MEVINPHOS (053)

EXPLANATION

Mevinphos was evaluated in the Periodic Review Programme of the CCPR by the 1997 JMPR, which concluded that the existing MRLs for some crops (broccoli, Brussels sprouts, cauliflower, citrus fruits, cucumber, grapes, melons, peas, spinach, strawberry and tomatoes) should be withdrawn, owing to inadequacies in the available information. The 31st CCPR decided to maintain the CXLs for those commodities for 4 years, as the manufacturer had indicated its intention to submit new residue data to the 2000 JMPR, except on Brussels sprouts and cauliflower. The compound was reviewed for toxicology at the 1996 JMPR, which allocated an ADI of 0 - 0.0008 mg/kg bw and an acute RfD of 0.003 mg/kg bw.

The Meeting received reports of studies on storage stability and processing, analytical methods, additional information on GAP, and updated supervised residue trials on vegetables and fruits.

Information on analytical methods, national MRLs, and residues in food in commerce were supplied by The Netherlands.

METHODS OF RESIDUE ANALYSIS

Analytical methods for crops

The sample is extracted with acetonitrile and the homogenate filtered into a separatory funnel. Solid sodium chloride is added and the acetonitrile layer drained through anhydrous sodium sulfate. The solvent is evaporated to near dryness and the residue dissolved in acetone. The final extract is analysed by GLC with an FPD in the phosphorus mode. The results of validation experiments are shown in Table 1.

Table 1. Recovery of mevinphos from fortified crops.

Crop	Fortification level of mevinphos (E + Z), mg/kg	Recovery, %[1]
Broccoli	0.05	84, 104
	0.5	103, 95
Cantaloupes	0.05	102
	1.0	101
Cucumbers	0.05	86
	0.1	99, 90, 102
	0.2	92
	1.0	91, 96
Grapes	0.05	92, 69, 69
	0.1	89, 90
	0.2	94
	1.0	72, 79, 81
Lemons	0.05	91, 104
	0.50	102, 76
Melons	0.1	95
	1.0	91
Peas	0.05	102, 106
	0.1	103, 85, 104
	1.0	95, 104

Crop	Fortification level of mevinphos (E + Z), mg/kg	Recovery, %[1]
Spinach	0.1	97, 108
	1.0	90
Strawberries	0.05	98, 69, 104
	0.1	93, 105
	0.2	97
	1.0	101
	1.5	91, 97
Tomatoes	0.05	78
	0.1	94, 92
	0.2	90
	1.0	95, 98

[1] Each value corresponds to one sample.

Stability of residues in stored analytical samples

Tomato, strawberry, broccoli, lettuce, and cucumber samples were fortified with mevinphos at 0.05 and 0.5 mg/kg and stored frozen at -20°C. Single samples taken after 0, 1, 3, and 6 months were analysed by GLC with an FPD. The percentages of residues remaining after storage are shown in Table 2. The complete study reports were not provided to the Meeting.

Table 2. Stability of mevinphos in fortified samples stored at -20°C.

Commodity	Storage period, months	Fortification, mg/kg	% remaining		
			E-isomer	*Z*-isomer	Total
Broccoli	0	0.05	96	98	97
	1	0.05	65	83	70
	3	0.05	55	89	65
	6	0.05	58	107	72
	0	0.5	98	98	98
	1	0.5	85	96	88
	3	0.5	74	86	78
	6	0.5	88	105	93
Cucumber	0	0.05	91	91	91
	1	0.05	72	94	78
	3	0.05	63	89	70
	6	0.05	64	100	74
	0	0.5	89	90	90
	1	0.5	88	93	89
	3	0.5	84	90	86
	6	0.5	88	95	90
Lettuce	0	0.05	88	89	88
	1	0.05	62	94	71
	3	0.05	49	86	59
	6	0.05	51	85	61
	0	0.5	91	91	91
	1	0.5	88	95	90
	3	0.5	78	87	80
	6	0.5	84	97	88
Strawberry	0	0.05	97	97	97
	1	0.05	94	93	94
	3	0.05	80	81	80
	6	0.05	89	91	90
	0	0.5	96	97	96
	1	0.5	86	87	86
	3	0.5	87	88	88
	6	0.5	93	99	95

Commodity	Storage period, months	Fortification, mg/kg	% remaining		
			E-isomer	*Z*-isomer	Total
Tomato	0	0.05	96	96	96
	1	0.05	94	99	95
	3	0.05	81	93	84
	6	0.05	80	97	85
	0	0.5	96	96	96
	1	0.5	98	101	99
	3	0.5	85	89	86
	6	0.5	89	102	93

USE PATTERN

The Meeting received additional information on the registered uses of mevinphos on selected crops in Mexico (Table 3).

