DIMETHOATE (027)

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EXPLANATION

Dimethoate was evaluated by the JMPR in several years from 1965 – 1994 and under the CCPR Periodic Review Programme in 1998. The compound was re-evaluated in 2003 for residues and toxicology. The 2003 Meeting recommended a number of MRLs and established an acute reference dose (ARfD) of 0.02 mg/kg bw. In 2006 the JMPR evaluated a pending request from CCPR about residues in barley and decided that the MRL for barley was acceptable. The 39th session of the CCPR in 2007 decided to retain draft MRLs for head lettuce and sweet peppers at Step 7 and requested JMPR to conduct the evaluation of alternative GAP for these commodities in 2008 (ALINORM 07/30/24).

New GAP data were submitted to re-evaluate dimethoate residues in lettuce in consideration of an alternative GAP (SCC, 2006 and 2008). On peppers, sweet new residue and GAP data of dimethoate after foliar application were submitted by Australia (Bodnaruk, 2008) and information on GAP by Japan (FAMIC, 2008).

For dimethoate, pesticide specifications were established for the technical material (TC), the technical concentrate (TK) and the EC formulation through the Joint FAO/WHO Meeting on Pesticide Specifications (JMPS), and published as Specifications and Evaluations for Agricultural Pesticides – Dimethoate (FAO, 2005).

USE PATTERN

Information on modified registered uses for lettuce and peppers was reported to the Meeting and is shown in Table 1.

Table 1 Registered uses for dimethoate.

Crop G/F	Country	Form. ai g/L	Application				PHI days
			Method	Rate kg ai/ha	Spray conc. kg ai/hL	No.	
Vegetables	Australia	EC, 400			0.03		7
Capsicum	Australia All States	EC, 400			0.03		7
Capsicum	Australia Qld, NSW, WA only	EC, 400			0.03		3
Peppers, Sweet	Japan	EC, 430	High volume spraying		0.022-0.043	1-2	7
Lettuce F	Italy	EC, 400	Spraying		0.028-0.04		14
Lettuce G	Ireland	EC, 400	Spraying, up to and including 9th leaf unfolded stage or before the head starts to form (up to and including BBCH 19)	0.34	0.15	1	Not specified
Lettuce G	UK	EC, 400	Spraying, up to and including 9th leaf unfolded stage or before the head starts to form (up to and including BBCH 19)	0.34	0.034-0.17	1	Not specified
Lettuce F	Ireland	EC, 400	Spraying, as necessary after planting out	0.34	0.15	6	14
Lettuce F	UK	EC, 400	Spraying, as necessary after planting out	0.34	0.034-0.17	6	14

F = outdoor G = indoor

RESIDUES RESULTING FROM SUPERVISED TRIALS

The Meeting received new information on two supervised field trials on capsicums (peppers, sweet) after pre-harvest foliar application. These new supervised trials data and foliar application data from three trials on peppers reported by the 2003 JMPR (FAO/WHO, 2004) are summarized in Table 2. The residue supervised trials on lettuce reported by the 2003 JMPR (FAO/WHO, 2004) are shown in Table 3. The data on peppers, sweet and lettuce, head were re-evaluated according an alternative GAP.

Where residues were not detected, data are recorded in the Tables as below the LOQ. Residue data, application rates and spray concentrations have generally been rounded to 2 significant figures or, for residues near the LOQ, to 1 significant figure. Although trials included control plots, no control data are recorded except where residues in control samples exceeded the LOQ. Residues are recorded unadjusted for procedural recoveries. Double-underlined residues are from treatments according to GAP and are valid for estimating maximum residue levels.

