DIMETHOMORPH (225)

First draft was prepared by Dr Anita Stromberg, National Food Agency, Uppsala, Sweden

EXPLANATION

Dimethomorph, a cinnamic acid derivative, is a member of the morpholine group of fungicides and consists of a mixture of the E and Z isomers in approximately equal proportions. Its mode of action is through the disruption of fungal cell wall formation. When applied as a foliar spray dimethomorph penetrates the leaf surface and is translocated within the leaf to provide protectant action against plant pathogens belonging to class Oomycetes order Peronosporales. The fungicide is selective for downy mildews and members of the genus Phytophthora. Dimethomorph was evaluated for the first time by the JMPR in 2007. The 2007 meeting established an acceptable daily intake (ADI) of 0–0.2 mg/kg bw and an acute reference dose (ARfD) of 0.6 mg/kg bw. The residue (for compliance with the MRL and for estimation of dietary intake) for plant and animal commodities was defined as dimethomorph (sum of isomers). Maximum residues levels for 20 commodities were proposed by JMPR 2007.

Dimethomorph was listed by the Forty-fifth Session of the CCPR (2013) for evaluation of additional MRLs. The 2014 Meeting received GAP information and residue trial data from uses as foliar spray, soil drench or drip irrigation in oranges, strawberries, grapes, papaya, bulb onions, leek, spring onions, head cabbage, broccoli, pepper, lettuce leaf, spinach, lettuce head, taro, green peas, vining peas, lima beans, artichoke, and celery. An analytical method for animal matrices was provided as well as validation data for an analytical method in oranges. Processing studies in oranges, strawberry, onion, lettuce head and peas were also provided.

ANALYTICAL METHODS

The Meeting received a summary of validation data for the method Agriquem PE-804 which was developed for determination of dimethomorph residues in citrus fruits (doc. code 2010/1089351). The method (extraction method and extraction efficiency) was already reviewed by the JMPR in 2007. The method validation data for citrus was carried out concurrently with the analysis of the residue trials and not carried out as a separate project. The recoveries obtained as part of method validation for the parent dimethomorph (sum of isomers) in citrus fruit are presented in Table 1.

Table 1 Recovery data for the method Agriquem PE-804 for dimethomorph in citrus

Matrix	reported LOQ mg/kg	spike level	n	% recovery		RSD	Trial references
				mean	range		
Orange pulp	0.01	0.025	8	101.0	96–108	5.9	2006/1015077
		0.05	8	110.8	92–110	6.5	2005/1034175 2006/1015076
		0.1	8	81.6	73–88	6.0	2006/1015076
		0.2	4	97.3	94–104	4.9	2005/1034175
Orange whole fruit	0.01	0.05	8	88.5	78–106	9.9	2006/1015076 2006/1015076
		0.075	4	91.0	84–106.67	15.8	2005/1034175
		0.1	4	95.5	88–106.0	9.4	2006/1015076
		0.15	8	88.4	81.33–109.33	10.9	2006/1015076
		0.3	4	81.3	81.0–81.67	0.4	2005/1034175
Orange peel	0.01	0.075	6	87.1	72–104	14.4	2006/1015076
		0.1	4	91.0	87.0–95.0	4.5	2005/1034175
		0.15	6	75.3	71.33–78.67	3.9	2006/1015076
		0.2	4	100.4	92.0–106.5	6.1	2006/1015076
		0.25	4	87.0	77.2–79.2	12.2	2006/1015077
		0.4	4	86.7	73.0–93.25	10.7	2005/1034175

The recovery in all the matrices and fortification levels was in the acceptable range 70–110%. The relative standard deviation for all matrices was within the adequate level below 20%.

A new analytical method for animal matrices was submitted to the 2014 Meeting. In this method dimethomorph is extracted with methanol/water/hydrochloric acid. The extract is partitioned against cyclohexane at alkaline conditions and then evaporated to dryness and dissolved in a methanol/water mixture. The final determination of dimethomorph is performed by HPLC-MS/MS at two transitions. Transition m/z 388 → 301 is proposed as target transition for quantification and transition m/z 388 →165 for confirmatory purposes. The limitof quantification is 0.01 mg/kg for dimethomorph in milk, egg, muscle and liver.

Table 2 Recovery result of dimethomorph residues using method LO138/01 in different animal tissues

Sample Matrix	Dimethomorph	Fortification level	Average recovery%	RSD%	No of analysis
Egg	Dimethomorph m/z 388-301	0.01 0.1	100.4 100.9	1.9 2.3	5 5
	Dimethomorph m/z 388-165	0.01 0.1	97.8 100.9	1.9 1.6	5 5
Fat	Dimethomorph m/z 388-301	0.01 0.1	95.1 105.2	0.9 2.5	5 5
	Dimethomorph m/z 388-165	0.01 0.1	96.7 104.8	2.6 1.8	5 5
Kidney	Dimethomorph m/z 388-301	0.01 0.1	99.5 98.1	3.9 2.6	5 5
	Dimethomorph m/z 388-165	0.01 0.1	97.6 99.1	4.0 3.8	5 5
Liver	Dimethomorph m/z 388-301	0.01 0.1	97.2 98.8	4.8 2.9	5 5
	Dimethomorph m/z 388-165	0.01 0.1	98.0 98.7	2.4 3.1	5 5
Milk	Dimethomorph m/z 388-301	0.01 0.1	103.8 101.4	2.9 4.9	5 5
	Dimethomorph m/z 388-165	0.01 0.1	105.4 103.4	3.3 4.5	5 5
Muscle	Dimethomorph m/z 388-301	0.01 0.1	101.6 96.8	3.4 5.2	5 5
	Dimethomorph m/z 388-165	0.01 0.1	103.4 98.5	3.0 5.4	5 5

The method was independently validated with recoveries in milk, egg, muscle and liver in the range of 70–110% and a RSD of $\leq$ 20%.

