submitted in which revised local registrations are requested for application of dimethoate to citrus (AZ) or to cherries (OR). Specific information regarding formulation, registration number and producers is on the next page.

Tolerances are established for the total residues of the insecticide dimethoate (O,O-dimethyl S-(N-methylcarbamoylmethyl) phosphorodithioate) including its oxygen analog (O,O-dimethyl S-(N-methylcarbamoylmethyl) phosphorothioate) in or on numerous raw agricultural commodities ranging from 0.002(N) ppm in milk to 5 ppm in dried citrus pulp, and include 2 ppm for cherries, grapefruit, lemons, oranges and tangerines, and 0.02(N) ppm for eggs and for the meat, fat and meat by-products of cattle, goats, hogs, horses, poultry and sheep (40 CFR 180.204 and 180.3(e)(5)). A Registration Standard (Residue Chemistry Chapter, 7/30/82) and a Final Registration Standard and Tolerance Reassessment (FRSTR, 10/1/87) have been completed for dimethoate.

Formulation	EPA Reg. No.	Producer
Setre Dimethoate 267EC (2.67 lbs.a.i./gal emulsifiable conc.)	2749-41-38167	Setre Chemical Company Memphis, TN
Clean-Crop Dimethoate 400 (4 lbs.a.i./gal, 43.5% a.i.)	34704-207	Platte Chemical Company, Inc. Fremont, NE
Helena Dimethoate 267EC (2.67 lbs.a.i./gal)	2749-41-5905	Helena Chemical Company Memphis, TN
Dimethoate 2.67EC (2.67 lbs.a.i./gal)	400-278-19713	Drexel Chemical Company Memphis, TN
Dimethoate 2.67EC (2.67 lbs.a.i./gal)	7001-187	J.R. Simplot Company Lathrop, CA
Setre Dimethoate 4EC (4 lbs.a.i./gal)	38167-7	Setre Chemical Company Memphis, TN
Clean-Crop Dimethoate 267EC (cherries) (2.67 lbs.a.i./gal)	2749-41-3470	Platte Chemical Company, Inc. Fremont, NE

Dimethoate is currently registered on the various labels for applications to citrus at different rates for air and ground applications. Ground applications can be made at 0.25-0.5 lbs.a.i./100 gallons/application with a 15-day PHI imposed, or up to 0.75 lbs.a.i./100 gallons spray with a 45-day PHI. Aerial applications can be made at rates up to 2.0 lbs.a.i./A with a 15-day PHI. A maximum of 2 applications may be made to mature fruit. Applications should not be made during bloom period. Livestock should not be grazed on cover crops in treated orchards.

The proposed labels are similar except that applications made using ground equipment are to be made at 2.0 lbs.a.i./A in not less than 20 gallons water per acre. Assuming application of 400 gallons spray/A by the current label, the proposed label does not increase the allowable maximum application rate, but does decrease the minimum application volume for ground applications making the volume comparable to that used for aerial applications. Additionally, applications may be made during bloom periods as follows:

Application during bloom, either by air or by ground, must

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be conducted only between the time of from one hour after sunset to 3 hours before sunrise.

The restriction prohibiting grazing or feeding of cover crops is not included on these 24(C) labels.

Dimethoate is currently registered for application to cherries (OR only) at 1 - 1 1/2 pints (0.33-0.5 lbs.a.i.)/100 gallons up to 400 gallons total spray volume per acre (1.3-2.0 lbs.a.i./A). A 21-day PHI is imposed.

The proposed use on cherries calls for a single application at 3 pints (1.0 lbs.a.i.)/A as a full coverage spray using ground equipment only. The PHI is reduced from 21 to 14 days. Feeding or grazing of livestock on cover crops is prohibited.

No new residue data were submitted for citrus. Residue data were previously submitted for oranges and lemons (PP#8F0661, Acc. No. 115340), and for grapefruits and tangerines (PP#1F1040, Acc. No. 116922). These data are summarized in Table 1.