Table 2 Residues data from supervised trials of dimethoate on sweet peppers, VO 0445, after pre-harvest foliar spray

Location, year, variety, report No.	Application					Portion analysed	PHI, days	Residues, mg/kg		
	Method	kg ai/ha	kg ai/hL	Water L/ha	No.			Dimethoate (D)	Omethoate (O)	Ratio O:D
Australia, (Gilmore Rd.), 2001, Capsicum Merlin, Bodnaruk, 2002a , VG00097-1, Site1	Foliar	0.3	0.03	485-518	3	whole fruit	0 3 5	0.05 0.04 0.03	<0.02 0.02 0.02	 0.5 0.67
Australia, (Chili Lane), 2001, Capsicum Aries, Bodnaruk, 2002a, VG00097-1, Site 2	Foliar	0.3	0.03	496-509	3	whole fruit	0 3 5 7	0.15 0.08 0.04 0.03	0.02 <0.02 0.02 <0.02	
Australia, (Chili Lane), 2002, Capsicum Aries, Bodnaruk, 2002b, VG 00097-3, Site1	Foliar	0.3		250	3	whole fruit	0 1 3 7	0.16 0.10 0.12 0.14	<0.04 <0.04 <0.04 <0.04	
Australia, (Kindred, Tasmania), 2008, Capsicum annum var. inspiration, 07-HAL-005(a) site 65, Griffin, 2008	Foliar Protected cropping		0.03	505-570	3	whole fruit	3 7	0.42 0.26	0.15 0.10	0.36 0.38
Australia, (Gatton, Queensland), 2008, Capsicum annum var. Warlock, 07-HAL-005(a) site 66, Griffin, 2008	Foliar Field crop		0.03	966-1066	3	whole fruit	3 7	0.19 0.06	0.06 0.02	0.32 0.33

Table 3 Residue data from supervised trials of dimethoate on lettuce, VL 0482

Location, year, variety, report No.	Foliar application				BBCH [c] Portion analysed	PHI, days	Residues, mg/kg		
	kg ai/ha	kg ai/hL	Water L/ha	No.			Dimethoate (D)	Omethoate (O)	Ratio O:D
Outdoor application									
Italy (Caleppia di Settala), 2000, Lettuce Funly, Wilson (2001), DTF Doc. No.533-4228 [a], SCI 041/ 004399	0.42	0.04	1005	1	BBCH 14 Plant	0 7 14 21 28	29.97 0.18 ≤0.01 <0.01 <0.01	0.15 0.06 ≤0.01 <0.01 <0.01	
Italy (Mediglia), 2000 Lettuce Canasta, Wilson (2001), DTF Doc. No.533-4228 [a] SCI 041/ 004726	0.42	0.04	1010	1	BBCH 15/16 Plant	0 7 14 21 28	23.32 0.07 ≤0.01 <0.01 <0.01	0.10 0.02 ≤0.01 <0.01 <0.01	
Italy (Mediglia), 2001 Lettuce Canasta Wilson (2002a) DTF Doc. No.533-4229 [a] SCI 075/ 023703	0.42	0.04	1001	1	BBCH 13/14 Plant	0 14 21	64.22 ≤0.01 4.18 [d]	0.27 ≤0.01 0.12 [d]	
Italy (Caleppia di Settala), 2001, Lettuce Funly, Wilson (2002a) DTF Doc. No.533-4229 [a] SCI 075/ 023703	0.42	0.04	1001	1	BBCH 14 Plant	0 14 21	50.61 ≤0.01 <0.01	0.31 ≤0.01 <0.01	
Spain (Benimamet), 2000 Lettuce Tudela, Wilson (2001) DTF Doc. No.533-4228 [a] SCI 041/ 004399	0.41	0.04	981	1	BBCH 14 Plant	0 7 14 20 28	11.75 0.12 ≤0.01 <0.01 0.01	0.10 0.09 0.01 0.01 <0.01	
Spain (Burjassot), 2001 Lettuce Romance, Wilson (2002a) DTF Doc. No.533-4229 [a] SCI 075/ 023703	0.42	0.04	1008	1	Plant	0 14 21	18.03 0.11 0.08	0.07 0.06 0.03	0.545
Spain (Burjassot), 2001 Lettuce Romana, Wilson (2002a) DTF Doc. No.533-4229 [a] SCI 075/ 023703	0.42	0.04	1002	1	BBCH 47 Plant	0 14 21	6.73 0.07 0.04	0.12 ≤0.01 <0.01	
Spain (Burjassot), 2002 Lettuce /Rubia deVerano, Wilson (2002b) DTF Doc. No.533-4230 [a] SCI 092/ 024303	0.41	0.04	994	1	Plant	0 14 21	14.41 ≤0.01 <0.01	0.09 0.02 <0.01	
Greece (Menidi), 2000 Lettuce Paris Cos, Wilson (2001) DTF Doc. No.533-4228 [a] SCI 041/ 004399	0.41	0.04	990	1	BBCH 17 Plant	0 7 14 20 28	13.85 0.30 0.03 <0.01 <0.01	0.07 0.08 0.04 0.02 <0.01	1.33