USE PATTERN

Dimethomorph is a morpohline fungicide with protective action against plant pathogenic Phytophthora species and a number of downy mildew diseases on fruit, vegetables and potato.

The fungicide is registered in around 100 countries worldwide. Information on registered uses together with labels for dimethomorph was provided to the Meeting by one manufacturer. The representative uses relating to the crops under consideration for additional MRLs and revising some of the existing CODEX MRLs are summarized in the following tables.

Table 3 Selected representative uses of dimethomorph on berries and other small fruit as well as fruit and assorted and sub-tropical fruits crops and bulb vegetables (from labels provided)

Crop	Country	Form*	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Grapes	US (not registered for use in California	SC 43.5%	4	0.03–0.05 (concentrated) 0.006–0.02 diluted 0.12 per ground application 0.47 per aerial application	0.219 [a]	7 [i]	14	Spray
Grapes	US	SC 20.2%	2	0.12 per ground application 0.48 per aerial application	0.16–0.206 [b]	7–10 [j]	14	Spray
Strawberries (outdoor and protected)	Belgium	WP 50%	3	0.02–0.05	0.05 g ai/plant	l		Root drench
Strawberries (outdoor and protected)	Belgium	WP 50%	1	0.025–0.05		[m]	35	Drip irrigation
Strawberries (protected)	Ireland	WP 50%	1	0.003–0.05	0.05 g ai/plant at least	[m]	35	Drip irrigation or root drench
Strawberries (outdoor)	Ireland	WP 50%	1	0.15–0.25	1.5	[m]	35	Spray
Strawberries (protected)	The Netherlands	WP 50%	1	0.05	0.05 g ai/plant	[m]	35	Drip irrigation
Strawberries (outdoor)	The Netherlands	WP 50%	1	0.375–0.75	1.5	[p]	35	Spray
Strawberries	Taiwan	WG 18.7%	2	0.006	0.072–0.096	7 [n]	5	Spray
Strawberries	Taiwan	WP 50%	2	0.004–0.01	0.15–0.2	7 [n]	6	Spray.
Strawberries (outdoor)	UK	WP 50%	1	0.15–0.25	1.5	[m]	35	Spray
Strawberries (protected)	UK	WP 50%	1	0.025–0.05	0.05 g ai/plant	[m]	35	Drip irrigation or root drench
Bulb vegetables Garlic, Garlic great headed, Leek, Onion dry bulb, Onion green, Onion Welsh Shallot	Canada	SC 22.5	3 [g]	0.12 per ground application 0.49 per aerial application	0.225 [c]	5–7 [k]	0	Spray
Bulb vegetables Garlic, Garlic great headed, Leek, Onion dry bulb,	USA	SC 43.5%	3	0.12 per ground application 0.47 per aerial application	0.19 [d]	5 [k]	0	Spray

Crop	Country	Form*	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Onion green, Onion Welsh Shallot								
Bulb vegetables Garlic, Garlic great headed, Leek, Onion dry bulb, Onion green, Onion Welsh Shallot	USA	SC 20.2%	3 [g]	0.12 per ground application 0.49 per aerial application	0.206 [e]	5–7 [k]	0	Spray
Leek	Austria	WG 90 g/kg	3	0.03–0.045	0.18	7–14	21	Spray
Leek	France	DG 9%	2	0.023–0.036	0.18	7–10 [q]	14	Spray
Leek	Germany	WG 90 g/kg	3	0.03–0.045	0.18	7–14	21	Spray
Leek	Mexico	SC 8%	3	0.029–0.83	0.20–0.25	7–14	7	Spray
Leek	Norway	WG 90 g/kg	4	0.045–0.06	0.18	7–14	14	Spray
Leek	UK	DG 7.5%	3	0.03–0.075	0.15	7–14 [k]	21	Spray
Spring onions (Green onions)	Belgium	WG 7.5%	4	0.038–0.09	0.188	7–10	14	Spray
Spring onions (Green onions)	Hungary	WG 9%	4	0.03–0.09	0.180	7 [o]	14	Spray
Spring onions	Luxemburg	WG 7.5%	4	0.038–0.09	0.188	7–10	14	Spray

[a] Maximum rate per season is 0.95 kg ai/ha
[b] Maximum rate per season is 0.826 kg ai/ha
[c] Maximum rate per season is 1.12 kg ai/ha
[d] Maximum rate per season is 0.953 kg ai/ha
[e] Maximum rate of 0.619 kg ai/ha
[f] Maximum rate of 0.44 kg ai/ha
[g] Do not make more than two sequential applications before alternating to a labelled fungicide with different mode of action fungicide
[h] Apply at transplanting
i Apply after transplanting
[j] From transplanting until growth resumption in spring
[k] Apply prior to disease development
[l] Apply at transplanting, one month later and at growth resumption in spring
[m] Apply direct after planting
[n] Apply at beginning of infection
[o] Last treatment at skin development
[p] Apply direct after planting in propagation fields, waiting beds and production fields
[q] Carry out two applications during the winter protection period at a rate of a minimum of 14 days, of a maximum of 21 days

Table 4 Representative uses of dimethomorph on brassica vegetables (from labels provided)