Table 3. Registered uses of mevinphos in Mexico.

Crop	Application				PHI, days
	Method	kg ai/ha	kg ai/hl	No.	
Cucumber	Foliar	0.24-0.48	not specified	not specified	1
Egg plant	Foliar	0.24-0.48	not specified	not specified	2
Grape vine	Foliar	0.24-0.48	not specified	not specified	2
Lettuce	Foliar	0.24-0.48	not specified	not specified	2
Muskmelon	Foliar	0.24-0.48	not specified	not specified	1
Pepper	Foliar	0.24-0.48	not specified	not specified	2
Potato	Foliar	0.24-0.48	not specified	not specified	1
Tomato	Foliar	0.24-0.48	not specified	not specified	1
Watermelon	Foliar	0.24-0.48	not specified	not specified	1

RESIDUES RESULTING FROM SUPERVISED TRIALS

The Meeting received information on supervised residue field trials on broccoli, cantaloupes, cucumbers, grapes, lemons, melons, peas, spinach, strawberries and tomatoes.

Table 4	Lemons. USA
Table 5	Grapes. Mexico, USA
Table 6	Strawberries. Mexico, USA
Table 7	Broccoli. Mexico, USA
Table 8	Melons. Mexico, Cantaloupe. USA
Table 9	Cucumbers. Mexico
Table 10	Tomatoes. Mexico
Table 11	Spinach. Mexico, USA
Table 12	Peas. Mexico, USA

When residues were not detected, data in the Tables are shown as below the limit of quantification (LOQ) e.g. <0.01 mg/kg.

Lemons. Mevinphos was applied by tractor-mounted air blast sprayer or backpack single air blast sprayer in the USA. The trials were conducted with plot sizes of 140 to 220 m^2. Established populations were normal density (about 6.7 m tree space, 3.6 to 5.7 m tree spread). Field samples (>16 fruits from 3 individual trees) were stored in a freezer for 12 to 24 days before analysis.

Table 4. Mevinphos residues in lemons (whole fruit) resulting from supervised trial in the USA in 1993 (Obrist, 1997g).

Location	Form.	Application				Variety	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
CA. Tulare Co.	SL	1	0.98	1900	0.05	Pryor	0 1 2 4 7 10	0.14 0.14 0.05 0.04 <0.02 <0.02	0.07 0.08 0.05 0.05 0.03 0.03	0.21 0.22 0.10 0.09 0.03 0.03	SARS-93-14
CA. Tulare Co.	SL	1	0.98	1900	0.05	Lisbon	4	0.08	0.11	0.19	
AZ. Yuma Co.	SL	1	0.98	850	0.12	Lisbon Rough Lemon Stock	4	0.15	0.16	0.31	

Grapes. Mevinphos was applied by CO_2 backpack sprayer with U-shaped boom applicator in Mexico, and by air blast or inverted U boom in the USA. In Mexico 6 trials were conducted with plot sizes of 260 or 280 m^2. Established populations were 1300 to 2600 plants/ha. Field samples (6 samples, each containing 2.0 kg) were stored in a freezer for 1 to 2 months before analysis.

US trials were conducted with plot sizes of 90 to 180 m^2. Established populations were normal density (about 1 plant per 2.1 to 2.4 m, 3.4 to 3.7 m between rows). Field samples (12 bunches) were stored in a freezer for 1 month before analysis.

Table 5. Mevinphos residues in grapes resulting from supervised trials in Mexico (Obrist and Kent, 1998a) and the USA (Obrist, 1997e). All SL formulations.