Location, year, variety, report No.	Foliar application				BBCH [c] Portion analysed	PHI, days	Residues, mg/kg		
	kg ai/ha	kg ai/hL	Water L/ha	No.			Dimethoate (D)	Omethoate (O)	Ratio O:D
UK (Barway), 1996 Lettuce Saladin, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/1	0.34	0.17	200	6	BBCH 47/49 Whole plant Trimmed head	0 3 7 14	7.2 3.4 0.14 <u>0.07</u>	0.38 0.37 0.02 <u>0.02</u>	 0.286
UK (Melbourne), 1996 Lettuce Yates, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/2	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	7.2 1.7 0.65 <u>0.11</u> 0.03	0.34 0.20 0.21 <u>0.03</u> 0.01	 0.273
UK (Barrow-on-Trent), 1996, Lettuce Juden, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/ 3376/CN/3	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	8.3 1.1 0.42 <0.01 <u>0.01</u>	0.38 0.16 0.11 <0.01 <u>≤0.01</u>	
UK (Rosebank) 1996 Lettuce Roxette, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/4	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	6.6 2.0 0.09 0.06 <u>0.07</u>	0.28 0.30 <0.01 <0.01 <u>≤0.01</u>	
UK (Miford) 1997 Lettuce Target, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/5	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	4.6 0.38 0.06 <u>0.02</u> <0.01	0.15 0.08 0.01 <u>0.03</u> <0.01	 1.5
UK (Gedney Drove End), 1997, Lettuce Enza , Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/6	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	5.2 <0.01 <0.01 <u>0.04</u> 0.01	0.19 <0.01 <0.01 <u>≤0.01</u> <0.01	
UK (Swarkestone), 1997 Lettuce Saladin, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/7	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	4.5 1.5 0.08 <u>0.02</u> <0.01	0.28 0.38 0.02 <u>≤0.01</u> <0.01	
UK (Rosebank), 1997 Lettuce Roxette, Harrison (1998b) DTF Doc. No.533-4226 [b] AK/3376/CN/8	0.34	0.17	200	6	BBCH 49 Whole plant Trimmed head	0 3 7 14 21	4.0 1.3 0.06 <u>0.02</u> 0.01	0.07 0.16 <0.01 <u>≤0.01</u> <0.01	
Greenhouse application (indoor)									