Crop	Country	Form*	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Head cabbage	Belgium	WP 50 g/L	1–2		1.5	7–10 [f]	na	Spray
Head cabbage	USA	SC 20.2%	3 [a]	0.12 per ground application 0.49 per aerial application	0.206 [b]	7 [g]	0	Spray
Head cabbage	USA	SC 43.5%	3	0.12 per ground application 0.47 per aerial application	0.19 [c]	7 [g]	0	Spray
Broccoli	Belgium	WP 50 g/L	2		1.5	7–10 [h]	na	Spray
Broccoli	USA	SC 20.2%	3 [a]	0.12 per ground application 0.49 per aerial application	0.206 [b]	7 [g]	0	Spray
Broccoli	USA	SC 43.5%	3	0.12 per ground application 0.47 per aerial application	0.19 [c]	7 [g]	0	Spray
Brassica leafy vegetables, (Broccoli and others).	Canada	SC 22.5%	3 [e]	0.12 per ground application 0.49 per aerial application	0.225	5–7 [g]	0	Spray

[a] Two is maximum number of sequential applications before altering to a labelled fungicide with different mode of action
[b] Maximum rate per season is 0.619 kg ai/ha
[c] Maximum rate per season is 0.953 kg ai/ha
[d] Maximum rate per season is 1.169 kg ai/ha
[e] Do not make more than 2 sequential applications before alternating to a labelled fungicide with different mode of action fungicide
na = Not applicable
[f] Treatment before planting
[g] Apply prior to disease development
[h] Treatment before planting

Table 5 Selected representative uses of dimethomorph on fruiting vegetables other than cucurbits

Crop	Country	Form*	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Pepper, all varieties	Canada	SC 225 g/L	3 [a]	use min. 200 L/ha per ground and 50 L/ha per aerial application	0.225	5–7	4	Spray
Fruiting vegetable group tomato, eggplant, ground cherry (Physalis spp.) Pepper (all varieties) Pepino	Canada	WP 50%	5	use min 200 L/ha per ground and 20 L/ha for aerial applications	0.225	5–10 [h]	0	Spray

Crop	Country	Form*	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Tomatillo								
Pepper	Chile	SC 500 g/L	3	0.036	0.18	10–14	7	Spray
Fruiting vegetables group Eggplant Ground cheery Pepino (all varieties) Tomatillo Tomato	USA	SC 20.2%	2 [g]	0.12 per ground application 0.49 per aerial application	0.206 [b]	5–7 [i]	4	Spray
Fruiting vegetables (except tomatoes) Eggplant Ground cherry Pepper (all varieties) Tomatillo	USA Not registered for use in California.	SC 43.5%	2 [a]–5	0.12 per ground application 0.47 per aerial application	0.19 [c]	5 [h]	0	Spray
Pepper	Vietnam	WP 90 g/kg		0.0036–0.0045/16 L water		7–14	7	Spray
Tomato Non-stalked	USA	SC 43.5%	5 [f]		0.19 [c]	5 [h]	4	Spray
Tomato stalked	USA	SC 43.5%	5 [f]		0.19 [c]	5 [h]	4	Spray

[a] Two is maximum number of sequential applications before altering to a labelled fungicide with different mode of action.
[b] Maximum rate per season is 0.619 kg ai/ha
[c] Maximum rate per season is 0.953 kg ai/ha
[d] Maximum rate per season is 1.169 kg ai/ha
[e] Maximum rate per season is 1.14 kg ai/ha
[f] One is maximum number of sequential applications before altering to a labelled fungicide with different mode of action
[g] Do not make more than two sequential applications before alternating to a labelled fungicide with different mode of action fungicide
[h] Begin applications when plants are 4–6 inches high and prior to onset of disease infection.
[i] Apply prior to disease development

Table 6 Selected representative uses of dimethomorph on Leafy vegetables, Legume vegetable, Root and tuber vegetable (from labels provided)

Crop	Country	Form	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Lettuce only head varieties	Austria	WP 500 g/kg	4		0.36	7–10	14	Spray.
Leafy vegetables	Belgium	WP 500 g/kg	3		0.36	7	14	Spray
Leafy vegetables	Canada	SC 225	3		0.225	5–7	0	Spray
Lettuce	Cyprus	EC 72 g/L	3		0.144–0.18	7–8	7	Spray
Lettuce, open field exclusively	France	90 g/kg WG	3		0.144		28	Spray
Lettuce	Czech Republic	90 g/kg WG	3		0.18	7–12	21	Spray

Crop	Country	Form	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Leafy vegetables	Germany	WG 90 g/kg	3		0.18	7–12	21	Spray
Leafy vegetables	Greece	SC 22.5%	2		0.18	7–10	7	Spray
Leafy vegetables	Italy	SC 22.5%	2	0.018	0.18	7–10	7	Spray
Lettuce	Italy	EC 72 g/L	3	0.014	0.144	7–10	3	Spray
Protected cultivation on lettuce and lambs lettuce	Netherlands	SC 300 g/L	3		0.24 (0.8 L/ha)	7–12	7	Spray
Protected lettuce	Netherlands	WG 50%			0.15	7–12	14	Spray
Lettuce	Spain	WG 7.5%		0.3–0.35	max 3 kg/ha		7	Spray
Lettuce	Taiwan	WG 50%	3		0.15–0.2	7	6	Spray
Leafy vegetable (except Brassica vegetables)	USA	SC 20.2%	3 [d]	0.12 per ground application 0.49 per aerial application	0.206 [b]	7	0	Spray
Leafy vegetable (except Brassica)	USA	SC 43.5%	3	0.12 per ground application 0.47 per aerial application	0.19 [c]	7	0	Spray
Taro	USA Not for use in California	SC 43.5%	5	0.12 per ground application 0.47 per aerial application	0.19 [c]	7	7 days (leaves) 30 days (corms)	Spray
Peas without pods	Belgium	WG 7.5%	2		0.15	BBCH 15–60	21	Spray
Canned Peas	France	DG 9%	2		0.18	7–10 [e]	21	
Green Peas	Germany	WG 90 g/kg	2		0.18	8–14	21	Spray
Peas	Hungary	WG 90 g/kg	1		0.18			Spray
Peas without pods	Luxemburg	WG 7.5%	2		0.15	BBCH 15–60	21	Spray
Peas	Portugal	DG 9%		0.2	0.18	7–10		Spray
Lima Bean, succulent seed.	USA In CO, MT, NM, WY and states eastward	SC 43.5% .	5		0.19 [c]	7 [f]	0	Spray Application to lima bean must be made to Lima beans intended to harvest as succulent seed only
Ginseng	USA Not registered for use in CA.	SC 43.5%	5		0.19[c]	7	14	Spray Aerial application is not permitted