Country, Year, Location	Application				Variety	PHI, days	Residues, mg/kg			Report no.
	No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
Mexico, 1997 Sonora St. Pesqueria Co.	1	0.44	1000	0.04	Flames	5	0.01	0.01	0.02	AMV96012
Mexico, 1997 Sonora St. Pesqueria Co.	1	0.44	1000	0.04	Flames	5	<0.01	<0.01	<0.02	
Mexico, 1997 Sonora St. Pesqueria Co.	1	0.44	1000	0.04	Flames	5	0.01	<0.01	0.01	
Mexico, 1997 Sonora St. Heroica Caborca Co.	1	0.44	1090	0.04	Superior	5	<0.01	<0.01	<0.02	
Mexico, 1997 Sonora St. Heroica Caborca Co.	1	0.44	810	0.05	Thompson Seedless	5	<0.01	<0.01	<0.02	
Mexico, 1997 Sonora St. Ejido Tlaxcala Co.	1	0.44	1090	0.04	Cardinal	5	<0.01	<0.01	<0.02	
USA 1993 CA. Riverside Co.	1	1.2	880	0.14	Thompson	5	<0.02	0.03	0.03	SARS-93-11
USA 1993 CA. Tulare Co.	1	0.98	1800	0.05	Emperor	5	0.06	0.04	0.10	
USA 1993 CA. Stanislaus Co.	1	0.98	780	0.13	Carrignan	5	0.035	0.048	0.083	

Country, Year, Location	Application				Variety	PHI, days	Residues, mg/kg			Report no.
	No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
USA 1993 WA. Cowlitz Co.	1	0.98	470	0.21	Riesling	0 1 3 5 7 10	0.63 0.43 0.25 0.10 0.09 0.06	0.30 0.24 0.16 0.10 0.09 0.07	0.93 0.67 0.41 0.20 0.18 0.13	

Strawberries. Mevinphos was applied by CO_2 backpack applicator in Mexico, and by CO_2 backpack sprayer or tractor-mounted sprayer in the USA. In Mexico, one trial was conducted on 3 plots of 60 m^2. Established populations were 80000 plants/ha. Field samples were stored in a freezer for 2.5 to 5 months before analysis.

US trials were conducted at 5 sites with 4 formulation types, and plot sizes of 46 to 140 m. Field samples from 12 areas of each plot were stored in a freezer for 11 days to 1 month before analysis.

Table 6. Mevinphos residues in strawberries resulting from supervised trials in Mexico (Obrist and Taylor, 1998e) and the USA (Obrist, 1997f). Analyses of replicate field samples from the treated plots in the Mexico trial are shown separately.

Country, Year, Location	Form.	Application				Variety	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
USA, 1997 CA. Tulare Co	SL	1	0.98	240	0.41	Seascape	3	0.21	0.15	0.36	SARS-93-12
	EC	1	1.00	240	0.42	Seascape	3	0.19	0.14	0.33	
	SL	1	0.84	240	0.36	Seascape	3	0.17	0.05	0.22	
	EC	1	0.84	240	0.36	Seascape	3	0.18	0.06	0.24	
USA 1997 CA. Monterrey Co.	SL	1	0.98	1400	0.07	Selva	3	0.51	0.35	0.86	
	EC	1	1.00	1400	0.07	Selva	3	0.68	0.41	1.09	
	SL	1	0.84	1400	0.06	Selva	3	0.61	0.15	0.76	
	EC	1	0.84	1400	0.06	Selva	3	0.77	0.18	0.95	
USA 1997 CA. Frenso Co.	SL	1	0.98	230	0.42	Chandler	3	0.48	0.28	0.76	
	EC	1	1.00	230	0.43	Chandler	3	0.48	0.27	0.75	
	SL	1	0.84	230	0.36	Chandler	3	0.30	0.07	0.37	
	EC	1	0.84	230	0.36	Chandler	3	0.39	0.09	0.48	
USA 1997 FL Alachura Co.	SL	1	0.98	490	0.20	Douglas	3	0.35	0.36	0.71	
	EC	1	1.00	490	0.20	Douglas	3	0.72	0.46	1.18	
	SL	1	0.84	490	0.17	Douglas	3	0.55	0.15	0.70	
	EC	1	0.84	490	0.17	Douglas	3	0.76	0.19	0.95	
USA 1997 OR Washing-ton Co.	SL	1	0.98	470	0.21	Red Gem	0 1 3 5 7 10	0.46 0.39 0.31 0.08 0.06 0.03	0.21 0.20 0.21 0.07 0.07 0.05	0.67 0.59 0.52 0.15 0.13 0.08	
	EC	1	1.00	470	0.21	Red Gem	0 1 3 5 7 10	0.83 0.49 0.36 0.23 0.15 0.07	0.29 0.21 0.21 0.17 0.14 0.11	1.12 0.70 0.57 0.40 0.29 0.18	
	SL	1	0.84	470	0.18	Red Gem	0 1 3 5	0.70 0.57 0.48 0.18	0.12 0.10 0.11 0.05	0.82 0.67 0.59 0.23	