Location, year, variety, report No.	Foliar application				BBCH [c] Portion analysed	PHI, days	Residues, mg/kg		
	kg ai/ha	kg ai/hL	Water L/ha	No.			Dimethoate (D)	Omethoate (O)	Ratio O:D
UK (Cranleigh), 1998 Lettuce Commander, Harrison (1999) DTF Doc. No.533-4227 [b] AK/4088/CN/1	0.34	0.17	200	1	BBCH 19 Trimmed head	28	0.17	0.03	0.176
UK (Great Abington), 1998 Lettuce Vagas, Harrison (1999) DTF Doc. No.533-4227 [b] AK/4088/CN/2	0.34	0.17	200	1	BBCH 19 Trimmed head	28	0.01	<0.01	
UK (Banks), 1998 Lettuce Wendal, Harrison (1999) DTF Doc. No.533-4227 [b] AK/4088/CN/3	0.34	0.17	200	1	BBCH 18 Whole plant Trimmed head	0 3 7 14 28	17.0 7.3 2.7 0.55 0.16	0.04 0.19 0.17 0.06 0.04	 0.25
UK (Carlton), 1996 Lettuce Vegas, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/1	0.34	0.17	198	1	BBCH 12-14 Whole plant Trimmed head	0 3 7 14 28	56.0 9.1 2.1 0.46 <0.01	0.26 0.26 0.18 0.09 <0.01	
UK (Carlton), 1996 Lettuce Flandra, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/2	0.34	0.17	202.7	1	BBCH 12 Whole plant Trimmed head	0 3 7 14 28	62.0 8.7 2.9 0.11 0.02	0.22 0.34 0.31 0.29 <0.01	
UK (Cranleigh), 1996 Lettuce Cortina, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/3	0.34	0.17	198	1	BBCH 13 Trimmed head	28	0.02	0.01	0.5
UK (Great Abington), 1996 Lettuce Vagas, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/4	0.34	0.17	204.7	1	BBCH 12 Trimmed head	28	0.01	<0.01	
UK (Great Abington), 1996 Lettuce Wendal, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/5	0.34	0.17	201.3	1	BBCH 41 Whole plant Trimmed head	0 3 7 14 28	18.0 14.0 9.7 4.3 1.1	0.04 0.17 0.45 0.49 0.29	
UK (Hesketh Bank), 1997 Lettuce Wendal, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/6	0.34	0.17	201.2	1	BBCH 18-19 Whole plant Trimmed head	0 3 7 14 28	42.0 9.0 3.4 0.71 0.06	0.22 0.40 0.30 0.13 0.03	 0.5

Location, year, variety, report No.	Foliar application				BBCH [c] Portion analysed	PHI, days	Residues, mg/kg		
	kg ai/ha	kg ai/hL	Water L/ha	No.			Dimethoate (D)	Omethoate (O)	Ratio O:D
UK (Cranleigh), 1996 Lettuce Luxor, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/7	0.34	0.17	201.7	1	BBCH 41 Trimmed head	28	1.1	0.17	
UK (Banks), 1996 Lettuce Rachel, Harrison (1998a) DTF Doc. No.533-4225 [b] AK/3375/CN/8	0.34	0.17	200	1	BBCH 41 Trimmed head	28	2.2	0.20	

[a] Dimethoate LOQ 0.01 mg/kg, LOD 0.002 mg/kg; omethoate LOQ 0.01 mg/kg, LOD 0.002 mg/kg.

[b] Dimethoate LOQ 0.01 mg/kg, omethoate LOQ 0.01 mg/kg.

[c] BBCH: Growth stage at last treatment.

[d] Remark in the report: "This residue is due to the farmer applying dimethoate which drifted onto the plot. A similar amount of omethoate was detected in the control plot (0.17 mg/kg)."

APPRAISAL

Dimethoate was evaluated by the JMPR in several years from 1965–1994 and under the CCPR periodic review programme in 1998. The compound was re-evaluated in 2003 for residues and toxicology. The 2003 Meeting recommended a number of MRLs and established an acute reference dose (ARfD) of 0.02 mg/kg bw. In 2006 the JMPR evaluated a pending request from CCPR about residues in barley and decided that the MRL for barley was acceptable. The 39th session of the CCPR in 2007 decided to retain draft MRLs for head lettuce (3 mg/kg) and sweet peppers (5 mg/kg) at Step 7 because of short-term dietary intake concerns and requested that an evaluation of alternative GAP for these commodities be undertaken by the JMPR at its 2008 Meeting (ALINORM 07/30/24). The draft MRL for cabbage, head (2 mg/kg) was deleted.