Crop	Country	Form	Application per treatment			Interval (days)	PHI (days)	Notes
			Max no	Conc kg ai/hL	Rate kg ai/ha			
Artichoke	France	EC 72 g/L	3	0.018–0.09	0.18	14 [g]	3	Spray
Artichoke	Italy	EC 72g/l	3	0.14–0.09	0.14–0.18	7–10	3	Spray
Celery	Germany	90 g/kg WG	2	0.018	0.18	10–14		Spray
Celery	Trinidad and Tobago	WP 69	2–3	0.024–0.045	0.135–0.18	3–4 weeks	7	Spray
Leafy vegetable (except Brassica) includes celery	USA	SC 43.5%	3	0.12 per ground application 0.47 per aerial application	0.19 [c]	7 [f]	0	Spray
Leafy vegetable (except Brassica vegetables) includes celery	USA	SC 20.2%	3[d]	0.12 per ground application 0.49 per aerial application	0.206 [b]	7 [f]	0	Spray

[a] Maximum rate per season is 1.169 kg ai/ha
[b] Maximum rate per season is 0.9535 kg ai/ha
[c] Maximum rate per season is 1.14 kg ai/ha
[d] Do not make more than two sequential applications before alternating to a labelled fungicide with different mode of action fungicide
[e] Preventive, intervene at the beginning of risk period
[f] Preventive application before infection occurs
[g] Carry out two applications with COACH PLUS in the risk period which generally begins at the beginning of the strong leaf growth period

Residues resulting from supervised trials on crops

The Meeting received information on supervised field trials involving dimethomorph for the following crops and commodities:

Group	Crop commodity	Portion of commodity to which MRL apply	Countries	Table No
FC, Citrus fruits	Orange FC 0004, oranges sweet, sour	Whole fruit, peel and pulp	Spain	7
FB, Berries and other Small Fruits	Grapes FB 0269	Whole fruit	USA	8
FB, Berries and other Small Fruits	Strawberry, FB 0275	Whole fruit	Belgium, Denmark, south and north France, Germany, the Netherlands, Spain and United Kingdom	9–13
FI, Assorted Tropical and Subtropical Fruit-inedible peel	Papaya FI 0350	Whole fruit (peel and pulp)	Brazil	14

Group	Crop commodity	Portion of commodity to which MRL apply	Countries	Table No
VA, Bulb Vegetables	Onion, bulb VA 0385	Bulbs	USA	15
VA, Bulb Vegetables	Leek VA 0384	Leek stems	Belgium, Germany, Greece, France (north and south), Italy, the Netherlands, Spain and UK	16
VA, Bulb Vegetables	Spring onions VA 0389	Whole plants	USA	17–18
VB, Brassica Vegetables, Head Cabbage, Flowerhead Brassicas	Head cabbage VB 0041	Cabbage heads (including wrappers leaves)	USA, Canada	19
VB, Brassica Vegetables, Head Cabbage, Flowerhead Brassicas	Broccoli VB 0040	Flower heads and stem	USA, Canada	20
VO, Fruiting vegetables, other than Cucurbits	Pepper VO 0051 representing VO 0050 (fruiting vegetables other than cucurbits)	Fruits	USA	21
VO, Fruiting vegetables, other than Cucurbits	Tomato	Mature fruits	USA	22*
VL, Leafy vegetables including Brassica Leafy vegetables	Lettuce Head VL 0482	Fresh heads with wrappers leaves	USA	23–24
VL, Leafy vegetables including Brassica Leafy vegetables	Lettuce leaf VL 0483	Leaves	USA	25
VL, Leafy vegetables including Brassica Leafy vegetables	Spinach VL 0502	Leaves	USA	26
VL, Leafy vegetables including Brassica Leafy vegetables	Taro leaves VL 0505	Leaf	USA	27
VP, Legume Vegetables	Green Peas Peas shelled (succulent	Whole commodity	France (north and south), Germany, Spain and the Netherlands, Denmark,	28–29

Group	Crop commodity	Portion of commodity to which MRL apply	Countries	Table No
	seed) VP 0064			
VP, Legume Vegetables	Lima Beans (young pods and/or immature beans) VP 0534	Whole commodity	USA	30
VR, Root and tuber vegetable	Ginseng VR 0604	Whole commodity after removing tops	USA	31
VS, Stalk and stem vegetables	Globe artichoke VS0620	Whole commodity	Germany, Italy, France (north and south), the Netherlands and Spain	32
VS, Stalk and stem vegetables	Celery VS0624	Whole commodity	USA and Canada	33
VR, Root and tuber vegetable	Taro, corms VR 0505	Whole commodity after removing tops	USA	34

* Trials were evaluated by JMPR 2007. See Evaluation report for dimethomorph, Table 48