Country, Year, Location	Form.	Application				Variety	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
							7 10	0.15 0.08	0.05 0.04	0.20 0.12	
	EC	1	0.84	470	0.18	Red Gem	0 1 3 5 7 10	0.71 0.52 0.37 0.15 0.14 0.07	0.15 0.09 0.08 0.05 0.05 0.03	0.86 0.61 0.45 0.20 0.19 0.10	
Mexico 1997 Guanajuato St.	SL	1	0.44	230	0.19	Solana	3	0.16, 0.15, 0.15	0.07, 0.06, 0.07	0.23, 0.21, 0.22	AMV96 008

Broccoli. Mevinphos was applied by CO_2 backpack applicator in Mexico and tractor-mounted boom in the USA. In Mexico, the trial was conducted on 3 plots of 6 m × 8 m each. Field samples (12 plants and >2 kg from each plot) were stored in a freezer for 3 to 5 months before analysis.

In the USA there were 5 trials with plots of 63 to 370 m^2. Field samples (12 heads from each plot) were stored in a freezer for 5 days to 2 months before analysis.

Table 7. Mevinphos residues in broccoli resulting from supervised trials in Mexico (Obrist and Taylor 1998a) and the USA (Obrist, 1997a). Analyses of replicate field samples from the treated plots in the Mexico trials are shown separately.

Country, Year, Location	Form.	Application				Variety	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
Mexico 1997 Guanajuato St. Villagran	SL	1	0.44	200	0.22	Pirata	3	0.05, 0.05, 0.04	0.16, 0.18, 0.16	0.21, 0.24, 0.20	AMV960 01 Control sample had 0.15 mg/kg as total mevinphos
USA 1994 CA Tulare Co.	SL	1	1.0	240	0.43	Early Green Sprouting	0 1 3 5 7 10	0.53 0.30 <0.015 <0.007 <0.015 <0.015	0.49 0.38 0.10 0.03 <0.006 <0.003	1.02 0.68 0.10 0.03 <0.02 <0.02	SARS-93-01
USA 1994 CA Santa Cruz Co.	SL	1	1.0	370	0.27	Arcadia	3	<0.015	0.07	0.07	
USA 1993 CA Fresno Co.	SL	1	1.0	240	0.43	EN C85-66 Early Sprouting	3	0.22	0.36	0.58	
USA 1994 CA Yolo Co.	SL	1	1.0	210	0.49	Pinnacle	3	0.39	0.55	0.94	
USA 1994 TX Uvalde Co.	SL	1	1.0	190	0.54	Southern Comet	3	<0.007	0.017	0.017	

Melons. Mevinphos was applied by CO_2 backpack applicator in Mexico. One trial was conducted on 3 plots of 6 m × 10 m each. Field samples (12 fruits, a quarter of each fruit was sent for analysis) from each plot were stored in a freezer for 3 months before analysis.

Cantaloupes. Mevinphos was applied by experimental backpack sprayer in the USA. Four trials were conducted with 4 different formulations, and a plot size of 62 m^2. Field samples (6 whole fruit from each plot) were stored in a freezer for 1 week before analysis.

Table 8. Mevinphos residues in melons and canteloupes resulting from supervised trials in Mexico (Obrist and Taylor, 1998b) and the USA (Obrist, 1997c).