New GAP data were submitted by the manufacturer for the consideration of alternative GAP for lettuce, utilising supervised residue trial data, previously submitted to the 2003 JMPR. On sweet peppers, new residue and GAP data for dimethoate following foliar treatment were submitted by Australia and information on GAP by Japan.

Results of supervised residue trials on crops

The toxicological evaluation of omethoate, the major plant metabolite of dimethoate, indicated a greater level of toxicity than dimethoate, i.e., by a factor of 10. Since consumers are exposed to both dimethoate and omethoate residues at the time of consumption, the difference in toxicity was taken into account (1998 JMPR residue evaluations, p. 510) by multiplying the omethoate residues by a factor of 10 for calculation of the sum of the residues. The total toxicologically significant residues, calculated in this way, were used for the estimation of dietary exposure. The present Meeting followed the same practice. The sum (C_T) of dimethoate (C_D) and omethoate (C_O) residue concentrations reported for the specific commodities was calculated as $C_T = C_D + (10 \times C_O \times 1.075^5)$. The HRs and STMRs were estimated on the basis of the calculated C_T values.

In the case of undetectable residues, the concentration of omethoate residues was calculated by taking into account the average ratio of dimethoate to omethoate in the edible portions of the crop at the specified pre-harvest interval.

[5] The molecular mass of dimethoate is 229.28 and for omethoate 213.19, resulting in a factor of 1.075

Peppers, sweet

Dimethoate is approved in Australia for use in vegetables, and capsicums (Sweet peppers) for the control of aphids, thrips, leafhoppers, mites, bugs, wingless grasshoppers and fruit fly with a foliar spray concentration of 0.03 kg ai/hL. The pre-harvest interval is either 7 days (all States) or 3 days (against fruit fly in Queensland, Western Australia and New South Wales only). The labels were submitted for consideration as alternative GAPs.

Data from two new Australian supervised residue trials and the residue data reported by JMPR 2003 were evaluated according to Australian GAP for pre-harvest foliar spray applications at 0.03 kg ai/hL and a PHI of 3 days or of 7 days. The residues found 3 days after the last treatment of 3× 0.03 kg ai/hL were 0.04, 0.08, 0.14, 0.19 and 0.42 mg/kg for dimethoate and < 0.02, 0.02, < 0.04, 0.06 and 0.15 mg/kg for omethoate. After 7 days, the residues found were 0.03, 0.03, 0.06, 0.14 and 0.26 mg/kg for dimethoate and < 0.02, 0.02, 0.02, < 0.04 and 0.1 mg/kg for omethoate.

Based on the ratio of omethoate to dimethoate residues at 3 or 7 days after application, factors of 0.32, 0.33, 0.36, 0.38, 0.5, 0.67 were estimated. In the case of the two Australian trials with omethoate residues at LOQ (< 0.02, < 0.04 mg/kg) an average factor of 0.4 was included: $C_T = C_D + (LOQ \times 10 \times 1.075 \times 0.4)$.

The dimethoate equivalents of the sum of dimethoate and omethoate residues in sweet peppers 3 days after the final application were 0.17, 0.26, 0.31, 0.84 and 2.03 mg/kg. Using the value of 2.03 mg/kg as HR for the short-term dietary intake calculation, the ARfD was exceeded for children (130%). Therefore, the JMPR could not estimate a maximum residue level based on the GAP with a PHI of 3 days following a final foliar spray of 0.03 kg ai/hL.

The dimethoate equivalents of the sum of dimethoate and omethoate residues in sweet peppers 7 days after the final application were 0.03 kg ai/hl 0.12, 0.25, 0.28, 0.31 and 1.3 mg/kg. The trials match the second alternative GAP submitted by Australia. Based on the dimethoate residue data for a 7 day PHI, the Meeting estimated a maximum residue level of 0.5 mg/kg for sweet peppers and proposed to withdraw the previous recommendation of 5 mg/kg. According to the residue definition for risk assessment of dimethoate and 10 times omethoate, an STMR value of 0.28 mg/kg and HR value of 1.3 mg/kg were estimated.