Conditions of the supervised residue trials were generally well reported in detailed field reports. In most trials treated plots were not replicated but where results were reported from replicate plots, these are presented as individual values. Field reports provided data on the sprayers used and their calibration, plot size, residue sample size and sampling date. Although trials included control plots, no control data are recorded in the tables except where residues in control samples exceeded the LOQ. Residue data are recorded unadjusted for % recovery. When residues were not detected they are shown as below the LOQ (e.g. < 0.01 mg/kg). Laboratory reports included methods validation with procedural recoveries from spiking at residue levels similar to those occurring in samples from the supervised trials. Data on duration of residue sample under storage were also provided. Residues and application rates have generally been rounded to two significant figures or, for residues near the LOQ, to one significant figure. Where trials have involved two or more applications, the mean target application rate has been recorded unless the individual rates differ by more than 10%

Residues values from trials conducted according to a maximum registered GAP with supporting trials have been used for the estimation of maximum residue levels. The results included in the evaluation of the MRL, STMR and HR is underlined.

Oranges

Eight outdoor trials performed during growing season 2004–2005 in Spain were presented to the 2007 and 2014 Meeting. Two broadcast spray applications of dimethomorph at 0.41 kg ai/ha were made at 15 day intervals 28 ± 1 and 14 ±1 days before harvest.

Mature fruit were sampled and both the whole fruit and the pulp were analysed separately by LC-MS/MS, using Method PE 804 approved at this Meeting (see chapter analytical method). The limit of quantification was 0.01 mg/kg for and the mean recovery was 73–104.5.2% at fortification levels of 0.05–0.3 mg/kg for pulp, whole fruit and peel. The results of the residues from dimethomorph are summarized in Table 7.

Table 7 Residues in oranges from foliar application of dimethomorph from field trials in Spain

ORANGE Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues mg/kg			Reference & Comments
		kg ai/ha[a]	kg ai/hL	no	Growth stage at last treatment BBCH		Pulp	Peel	Whole fruit	
Spain 2004 (Valencia Late)	DC 150 g/L	0.41	0.014	2	85–89	0 7 14 21 28	 < 0.01 < 0.01 < 0.01 –	 0.219 0.167 0.105 –	0.152 0.066 0.042 0.037 0.019	2005/1034175 04/S/05
Spain 2004 (Valencia Late)	DC 150 g/L	0.41	0.014	2	85–89	0 7 14 21 28	 < 0.01 < 0.01 – –	 0.130 0.075 0.027 –	0.060 0.059 0.035 0.016 < 0.01	2005/1034175 04/S/06
Spain 2005 (Clemenules)	DC 150 g/L	0.41	0.014	2	81	7 14	< 0.01 < 0.01	0.138 0.144	0.091 0.047	2006/1015076 05/S/41
Spain 2005 (Clemenules)	DC 150 g/L	0.41	0.014	2	81	7 14	< 0.01 < 0.01	0.265 0.199	0.237 0.144	2006/1015076 05/S/42
Spain 2005 (Salustiana)	DC 150 g/L	0.41	0.014	2	83	0 7 14 21 28	 < 0.01 < 0.01 < 0.01 –	– 0.868 0.548 0.520 –	0.368 0.170 0.227 0.111 0.084	2006/1015077 (05/S/01)
Spain 2005 (Salustiana)	DC 150 g/L	0.41	0.014	2	83	0 7 14 21 28	 < 0.01 < 0.01 < 0.01	 1.243 1.216 0.644	0.607 0.388 0.604 0.330 0.178	2006/1015077 (05/S/02)
Spain 2005 (Lane Late)	DC 150 g/L	0.41	0.014	2	83	0 7 14 21 28	 < 0.01 < 0.01 < 0.01	 1.349 0.931 0.959	0.310 0.187 0.173 0.204 0.082	2006/1015077 (05/S/03)
Spain 2004 (Valencia Late)	DC 150 g/L	0.41	0.014	2	83	0 7 14 21 28	 < 0.01 < 0.01 < 0.01	 0.617 0.440 0.451	0.147 0.175 0.069 0.075 0.040	2006/1015077 (05/S/04)

[a] Spray volumes of 3000 L/ha

Grapes

During growing season 2008 eight outdoor trials on grapes were conducted in the USA. Dimethomorph was applied four times as a foliar spray using a 6–8 days interval. The applications of the concentrate (0.04–0.06 kg ai/hL) and the dilute (0.009–0.02 kg ai/hL) were made to side by side plots. The timing of the applications was from BBCH 7 (developing of fruits) until BBCH 8 (ripening of fruits).

The samplings of fresh grape fruits were analysed using HPLC-MS/MS Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery was 71–115% at fortification levels of 0.01–5.0 mg/kg. The results are summarized in Table 8.

Table 8 Residues in grapes from foliar application of dimethomorph in field trials in the USA