Crop Country, Year, Location	Form.	Application				Sample (Variety)	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
Melon Mexico 1997 Guanajuato St.	SL	1	0.22	240	0.09	Pulp (Laguna)	3	0.02, 0.03, 0.03	0.02, 0.02, 0.02	0.04, 0.05, 0.05	AMV9 6005
Cantaloupe USA AZ Yuma Co.	SL	1	0.49	230	0.21	Whole fruit	3	<0.015	0.01	0.01	SARS-93-08
						Pulp (Top Score)		<0.007	<0.003	<0.01	
	EC	1	0.50	230	0.22	Whole fruit	3	<0.007	0.01	0.01	
						Pulp (Top Score)		<0.007	<0.003	<0.01	
	SL	1	0.41	230	0.18	Whole fruit	3	<0.007	0.006	0.01	
						Pulp (Top Score)		<0.007	<0.003	<0.01	
	EC	1	0.41	230	0.18	Whole fruit	3	0.02	0.01	0.03	
						Pulp (Top Score)		<0.007	<0.003	<0.01	

Cucumber. Mevinphos was applied by CO_2 backpack applicator in 7 trials in Mexico with plot sizes of 192 or 216 m^2. Field samples (6 samples, each of 12 fruits) from each trial site were stored in a freezer for 2 to 3 months before analysis.

Table 9. Mevinphos residues in cucumbers resulting from supervised trials in Mexico in 1997. All SL formulation. Report no. AMV9601 (Obrist and Kent, 1998b).

Location	Application				Variety	PHI, days	Residues mg/kg		
	No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total
Sinaloa St. Culiacan	1	0.22	330	0.07	Cortez	3	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	330	0.07	Conquistador	3	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	210	0.10	Cortez	3	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	250	0.09	Conquistador	3	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	340	0.06	Cortez	3	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	330	0.07	Conquistador	3	<0.01	<0.01	<0.02
Sinaloa St. Los Mochois	1	0.22	280	0.08	Napoleon	3	<0.01	<0.01	<0.02

Tomatoes. Mevinphos was applied by CO_2 backpack applicator in six trials in Mexico with plot sizes of 128 to 216 m^2. Established populations were 12500 to 20800 plants/ha. Field samples (12 fruits, >2 kg) were stored in a freezer for 1.5 to 2 months before analysis.

Table 10. Mevinphos residues in tomatoes resulting from supervised trials, all with 3-day PHIs and SL formulation, in Mexico in 1997. Report no. AMV96011 (Obrist and Taylor, 1998f).

Location	Application				Sample	Residues, mg/kg		
	No.	kg ai/ha	water l/ha	kg ai/hl	(Variety)	*E*-isomer	*Z*-isomer	Total

Location	Application				Sample	Residues, mg/kg		
	No.	kg ai/ha	water l/ha	kg ai/hl	(Variety)	*E*-isomer	*Z*-isomer	Total
Sinaloa St. Culiacan	1	0.22	240	0.09	Cherry Tomato (Large)	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	240	0.09	Cherry Tomato (PSO4420)	<0.01	<0.01	<0.02
Sinaloa St. San Luis de Ahome	1	0.22	200	0.11	Saladet Tomato (Alta Hybrid)	<0.01	<0.01	<0.02
Sinaloa St. Ejido La Louisiana	1	0.22	200	0.11	Fresh Saladet Tomato (Alta Hybrid)	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	240	0.09	Ground Tomato (Divine Hybrid)	<0.01	<0.01	<0.02
Sinaloa St. Culiacan	1	0.22	290	0.08	Ground Tomato (Homestead)	<0.01	<0.01	<0.02

Spinach. Mevinphos was applied by CO_2 backpack applicator in Mexico, and by CO_2 backpack sprayer or tractor-mounted boom in the USA. In Mexico, the trial was on 3 plots of 40 m^2. Established populations were 166600 plants/ha. Field samples (2 kg of leaves) were stored in a freezer for 3 to 5 months before analysis. In the USA, 4 trials were conducted with plots of 93 to 120 m^2. Field samples (minimum 1 kg from 12 areas within the plot) were stored in a freezer for 8 days to 3 months before analysis.

Table 11. Mevinphos residues in spinach resulting from supervised trials in Mexico (Obrist and Taylor, 1998d) and the USA (Obrist, 1997b). Analyses of replicate field samples from the treated plots in the Mexico trial are shown separately.