Table 1: Combined Residues of Dimethoate and Its Oxygen Analog in Citrus

Application Rate (lbs.a.i./100 gal) (# Applications)	Total Vol, gal (Total lbs.a.i./ A/application)	PHI Range (Days)	Residue Range (ppm)
Oranges			
1.0 (1)	2000-2500 (20-25 lbs.a.i./A)	0 - 10	0.91 - 2.7
		15 - 24	0.83 - 2.7
		30 - 33	0.47 - 1.7
		45, 59	1.0, 0.64
		61, 89	0.11, 0.05
1.0 (2)		0 - 10	0.88 - 4.4
		13 - 27	1.8 - 2.1
		32, 41	1.4, 0.69
		62, 90	0.11, 0.10
1.0 (1)	350-400 (3.5-4.0 lbs.a.i./A)	0, 15, 30	1.6, 1.4, 1.1
1.0 (2)		0, 15, 32	2.6, 0.82, 0.74
1.0 (3)		0, 15, 30	0.7, 0.22, 0.09
0.5 (1)	2000-2500 (10-12.5 lbs.a.i./ A)	0 - 10	0.45 -2.0
		15 - 24	0.34 - 1.5
		30 - 35	0.16 - 0.72
		45	0.35
		59, 61	0.19, 0.11

Table 1: Combined Residues of Dimethoate and Its Oxygen Analog in Citrus (cont.)

Application Rate (lbs.a.i./100 gal) (# Applications)	Total Vol, gal (Total lbs.a.i./ A/application)	PHI Range (Days)	Residue Range (ppm)
0.5 (2)		0, 6	0.29, 1.4
		13, 27	1.2, 1.3
		34, 41	0.1, 0.56
		62, 90	0.03, 0.02
0.5 (1)	350-400 (1.75-2.0 lbs.a.i./A/app)	0 - 30	0.33 - 0.95
		34	0.05
0.5 (3)		0, 15	0.32, 0.12
		30	0.04
0.25 (1)	2000-2500 (5-6.25 lbs.a.i./A/app)	0	0.28, 0.45
		35	0.05, 0.02
0.25 (1)	350-400 (0.875-1.0 lbs.a.i./A)	0	0.41
		34	0.02
Lemons			
1.0 (2)	2000-2500 (20-25 lbs.a.i./A/app)	0 - 7	0.33 - 0.77
		14	0.10 - 0.28
		21 - 28	<0.02 - 0.10
		>60	<0.02
0.5 (2)		0 - 7	0.20 - 0.30
		≥14	<0.05 - 0.07
0.5 (2)	350-400 (1.75-2.0 lbs.a.i./A/app)	0	0.37 - 1.2
		15	0.35 - 0.69
		30	0.20 - 0.29
Grapefruit			
0.5 (1)	NP*	0	0.6 - 1.47
		15	0.59 - 0.63
		30, 35	0.17 - 0.24
0.5 (2)		0, 15, 30	1.3, 0.25, 0.18
0.25 (1)		0, 35	0.5, 0.09
Tangerines			
0.5 (1)	NP*	0	0.39 - 1.75
		15	0.31 - 0.32
		30, 34	0.11 - 0.30
0.5 (2)		0, 15, 30	1.52, 0.51, 0.29
0.25 (1)		0, 34	0.67, 0.13

*Application volumes and lbs.a.i./A not provided for grapefruit or tangerines.

Based on these data, we conclude that it is unlikely that combined residues of dimethoate and its oxygen analog will exceed the 2.0 ppm tolerance on grapefruit, lemons, oranges, or tangerines as a result of the proposed use assuming that the number of applications to citrus is restricted to 2 as on the current label. The proposed label should also include the restriction prohibiting grazing or feeding to livestock the cover crops from treated fields.

