PHOSMET (103)

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EXPLANATION

Phosmet is a broad-spectrum organo-phosphorus insecticide used to control a variety of insect and mite pests which attack berries, pome, stone and citrus fruit. It is also used on field, pasture and forage crops. Phosmet is non-systemic and acts by contact and ingestion as a cholinesterase inhibitor. It is registered in a number of countries, mainly for protecting fruits and vegetables.

Phosmet was evaluated for residues several times by the JMPR from 1976 to 2007, and was evaluated under the periodic review in 1994 for toxicity and in 1997 for residue. The ADI of 0-0.01 mg/kg bw was established in 1994. The ARfD of 0.2 mg/kg bw was established in 2003. Codex MRLs for cotton seed, grapes, apricots/peaches/nectarines, potatoes, tree nuts were established in 2002, and Codex MRLs for apricot, blueberries, citrus fruits, nectarine and pome fruits were established in 2007.

GAP and supervised trials data were submitted to the 2014 JMPR for cranberry.

USE PATTERN

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

Table 1 Registered uses for phosmet on cranberries

Crop	Country	Form.	Application					PHI days
			Method	Rate kg ai/ha	Spray conc. kg ai/hL	Water L/ha	No.	
Cranberries	USA	70 WSB	Foliar spraying	1.1-3.1	1.68-16.8		4	14

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

The Meeting received new information on supervised field trials on cranberries. Residue data are reported in Tables 2. Five supervised trials were conducted on cranberries in the USA in 1996 (Ref: R04625, DOC. NO.: 632-4301). A wettable powder formulation containing phosmet at 70% w/w was applied to cranberries at a nominal rate of 3.36 kg ai/ha. Four applications were made at intervals of approximately 10 days beginning after bloom with the last to mature fruits, 14 days before harvest. Duplicate samples of berries were collected 14 days after the last application. Mean residues of the duplicate samples are calculated.

The study report also includes residues of phosmet-oxon in addition to residues of phosmet. The results for phosmet-oxon are presented (all are below the LOQ) but not used further.

Results have not been corrected for concurrent method recoveries. Residues and application rates have generally been rounded to two significant figures. Although trials included control plots, residues of all controls are below LOQ.

The samples were frozen immediately after collection and stored at approximately -20 °C until extraction and analysis. The maximum storage period was 88 days (3 months). Residues of phosmet and phosmet-oxon were determined by GC-FPD using Stauffer Chemical company method WRC 73-43 (modified as Morse Laboratories Method Meth-14, Revision 3,). The LOQ of the method was 0.05 mg/kg. Mean procedural recoveries for phosmet at fortification levels of 0.05–10 mg/kg were within the acceptable range of 70–120%, RSD < 20%. The stability of phosmet in cranberry was confirmed by laboratory fortified samples (3× 1.0 mg/kg) that were stored in parallel with field samples. The average stability of phosmet after this period of 88 days was found to be 93%.

Because of the low phosmet oxon residues detected (<10% of parent), the 1997 JMPR decided that the definition of the residue for compliance with the MRL and for the estimation of dietary intake is phosmet.

Table 2 Phosmet residues in cranberries from supervised trials in USA

Country, year, variety	Application					Commodity analysed	PHI (days)	Residues [a] (mg/kg)	
	Form	kg ai/ha	Water L/ha	kg ai/hL	No.				
USA Wisconsin Rapids 1996 Ben Lear	700 WP	3.36 3.36 3.36 3.36	213 215 215 217	1.58 1.56 1.56 1.55	4	berries	14	0.82 0.88 [0.85]	
USA Biron, Wisconsin 1996 Ben Lear,	700 WP	3.36 3.36 3.36 3.36	213 215 215 217	1.58 1.56 1.56 1.55	4	berries	14	0.77 0.90 [0.84]	
USA Chatsworth, New Jersey 1996 Early black	700 WP	3.25 3.25 3.25 3.25	347 357 352 354	0.94 0.91 0.92 0.92	4	berries	14	0.12 0.14 [0.13][b]	
USA Chatsworth, New Jersey 1996 Early black	700 WP	3.36 3.14 3.14 3.25	365 341 340 350	0.92 0.92 0.92 0.93	4	berries	14	0.085 0.083 [0.084]	
USA Long Beach, Washington 1996 McFarlin	700 WP	3.36 3.25 3.47 3.47	203 132 245 133	1.66 2.46 1.42 2.62	4	berries	14	0.91 0.84 [0.88]	