Country, Year, Location	Form.	Application				Variety	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
USA 1994 CA Santa Cruz Co.	SL	1	0.50	370	0.13	Gladiator	0 1 2 4 7	4.6 1.4 0.63 0.11 0.02	2.9 1.4 0.79 0.20 0.09	7.5 2.8 1.4 0.31 0.11	SARS-93-06
		1	1.0	370	0.27	Gladiator	0 1 3 5 7 10	10 4.0 0.51 0.16 0.05 <0.015	6.1 3.0 0.74 0.36 0.17 0.04	16 7.0 1.2 0.52 0.22 0.04	
USA 1993 CA San Diego Co.	SL	1	0.51	470	0.11	St. Helens	4	0.15	0.20	0.35	
USA 1994	SL	1 1	1.0 0.50	470 190	0.21 0.27	St. Helens Fall Green	7 4	0.04 <0.007	0.09 0.03	0.13 0.03	
TX Uvalde Co.		1	1.0	190	0.54	Fall Green	7	<0.007	0.01	0.01	
USA 1994 TX Willacy Co.	SL	1	0.50	190	0.26	No.612	4	0.06	0.10	0.16	
		1	1.0	190	0.53	No.612	7	0.03	0.06	0.09	
Mexico 1997 Guanajuato St. Cartazar	SL	1	0.44	220	0.20	Gladiator	7	<0.01, <0.01, <0.01	<0.01, <0.01, <0.01	<0.02, <0.02, <0.02	AMV96 007

Peas. Mevinphos was applied by CO_2 backpack applicator in Mexico, and by CO_2 self-propelled bicycle, CO_2 backpack, and tractor-mounted sprayer in the USA. In Mexico the trial was on 3 plots of 40 m^2. Established populations were 150 kg/ha. Field samples (2.0 kg whole peas) were stored in a freezer for 2 to 4 months before analysis.

In the USA five trials were with plot sizes of 93 to 280 m^2. Established populations were normal density (about 525000 seeds per 4000 m^2). Field samples (12 areas within the plot, > 1 kg) were stored in a freezer for 1 to 2 months before analysis.

Table 12. Mevinphos residues in succulent peas resulting from supervised trials in Mexico (Obrist and Taylor, 1998c) and the USA (Obrist, 1997d). Analyses of replicate field samples from the treated plots in the Mexico trial are shown separately.

Country, Year, Location	Form.	Application				Sample (Variety)	PHI, days	Residues mg/kg			Report no.
		No.	kg ai/ha	water l/ha	kg ai/hl			***E***-isomer	***Z***-isomer	Total	
USA 1994 WI Columbia Co.	SL	1	0.50	200	0.25	Peas with pods	3	<0.007	0.006	0.006	SARS-93-10
						vines		0.05	0.04	0.09	
						Hay (EGO)		<0.015	0.01	0.01	
USA 1994 WI Walworth Co.	SL	1	0.50	240	0.21	Peas with pods (Quad)	0	0.47	0.27	0.74	
							1	0.13	0.08	0.21	
							2	0.04	0.02	0.06	
							3	0.02	0.01	0.03	
							5	<0.007	<0.006	<0.021	
							7	<0.007	<0.003	<0.01	
						vines	0	4.2	2.4	6.6	
							1	0.80	0.81	1.6	
							2	0.16	0.26	0.42	
							3	0.03	0.07	0.10	
							5	<0.007	0.01	0.01	
							7	<0.007	<0.003	<0.01	
						hay	0	0.10	0.31	0.41	
							1	0.03	0.12	0.15	
							2	<0.015	0.03	0.03	
							3	<0.007	0.02	0.02	
							5	<0.007	<0.003	<0.01	
							7	<0.007	<0.003	<0.01	
USA 1994 MN Redwood Co.	SL	1	0.50	187	0.27	Peas with pods	3	<LOQ	0.007	0.007	
						vines		0.02	0.03	0.05	
						hay (Del Monte 7071)		<0.007	<0.006	<0.013	
USA 1994 MN Polk Co.	SL	1	0.50	190	0.27	Peas with pods	3	<0.015	0.01	0.01	
						vines		0.06	0.16	0.22	
						hay (Wando)		0.03	0.10	0.13	
USA 1994 WA Grant Co.	SL	1	0.50	220	0.23	Peas with pods	3	0.03	0.04	0.07	
						vines (Scout)		0.20	0.23	0.43	
Mexico 1997 Guana-juato St. Silao	SL	1	0.22	240	0.09	Peas with pods (Del Monte 5063)	3	<0.01, <0.01, <0.01	<0.01, <0.01, <0.01	<0.02, <0.02, <0.02	AMV96006

RESIDUES IN PROCESSING

The Meeting received a report of one commercial processing study on lemons (Obrist, 1997h). Lemons were treated with a single application at 5 times the maximum label rate of 5.0 kg ai/ha with

1900 l/ha SL formulation. Mature lemons were harvested 4 days after application. The samples were shipped to the processing facility and processed into fresh juice, wet pulp, dry pulp, oil, molasses, and pasteurized juice. The processing procedure is shown in Figure 1.