Residue data for cherries were submitted with this 24(C). The method used to generate these data is a modification of the method of W. A. Stellar and N. R. Paserela (J. Assoc. Anal. Chem., 55, 1280, 1972). Cherries are macerated and extracted X3 with acetone . The combined acetone fractions are concentrated, water is added, and the sample is washed with hexane. Following extraction into dichloromethane and clean-up with activated charcoal, the combined dichloromethane extracts are reduced in volume. Analysis is by GLC using a flame photometric detector. The reported limit of detection is 0.001 ppm for both dimethoate and the oxon in cherries. The chromatograms submitted are not adequate to confirm this limit of detection. Reported recoveries ranged from 83.5-97.2% (average = 91.3%) for dimethoate and 49.1-107.7% (average = 76.3%) for dimethoxon. Storage stability data were also submitted showing recoveries of 49.9-86.9% (average = 72.6%) for dimethoate and 36.3-76.2% (average = 59.5%) for dimethoxon for cherry samples stored frozen (-10°C) for 6 months. Treatment samples were all analyzed prior to analysis of storage stability samples (i.e. < 6 months storage for treated samples).

Residue data submitted with this 24(C) are summarized in Table 2. Cherry trees were treated once with dimethoate at 3 pints (1.043 lbs.a.i.)/A (=1X rate) using a ground sprayer.

Table 2: Residues of Dimethoate and Dimethoxon in Cherries

PHI (Days)	Residues (ppm) Dimethoate	Dimethoxon	Combined (Corrected)
0	1.515-9.841	0.029-0.360	1.87-10.32
7	0.209-3.60	0.087-0.489	0.44-4.36
14	0.126-1.731	0.115-0.588	0.31-2.77
21	0.062-1.178	0.128-0.656	0.28-2.17

Additional residue data for cherries are summarized below (taken from PP#7E1949). All applications were made in 250-500 total gallons spray per acre.

Table 3: Dimethoate Residues in Cherries (Old Data)

App Rate (Lbs.a.i./A)	PHI (Days)	Residues (ppm) Dimethoate	Dimethoxon	Combined*
1.23 - 1.33	0	0.41-4.48	<0.02-0.21	0.71-4.62
	3	1.84-2.41	0.08-0.12	2.01-2.59
	7, 8	0.39-2.92	0.07-0.24	0.51-3.31
	14, 15	0.10-0.41	0.07-0.24	0.19-0.61
	21	0.06-0.16	0.10-0.18	0.24-0.30
	28, 35	<0.02-0.12	0.03-0.24	0.04-0.42
1.67-1.85	0	1.41-8.03	<0.02-0.04	1.50-8.28
	3	0.37-4.79	0.04-0.15	0.47-5.26
	7	0.12-1.94	0.04-0.16	0.17-2.16
	14	0.04-0.79	0.04-0.25	0.10-0.99
	28, 35	<0.02-0.06	<0.02-0.12	<0.04-0.20
2.2-2.5	0	3.33, 3.33	0.04, 0.3	3.48, 3.81
	3	0.73, 1.43	0.10, 0.17	0.88, 1.71
	7	0.27, 0.36	0.11, 0.12	0.43, 0.51
	14	0.03, 0.08	0.03, 0.07	0.07, 0.17
	28, 35	<0.02-0.26	0.03-0.37	0.04-0.75

*Combined residues corrected for analytical method recovery.

These data indicate that the 2 ppm tolerance for dimethoate on cherries would be exceeded as a result of decreasing the PHI, even with the proposed decrease in application rate. Based on these data, DEB cannot recommend for any decrease in PHI from the current 21-day PHI.

Conclusions and Recommendations

DEB has no objections to the proposed modifications of the proposed 24(C) labels for citrus provided a grazing/feeding restriction for cover crops grown in treated fields is included on the label, and provided the label specifically limits the number of applications to two.

DEB recommends against the PHI modification and rate reduction for cherries since residue data indicate that the 2 ppm tolerance would be exceeded at a 14-day PHI even at the reduced application rate proposed.

cc:M. Metzger (DEB), Dimethoate S.F., E. Eldredge (ISB/PMSD), Circu (7), R.F.
RDI:E.Zager:EZ:11/18/88:RDS:11/18/88
TS-769C:DEB:M.Metzger:MM:Rm803a:CM#2:11/21/88

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