[a] Residues in [ ] were mean of results from two duplicate sample.
[b] Higher residue from two dependent trials was considered and used.

APPRAISAL

Phosmet is a broad-spectrum organo-phosphorus insecticide used to control a variety of insect and mite pests which attack berries, pome, stone and citrus fruit. It is also used on field, pasture and forage crops. Phosmet is non-systemic and acts by contact and ingestion as a cholinesterase inhibitor. It is registered in a number of countries, mainly for protecting fruits and vegetables.

Phosmet was evaluated for residues several times by the JMPR from 1976 to 2007, and was evaluated under the periodic review in 1994 for toxicity and in 1997 for residue. The ADI of 0–0.01 mg/kg bw was established in 1994. The ARfD of 0.2 mg/kg bw was established in 2003. Existing residue definitions for phosmet were set at the 1997 JMPR Meeting. For plant and animal commodities, the residue definition for enforcement and dietary risk assessment is phosmet.

Results of supervised residue trials on crops

Cranberry

GAP and supervised trials data on cranberry were received and evaluated by the current Meeting. Phosmet is registered in the USA for use on cranberry at 1.1–3.1 kg ai/ha with a PHI of 14 days. Five supervised trials were conducted on cranberries in the USA in 1996. The residues of phosmet from four independent trials were: 0.13, 0.84, 0.85, 0.88 mg/kg, with the highest residue of 0.91 mg/kg from a replicate sample in one trial.

The Meeting estimated a maximum residue level of 3 mg/kg, a HR of 0.91 mg/kg, and an STMR of 0.845 mg/kg for cranberries.

RECOMMENDATIONS

On the basis of the data from independent supervised trials, the Meeting concluded that the residue concentrations listed below are suitable for establishing MRLs and for assessing IEDIs and IESTIs.

Definition of the residue:

For compliance with MRLs and for estimation of dietary intake: Phosmet.

Commodity		MRL, mg/kg	STMR or STMR-P, mg/kg	HR or HR-P, mg/kg
CCN	Name			
FB 0265	Cranberry	3	0.845	0.91

DIETARY RISK ASSESSMENT

Long-term intake

The estimates of long-term dietary intake for phosmet (ADI 0–0.01 mg/kg bw) were calculated by the current meeting for the 17 regional diets on the basis of the STMRs estimated by the JMPR in 2002, in 2007 and in 2014. The results are shown in Annex 3 of the 2014 Report.

The International Estimated Daily Intakes (IEDI) of phosmet, based on estimated STMRs from the uses were 3–90% (rounded) of the maximum ADI (0.01 mg/kg bw). The Meeting concluded that the long-term intake of residues of phosmet 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 phosmet was calculated for cranberry. The results are shown in Annex 4 to the 2014 Report.

The IESTI of phosmet calculated on the basis of the recommendations made by current meeting represented 0-3% of the ARfD (0.2 mg/kg bw) for children, 0–2% for the general population. The Meeting concluded that the short-term intake of residues of phosmet resulting from uses in cranberry that have been considered by the JMPR is unlikely to present a public health concern.

REFERENCES

R04625, DOC. NO.: 632-4301. Ourisson, Philippe, 1996, Phosmet: Magnitude of the Residue on Cranberry.
US Pesticide Data Program, http://www.ams.usda.gov/science/pdp