Figure 1. Processing of lemons.

Fresh sample
⇓
Washing in water
⇓
Grinding to remove rot bruise
⇓
Abrade or rasp off Flavedo ⇒ centrifuge ⇒ ***PEEL OIL***
⇓
Juice extraction ⇒ press peel ⇒ Liming w/CaO
⇓ ⇓
Pulper finisher ⇒ ***WET PULP*** (70-73% H_2O) Press shredded material
⇓ ⇓ ⇓
FRESH JUICE Dryer (79-93°C)
⇓ ⇓ Concentration
Pasteurize to 88 °C for 15-20 sec. ***DRIED PULP*** (<10% H_2O) ⇓
⇓ ***MOLASSES***
Pack in bottles
(PASTEURIZED JUICE)

The results are shown in Table 13.

Table 13**.** Residues of mevinphos in lemons and processed fractions in the USA in 1993.

Application, Ref.	Sample	Residues (mg/kg)			Processing Factor
		E-isomer	***Z***-isomer	Total	
5.0 kg ai/ha × 1	Lemons (RAC)	0.10	0.24	0.34	-
4 PHI days	Fresh Juice	<0.02	0.02	0.04	0.12
	Wet pulp	0.07	0.19	0.25	0.74
	Dry pulp	<0.02	0.07	0.09	0.26
SARS-93-17	Oil	<0.02	<0.01	<0.03	<0.09
	Molasses	<0.02	<0.01	<0.03	<0.09
	Pasteurized Juice	<0.02	<0.01	<0.03	<0.09

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

The government of The Netherlands reported monitoring data for mevinphos on several crops (Table 14).

Table 14. Monitoring data for mevinphos on crops in The Netherlands, 1994-1997.

Commodity	Samples analysed [1]	Samples with residues	Mean residues, mg/kg [2]
Blackberries	299	5	<0.05
Chinese cabbage	413	5	<0.05
Celery	412	5	<0.05
Currants	576	2	<0.05
Endive	1503	29	<0.05
Lettuce	4134	116	<0.05

Commodity	Samples analysed [1]	Samples with residues	Mean residues, mg/kg [2]
Peppers	607	1	<0.05
Spinach	610	6	<0.05
Strawberries	3157	35	<0.05

[1] LOQ 0.05 mg/kg
[2] For samples without residues, half the LOQ is taken for the calculation of the mean value.

NATIONAL MAXIMUM RESIDUE LIMITS

The following national MRLs were reported.

Country	MRL, mg/kg	Commodity
Australia	0.25	Cabbages, head, flowerhead brassicas
	0.05*	Edible offal (mammalian), meat (mammalian)
Austria	0.05	Sugar beets
	0.1	Cabbages, grapes
	0.2	Apples, apricots, pears
	0.5	Cherries, peaches, plums
Belgium	0.1	Cucumbers, peas, peppers, potato, tomato
	0.2	Apples, pears
France	0.1	Beans, courgettes, cucumbers, egg plants, gherkins, grapes, hazelnuts, melons, peas, peppers, strawberries, tomato
	0.2	Apples, apricots
	0.5	Almonds, beets, cabbages, corn salad, fodder beets, garden cress, lettuce, peaches, plums, spinach
Luxembourg	0.1	Peas, peppers, potato, tomato
	0.2	Apples, pears
Netherlands	0.05*	Other food commodities
	0.1	Other vegetables, potatoes, other fruit
	0.2	Citrus fruit, pome fruit, apricots
	0.5	Other stone fruit, leaf vegetables (except herbs)
Portugal	0.1	Cucumbers, garlic, melons, tomato
Switzerland	0.3	Apples, grapes, pears, peas

* Limit of quantification

APPRAISAL

Mevinphos was evaluated by the Meeting in 1997 within the Periodic Review Programme of the CCPR. The Meeting concluded that the existing MRLs for mevinphos in some crops (broccoli, Brussels sprouts, cauliflowers, citrus fruits, cucumbers, grapes, melons, peas, spinach, strawberries, and tomatoes) should be withdrawn, owing to inadequacies in the available information. At its thirty-first session, the CCPR decided to maintain the Codex MRLs for those commodities for 4 years, as the manufacturer had indicated its intention to submit new data on residues to the 2000 JMPR, except for Brussels sprouts and cauliflower. The compound was reviewed for toxicity by the Meeting in 1996, which allocated an ADI of 0-0.0008 mg/kg bw and an acute RfD of 0.003 mg/kg bw.