GRAPES Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues mg/kg Fruits		Reference & Comments
		kg ai/ha	kg ai/hL	no	Growth stage at last treatment		Conc.	Dilute	
Critical GAP USA		0.219		4		14			
USA (NY) 2008 (Cayuga White)	SC 500 g	0.225	0.05 conc. [a] 0.03 dilute [b]	4	BBCH 81 –	14 28	0.3 0.23	0.41 0.19	2009/7002489 R080044
USA (PA) 2008 (Concord)	SC 500 g	0.225	0.05 conc. [a] 0.009 dilute [b]	4	BBCH 85 –	14 28	0.11 0.10	0.46 0.11	2009/7002489
USA (WI) 2008 (King of the North)	SC 500 g	0.225	0.06 conc. [a] 0.03 dilute [b]	4	BBCH 85 –	14 28	1.77 1.53	1.28 1.22	2009/7002489 R080046
USA (MI) 2008 (Concord)	SC 500 g	0.225	0.05 conc . [a] 0.02 dilute [b]	4	Berries touching –	14 28	0.39 0.48	0.49 0.34	2009/7002489 R080047
CA (ON) 2008 (Concord)	SC 500 g	0.225	0.05 conc. [a] 0.03 dilute [b]	4	BBCH 83 –	14 28	0.05 0.05	0.11 0.11	2009/7002489 R080048
USA (CA) 2008 (Ruby red)	SC 500 g	0.225	0.05 conc. [a] 0.03 dilute [b]	4	Berry colour adv.	14 28	0.26 0.16	0.15 0.08	2009/7002489 R080049
USA (CA) Fresno 2008 (Thompson Seedless)	SC 500 g	0.225	0.04 conc. [a] 0.01 dilute [b]	4	Fruits 1.3 cm –	14 28	0.76 0.53	1.86 0.90	2009/7002489 R080050
USA (CA) Fresno 2008 (Fiesta)	SC 500 g	0.225	0.04 conc. [a] 0.01 dilute [b]	4	Fruits 5 cm –	0 7 14 28 35	2.44 1.43 1.83 1.16 0.76	1.68 1.88 1.51 0.89 1.57	2009/7002489 R080051
USA (CA) Madera 2008 (Thompson Seedless)	SC 500 g	0.225	0.04 conc. [a] 0.02 dilute [b]	4	Near mature –	14 28	0.40 0.29	0.75 0.66	2009/7002489 R080052
USA (CA) Tulare 2008 (Red Globe)	SC 500 g	0.225	0.04 conc. [a] 0.02 dilute [b]	4	BBCH 88 –	14 28	0.51 0.33	0.71 0.55	2009/7002489 R080053
USA (WA) 2008 (White Riesling)	SC 500 g	0.225	0.05 conc. [a] 0.02 dilute [b]	4	BBCH 82 –	14 28	0.56 0.59	0.92 0.61	2009/7002489 R080054
USA (OR)	SC	0.225	0.06	4	BBCH 85	14	1.33	0.33	2009/7002489

GRAPES Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues mg/kg Fruits		Reference & Comments
		kg ai/ha	kg ai/hL	no	Growth stage at last treatment		Conc.	Dilute	
2008 (Pinot Noir)	500 g		conc. [a] 0.02 dilute [b]		–	28	0.55	0.46	R080055
USA (CA) Kern 2008 (Crimson)	SC 500 g	0.225	0.04 conc. [a] 0.02 dilute [b]	4	BBCH 88 –	14 28	0.14 0.18	0.65 0.56	2009/7002489 R080547

[a] Spray volumes of 458–713 L/ha
[b] Spray volumes of 936–3663 L/ha

Strawberries

Twenty one additional (protected and outdoor) trials where dimethomorph was applied as root drench or drip irrigation and four additional (outdoor) trials where dimethomorph was applied as a foliar spray, were presented.

Root drench /drip application

In eight protected trials performed 2004 and 2007 on strawberries in three cultivars in Europe (Belgium, the Netherlands, Germany, Denmark, and northern France) dimethomorph was applied once as a root drench (green house) or (plastic tunnel) at planting/transplanting. The trials from 2004 included in addition to the treatment 0.125 g ai/plant, the treatment 0.0625 g ai/plant. The PHI was 34–46 days. The results are summarized in Table 9.

In two greenhouse trials on strawberries in Spain and south of France during growing season 2007 dimethomorph was added twice with a 14 days interval to the drip irrigation system in an amount of 0.75 kg ai/ha The residue decline was measured 0, 1, 3 ± 1 and 7 ± 1 days after treatment. The results are summarized in Table 10.

In three outdoor trials on strawberries in Europe 2004 (Belgium, Germany and the Netherlands) dimethomorph was applied once as a root drench at planting/transplanting. The trials from 2004 included in addition to the treatment 0.125 g ai/plant, the treatment 0.0625 g ai/plant. The PHI was 43 ± day. The results are summarized in Table 11.

In eight outdoor strawberry trials in Spain dimethomorph) was added twice to the drip irrigation system in an amount of 0.75 kg ai/ha 15 ± 1 day before harvest. Duplicate samples of strawberry fruits were sampled 0, 3,7,21 and 28 days after last application. PHI was one day. The results are summarized in Table 12.

Foliar spray application

In four independent outdoor strawberry trials (four cultivars) from northern Europe (Belgium, Germany, the Netherlands and United Kingdom) dimethomorph was applied once as a foliar spray at 1.5 kg ai/ha, the PHI was 35 days. The results are summarized in Table 13.

Analytical methodology

Mature fruit were sampled. In the trials reported from 2004 the strawberry fruits were analysed using GC-NDP and an extended version of the DFG S19 method reviewed by JMPR 2007. The mean recovery rate for the revised method was 90.5–111.5% at fortification levels of 0.01–1 mg/kg. The limit of quantification was 0.01 mg/kg.

In outdoor drip irrigations trials from Spain the analytical was LC-MS method PE 804 with a limit of quantification of 0.01 mg/kg, and the mean recovery rates were 89–99.2% at fortification levels of 0.015–0.3 mg/kg. The analytical method 575/0 using HPLC-MS/MS were used in the trials reported from 2008 and onwards. The limit of quantification for this method was 0.01 mg/kg and the mean recovery rates were 92–106% at fortification levels of 0.01–1 mg/kg.