Dried chilli peppers

Based on the residues in sweet peppers and a default concentration factor of 10, the Meeting estimated a maximum residue level of 3 mg/kg for dried chilli peppers and withdrew its previous recommendation of 50 mg/kg. According to the residue definition for risk assessment of dimethoate and 10 times omethoate, an STMR value of 2.8 mg/kg and HR value of 13 mg/kg were estimated.

Lettuce, Head

The residue data on lettuce reported by JMPR 2003 were evaluated according to new information on GAP.

As described above, the dimethoate equivalents of dimethoate and omethoate residues were calculated as follows: $C_T = C_D + (C_O \times 10 \times 1.075)$. Based on the ratio of omethoate to dimethoate residues 14 or 28 days after application, factors of 0.18, 0.27, 0.25, 0.29, 0.5, 0.5, 0.55, 1.3, 1.5 were estimated. Because of the wide range, the LOQ values for omethoate were not corrected by a factor.

The 2003 JMPR evaluated outdoor residue trials data on head lettuce from Greece (1), Spain (4) and Italy (4) with application of 0.04 kg ai/hL and 14 days PHI against Italian GAP. The residues at 14 days, in ranked order, were: < 0.01 (6), 0.03, 0.07 and 0.11 mg/kg for dimethoate, and < 0.01 (5), 0.01, 0.02, 0.04 and 0.06 for omethoate. For dietary risk assessment purposes, the dimethoate equivalents of the sum of dimethoate and omethoate residues were estimated as follows: < 0.12 (4), 0.12, 0.18, 0.23, 0.46 and 0.76 mg/kg.

Eight outdoor trials on head lettuce from the UK submitted to the 2003 JMPR were evaluated against Irish GAP (6 × 0.34 kg ai/ha, PHI 14 days). The residues at 14 days, in ranked order were: 0.01, 0.02, 0.02, 0.02, 0.04, 0.07, 0.07 and 0.11 mg/kg for dimethoate and < 0.01 (5), 0.02, 0.03 and 0.03 mg/kg for omethoate. For dietary risk assessment purposes, the dimethoate equivalents of the sum of dimethoate and omethoate residues were estimated as follows: 0.12, 0.13, 0.13, 0.15, 0.18, 0.29, 0.34 and 0.43 mg/kg.

The 2003 JMPR evaluated eleven residue trials conducted in glasshouses in the UK completed in 1996 and 1998. Dimethoate EC 400 g/L was applied once at 0.34 kg ai/ha (0.17 kg ai/hL) with a PHI of 28 days. GAP for glasshouse use was reported from Ireland (0.34 kg ai/ha, repeated as necessary with a 28-day PHI). The 2008 JMPR was informed that the Irish GAP had been modified as follows: spraying, up to and including 9th leaf unfolded stage or before the head starts to form (up to and including BBCH 19). Eight from eleven supervised trials complied with new Irish glasshouse GAP. The residues in ranked order were < 0.01, 0.01, 0.01, 0.02, 0.02, 0.06, 0.16 and 0.17 mg/kg for dimethoate and < 0.01 (4), 0.01, 0.03, 0.03 and 0.04 mg/kg for omethoate. For dietary risk assessment purposes, the dimethoate equivalents of the sum of dimethoate and omethoate residues were estimated as follows: 0.12 (3), 0.13, 0.13, 0.38, 0.49 and 0.59 mg/kg.

The Meeting was aware that the three data sets (outdoor Southern Europe, outdoor UK and indoor UK) are based on different GAPs but recognized no observable difference in the estimation of a maximum residue level between the data sets. The maximum dimethoate value of 0.17 mg/kg results from the UK indoor data set and the highest omethoate residue of 0.06 mg/kg (which leads to an HR of 0.76 mg/kg dimethoate equivalents) from the outdoor European data set. The Meeting concluded that the data can be combined. Residues in rank order (n = 25) were: < 0.01 (7), 0.01 (3), 0.02 (5), 0.03, 0.04, 0.06, 0.07 (3), 0.11 (2), 0.16 and 0.17 mg/kg for dimethoate and < 0.01 (14), 0.01, 0.01, 0.02, 0.02, 0.03 (4), 0.04, 0.04 and 0.06 mg/kg for omethoate.