The present Meeting received information on analytical methods, stability under storage on tomatoes, strawberries, broccoli, lettuce, and cucumbers, the results of supervised trials on broccoli, cantaloupes, cucumbers, grapes, lemons, melons, peas, strawberries, spinach, and tomatoes, and one study of processing of lemons. Information on analytical methods, national MRLs, and residues in food in commerce were supplied by The Netherlands.

Methods of analysis

Mevinphos consists of two isomers, *E* and *Z*. In the analytical method, residues are extracted by maceration with acetonitrile, and solid sodium chloride is added for separation. The acetonitrile layer is dried with anhydrous sodium sulfate, the solvent is evaporated, and mevinphos is determined by gas-liquid chromatography with flame photometry. The LOQs are 0.01 mg/kg for *E* plus *Z*, 0.02 mg/kg for *E*, and 0.01 mg/kg for *Z*; the recovery ranges from 69 to 108%.

Stability of residues in stored analytical samples

Studies on the stability of residues in stored tomatoes, strawberries, broccoli, lettuce, and cucumbers were reported. Samples were fortified with mevinphos at 0.05 and 0.5 mg/kg and stored frozen (-20 °C) for 0, 1, 3, and 6 months. As complete descriptions of the studies were not provided, the data could not be evaluated.

Studies of the stability of residues in lettuce, strawberries, and turnip tops were evaluated by the Meeting in 1997. Residues were stable at about 0.68 mg/kg (*E* plus *Z*) on strawberry fruit for 4-10 months, at about 1.0 mg/kg (*E* plus *Z*) on lettuce stored frozen for 3-10 months, and at about 0.47 mg/kg on turnip tops stored for 3-10 months.

Results of supervised trials

Supervised trials on lemons, strawberries, broccoli, spinach, and peas were conducted in Mexico and in the USA, where there is no registered GAP. No relevant GAP was available to evaluate the data on these crops, and the Meeting confirmed its previous recommendation to withdraw the MRLs for citrus fruits, strawberry, broccoli, spinach, and peas.

Although supervised trials of the use of mevinphos on *grapes and melons* were reported from Mexico and the USA, no data were provided on trials conducted according to GAP. The Meeting confirmed its previous recommendations to withdraw the MRL for grapes and melons except watermelon.

Although supervised trials of use of mevinphos on *cucumbers and tomatoes* were reported from Mexico, no data were provided from trials conducted according to GAP, and the Meeting confirmed its previous recommendations to withdraw the MRLs for cucumber and tomato.

Fate of residues during processing

One study on processing lemons was reported. The samples were processed into fresh juice, wet pulp, dry pulp, oil, molasses, and pasteurized juice. The processing factors were 0.12 for fresh juice, 0.74 for wet pulp, 0.26 for dry pulp, and <0.09 for oil, molasses, and pasteurized juice.

RECOMMENDATIONS

New data from trials on a number of commodities were available, but none were according to relevant GAP. The Meeting therefore confirmed the recommendations of the 1997 JMPR to withdraw the MRLs concerned.

Definition of the residue for compliance with MRLs and for estimation of dietary intake: sum of (*E*)- and (*Z*)-mevinphos.

Commodity		MRL, mg/kg	
CCN	Name	New	Previous[1]
VB 0400	Broccoli	W	W

Commodity		MRL, mg/kg	
CCN	Name	New	Previous[1]
FC 0001	Citrus fruits	W	W
VC 0424	Cucumber	W	W
FB 0269	Grapes	W	W
VC 0046	Melons, except watermelon	W	W
VP 0063	Peas (pods and succulent = immature seeds)	W	W
VL 0502	Spinach	W	W
FB 0275	Strawberry	W	W
VO 0506	Tomato	W	W

[1] Recommendations of the 1997 JMPR

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