Table 9 Residues in strawberries from applications of dimethomorph as root drench in protected trials in northern Europe (Belgium, the Netherlands, Germany, Northern France and Denmark)

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits	
		g ai/plant [a]	no	Growth stage at treatment (BBCH)			Reference & Comments
Critical GAP Ireland		0.05	1		35		
Belgium 2004 (Elsanta)	WP 500 g	0.125	1	19	34	0.511	2005/1004964/ 2010/1051738
Belgium 2004 (Elsanta)	WP 500 g	0.0625	1	19	34	0.304	AGR/21/04
The Netherlands 2004 (Elsanta)	WP 500 g	0.125	1	19	34	0.289	2005/1004964/ 2010/1051738
The Netherlands 2004 (Elsanta)	WP 500 g	0.0625	1	19	34	0.257	AGR/22/04
Germany 2004 (Elsanta)	WP 500 g	0.125	1	10	43 50	0.047 0.032	2005/1004964/ 2010/1051738
Germany 2004 (Elsanta)	WP 500 g	0.0625	1	10	43 50	0.030 0.028	ACK/12/04
Denmark 2004 (Everst)	WP 500 g	0.125	1	12	42 80	0.228 0.055	2005/1004964/ 2010/1051738
Denmark 2004 (Everst)	WP 500 g	0.0625	1	12	42 80	0.181 0.030	ALB/14/04
Northern France 2007 (Matis)	WP 500 g	0.125	1	11	36 46	0.18 0.21	2008/1051524 A7047 OB1
Germany 2007 (Elsanta)	WP 500 g	0.125	1	at planting	35 44	0.05 0.03	2008/1051524 A7047 GE1
The Netherlands 2007 (Elsanta)	WP 500 g	0.125	1	at planting	34 43	0.04 0.03	2008/1051524 A7047 NL1
Belgium 2007 (Elsanta)	WP 500 g	0.125	1	at planting	34 45	0.04 0.02	2008/1051524 A7047 BE1

[a] 250 mL/plant

Table 10 Residues in strawberries from applications of dimethomorph as drip irrigation in protected in southern Europe, (Spain and southern France).

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment (BBCH)			
Spain 2007 (Camarosa)	DC 150 g	0.75	2	87–89	0 1 4 7	0.06 0.08 0.08 0.09	2008/1005528 L070724
South France	DC	0.75	2	85–89	0	0.08	2008/1005528

STRAWBERRY Country, year	Form	Application			PHI (day	Dimethomorph	Reference & Comments
2007 (Clery)	150 g				1 4 7	< 0.01 < 0.01 < 0.01	L070725

[a] With 2500 L water/ha

Table 11 Residues in strawberries from applications of dimethomorph as a root drench in outdoor trials in northern Europe (Belgium, the Netherlands and Germany).

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits	Reference & Comments
		g ai/plant [a]	no	Growth stage at treatment (BBCH)			
Critical GAP Ireland		0.05	1		35		
Belgium 2004 (Elsanta)	WP 500 g	0.125	1	15	43 57	0.04 0.03	2005/1004964 AGR/19/04
Belgium 2004 (Elsanta)	WP 500 g	0.0625	1	15	43 57	0.02 0.02	
The Netherlands 2004 (Elsanta)	WP 500 g	0.125	1	15	43 61	0.01 < 0.01	2005/1004964 AGR/20/04
The Netherlands 2004 (Elsanta)	WP 500 g	0.0625	1	15	43 61	< 0.01 < 0.01	
Germany 2004 (Elsanta)	WP 500 g	0.125	1	10	44 56	0.02 0.02	2005/1004964 ACK/11/04
Germany 2004 (Elsanta)	WP 500 g	0.0625	1	10	44 56	0.01 0.02	

[a] 250 mL/plant

Table 12 Residues in strawberries from applications of dimethomorph, as drip irrigation in outdoor trials in southern Europe (Spain)

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits		
		kg ai/ha [a]	no	Growth stage (BBCH)		ind, value	average	Reference & Comments
Spain 2004 (Camerosa)	DC 150	0.75	2	87–89	1 3 7 21 28	0.21 0.022 0.033 0.033 0.063 0.060 0.052 0.049 0.035 0.037	0.022 0.033 0.062 0.051 0.036	2006/1015075 04/S/01
Spain 2004 (Camerosa	DC 150	0.75	2	87–89	1 3 7 21 28	< 0.01 < 0.01 0.022 0.023 0.016 0.015 < 0.01	< 0.01 < 0.01 0.023 0.016 < 0.01	2006/1015075 04/S/02

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits		
		kg ai/ha [a]	no	Growth stage (BBCH)		ind, value	average	Reference & Comments
Spain 2004 (Camerosa	DC 150	0.75	2	87–89	1 3 7 21 28	< 0.01 0.01 < 0.01 0.019 0.019 0.063 0.063 0.034 0.034	< 0.01 0.01 0.019 0.063 0.034	2006/1015075 04/S/03
Spain 2004 (Camerosa)	DC 150	0.75	2	87–89	1 3 7 21 28	0.129 0.125 0.057 0.058 0.180 0.184 0.043 0.043 0.031 0.031	0.127 0.058 0.182 0.043 0.031	2006/1015075 04/S/04
Spain 2005 (Camerosa)	DC 150	0.75	2	89	1 3 7 22 28	0.032 0.033 0.124 0.122 0.099 0.096 0.028 0.028 0.052 0.052	0.033 0.123 0.098 0.028 0.052	2006/1015079 05/S/05
Spain 2005 (Camerosa)	DC 150	0.75	2	89	1 3 7 22 28	0.026 0.025 0.064 0.066 0.048 0.048 0.026 0.026 0.023 0.023	0.026 0.065 0.048 0.026 0.023	2006/1015079 05/S/06
Spain 2005 (Camerosa)	DC 150	0.75	2	89	1 2 6 21 28	0.014 0.015 0.030 0.030 0.025 0.025 0.029 0.028 0.023 0.023	0.015 0.030 0.025 0.029 0.023	2006/1015079 05/S/07
Spain 2005 (Camerosa)	DC 150	0.75	2	89	1 2 6 21	0.055 0.055 0.111 0.111 0.117 0.116 0.069 0.069	0.055 0.111 0.117 0.069	2006/1015079 05/S/08