The dimethoate equivalents, of the sum of dimethoate and omethoate residues, in head lettuce were: < 0.12 (4), 0.12 (5), 0.13 (4), 0.15, 0.18 (2), 0.23, 0.29, 0.34, 0.38, 0.43, 0.46, 0.49, 0.59 and 0.76 mg/kg. Based on the dimethoate residue data, the Meeting estimated a maximum residue level of 0.3 mg/kg for head lettuce and withdrew its previous recommendation of 3 mg/kg. According to the residue definition for risk assessment of dimethoate and 10 times omethoate, an STMR value of 0.13 mg/kg and an HR value of 0.76 mg/kg were estimated.

RECOMMENDATIONS

On the basis of data from supervised trials, the Meeting concluded that the residue levels listed in Table below are suitable for establishing MRLs and for dietary risk assessment.

Definition of the residue for compliance with MRLs: *dimethoate*

Definition of the residue for estimation of dietary intake: *dimethoate and omethoate*.

Commodity		MRL, mg/kg		STMR or STMR-P	HR or HR-P
CCN	Name	New	Previous	mg/kg	mg/kg
VL 0482	Lettuce, Head	0.3	3	0.13	0.76
VO 0445	Peppers, Sweet	0.5	5	0.28	1.3
HS 0444	Chilli peppers, (dry)	3	50	2.8	13

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDI) of dimethoate including its metabolite omethoate were estimated for the 13 GEMS/Food cluster diets based on 22 commodities. The results are shown in Annex 3 of the 2008 Report of the JMPR.

The IEDI of dimethoate including its metabolite omethoate was calculated on the basis of the STMRs and STMR-Ps estimated by the JMPR in 2003/2008 for globe artichoke, Brussels sprouts, cauliflower, celery, citrus fruits, head lettuce, mango, olives, olive oil, sweet peppers, wheat (except flour and wholemeal), wheat flour and wheat wholemeal as sum of dimethoate and omethoate residues, considering the ten times higher toxicity of omethoate. The 1998 JMPR estimated separate STMRs for dimethoate and omethoate, arising from the use of dimethoate, for asparagus, barley, Savoy cabbage, cherries, peas (pods and succulent, immature seeds), potato, sugar beet, and garden turnip. Because no sum STMR was calculated by the 1998 JMPR, the sum of the separate STMRs of omethoate (multiplied by 10) and dimethoate was used in the IEDI calculation by the current Meeting.

The IEDI for the 13 GEMS/Food cluster diets was 20–100% of the maximum ADI of 0.002 mg/kg bw. The Meeting concluded that the long-term intake of residues of dimethoate from uses that have been considered by the JMPR is unlikely to present a public health concern.

Short-term intake

The International Estimated Short-term Intake (IESTI) of dimethoate and its metabolite omethoate was calculated for the food commodities for which maximum residue levels, STMRs and HRs were estimated by the current Meeting and for which consumption data was available: i.e., sweet peppers and head lettuce. The results are shown in Annex 4 of the 2008 Report of the JMPR.

For head lettuce, an IESTI of 40% of the ARfD (0.02 mg/kg bw) was calculated for the general population and 80% for children 6 years and below. For sweet peppers, an IESTI of 30% of the ARfD was calculated for the general population and 80% for children 6 years and below.

The Meeting concluded that the short-term intake of residues of dimethoate (including its metabolite omethoate) from uses considered by the current Meeting is unlikely to present a public health concern.

REFERENCES

Author	Year	Title, Institution, Report reference
	2007	ALINORM 07/30/24. Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission, 30th Session, Roma, Italy, 2-7 July 2007. Report of the 39th Session of the Codex Committee on Pesticide Residues. Beijing, China, 7-12 May 2007.
Bodnaruk, K.	2002a.	Trials to determine the level of dimethoate in capsicums following foliar spraying and post-harvest flood spraying. VG00097-1. AKC Consulting, NSW, Australia. Unpublished.
Bodnaruk, K	2002b	Trials to determine the level of dimethoate in capsicums following foliar spraying and post-harvest flood spraying. VG 00097-3. AKC Consulting, NSW, Australia. Unpublished.
Bodnaruk, K	2008	Dimethoate – Horticulture Australia limited submission for JMPR 2008. Report No. AH04007-Dimethoate.08.01. 27 March 2008. Unpublished.
FAO/WHO	2004	Pesticide residues in food – 2003. Joint FAO/WHO Meeting on Pesticide Residues. Evaluations Part I – Residues. FAO Plant Production and Protection Paper 177, Rome, 2004, pages 364 – 367. Published.
FAO	2005	Specifications and Evaluations for Agricultural Pesticides – Dimethoate. http://www.fao.org/ag/agpp/Pesticid/Default.htm. Published.
FAMIC	2008	Summary of Good Agricultural Practices for Pesticide Uses. Food and Agricultural Materials Inspection Center (FAMIC), Agricultural Chemicals Inspection Station, 2-772, Suzuki-cho, Kodaira-shi Tokyo 187-001, Japan, March 1, 2008. Unpublished.
Griffin, D.	2008	Determination of residues of the active constituents: dimethoate and omethoate, or fenthion, in various fruit and vegetable crops following pre-harvest spray applications containing the formulated products, Danadim or Lebaycid, respectively. Horticulture Australia Ltd. Study No. 07-HAL-005(a)GLP. Study report release date: 9/4/2008. Unpublished.

Author	Year	Title, Institution, Report reference
Harrison, C.	1998a.	Study to determine the magnitude of residue of dimethoate and omethoate in protected lettuce following a single glasshouse application of Danadim Dimethoate 40 in the United Kingdom. Agrisearch UK. AK/3375/CN. DTF Doc. No. 533-4225. Unpublished.
Harrison, C.	1998b	Study to determine the magnitude of residue of dimethoate and omethoate in outdoor lettuce following 6 sequential field application of Danadim Dimethoate 40 in the United Kingdom. Agrisearch UK. AK/3376/CN. DTF Doc. No. 533-4226. Unpublished
Harrison, C	1999	Study to determine the magnitude of residue of dimethoate and omethoate in protected lettuce following a single glasshouse application of Danadim Dimethoate 40 in the United Kingdom. Agrisearch UK. AK/4088/CN. DTF Doc. No. 533-4227. Unpublished.
SCC	2006	Submission of Labels Dimethoate Finland and Ireland. SCC Project No.: 104 –003. Submission by Dr. Monika Hofer, SCC GmbH, Ring1, D-55234 Wendelsheim, Germany, 1 August 2006. Unpublished.
SCC	2008	Working document –dimethoate (27) – residue data for JMPR residue evaluation 2008. SCC project no. 104-014, 02/28/2008. Unpublished.
Wilson, A	2001	Dimethoate – residue decline curve study with an EC formulation containing 400 g/l dimethoate applied to lettuce in Italy, Spain and Greece in 2000. Huntingdon Life Sciences Ltd. Project SCI/041. DTF Doc. No. 533-4228. Unpublished.
Wilson, A	2002a	Dimethoate – residue study (at harvest) with an EC formulation containing 400 g/l dimethoate applied to lettuce in Italy and Spain in 2001. Huntingdon Life Sciences Ltd. Project SCI/075. DTF Doc. No. 533-4229. Unpublished.
Wilson, A.	2002b	Dimethoate - residue study (at harvest) with an EC formulation containing 400g/l dimethoate applied to lettuce in Spain in 2002. Huntingdon Life Sciences Ltd. Project SCI/092. DTF Doc. No. 533-4230. Unpublished.