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits		
		kg ai/ha [a]	no	Growth stage (BBCH)		ind, value	average	Reference & Comments
					28	0.042 0.042	0.042	

[a] With 4444 L water/ha

Table 13 Residues in strawberries from foliar applications of dimethomorph in outdoor trials in northern Europe (United Kingdom, the Netherlands, Germany and Belgium)

STRAWBERRY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues mg/kg Fruits	Reference & Comments
		kg ai/ha [a]	no	Growth stage at treatment (BBCH)			
United Kingdom 2009 (Elsanta)	WP 500 g	1.478	1	65–71	0 28 35 42	131 [b] < 0.01 0.018 0.013	2009/1112576 LO90258
The Netherlands 2009 (Mara des Bois)	WP 500 g	1.59	1	61	0 29 36 43	115 [b] < 0.01 < 0.01 < 0.01	2009/1112576 LO90259
Germany 2009 (Dorselect)	WP 500 g	1.65	1	61	0 28 35 42	103 [b] 0.014 0.028 0.013	2009/1112576 LO90260 [c]
Belgium 2009 (Chalotte)	WP 500 g	1.598	1	65–81	0 28 35 42	105 [b] 0.061 0.012 0.012	2009/1112576 LO90261

[a] With 197–220 L water/ha
[b] Leaves
[c] Residues taken from specimen labelled as untreated. The corresponding treated specimen had residue levels < 0.01 mg/kg. It is assumed that there has been a mistake at the labelling either in the field or in the analytical phase.

Papaya

Four field trials were conducted 2011 in Brazil. Dimethomorph was applied four times as a foliar spray from the beginning of ripening until full maturity of the fruits with a 6–8 days interval.

Samples of mature whole fruit (peel and pulp) was analysed with LC/MS/MS/ using Method 535/1, The limit of quantification was 0.01 mg/kg and the mean recovery was 95–92% at fortification levels of 0.01–1.0 mg/kg. The results are summarized in Table 14 below.

Table 14 Residues in papaya from foliar application of dimethomorph in field trials in Brazil

PAPAYA Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment			
Brazil/SP 2011 (Formosa)	WP 500 g	0.5 0.5 0.5 0.5	4	BBCH 81–83	0 3 7 14	0.39 0.38 0.19 0.07	2012/3001445 G100547
Brazil/SP 2011	WP	0.5	4	BBCH	0	0.40	2012/3001445

PAPAYA Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment			
(Formosa)	500 g	0.5 0.5 0.5		81–78 [b]	3 7 14	0.18 0.26 0.03	G100548
Brazil/ES 2011 (Goldhem)	WP 500 g	0.5	4	BBCH 81–78 [b]	7	0.44	2012/3001445 G100549
Brazil/ES 2011 (THB)	WP 500 g	0.5	4	BBCH 83–78 [b]	7	0.67	2012/3001445 G100550

[a] with 1000 L water/ha
[b] During conduction of this trial ripe fruit were discarded, therefore a decrease in BBCH is observed.

Bulb onions

Ten residue decline trials were conducted in the USA and Canada during growing season 2008. Three broadcast spray applications of dimethomorph were done at a 4–8 days interval. The growth stage for the applications varied from BBCH 19 (vegetative) until BBCH 81 (mature bulbs). Duplicate samples of onion bulb were analysed using HPLC-MS/MS Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery was 85.9 ± 11.8% at fortification levels of 0.01–1.0 mg/kg. The results are summarized in Table 15.

Eight residue trials were performed in the USA during growing season 1999. Seven foliar directed applications were done with a 6–8 days interval. The growth stage of the applications varied from vegetative to mature bulbs. Duplicated samples were analysed using HPLV/UV Method FAMS 002/004 approved grapes at the 2007 Meeting. The limit of quantification was 0.01 mg/kg and the recovery was 70–120% at fortification levels of 0.01–0.1 mg/kg. The results are summarized in Table 15.

Table 15 Residues in onion bulbs from foliar application of dimethomorph in field trials in the USA

Head Cabbage Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in bulbs		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment		ind. value	mean	
Critical GAP USA, Canada		0.21–0.23	3		0			
USA (NY) 2008 (Super Star Onion)	SC 500 g	0.227 [a]	3	2.5' bulbs	0 1 3 7 10	0.10 0.10 0.08 0.08 0.09 0.09 0.09 0.12 0.16 0.13	0.10 0.08 0.09 0.11 0.13	2009/7004732 R080022
CAN (MN) 2008 (Candy)	SC 500 g	0.226 [a]	3	vegetative	0 1 3 7 10	0.09 0.07 0.06 0.04 0.03 0.03 0.02 0.02 0.01 0.01	0.08 0.05 0.03 0.02 0.01	2009/7004732 R080023
CAN (KS)	SC	0.226 [a]	3	BBCH 48	0	0.16	0.16	2009/7004732

Head Cabbage Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in bulbs		Reference & Comments
2008 (Candy)	500 g				1 3 7 10	0.15 0.07 0.06 0.08 0.04 0.04 0.05 0.05 0.06	0.07 0.06 0.05 0.06	R080024
CAN (MB) 2008 (Genisis Hybrid)	SC 500 g	0.220 [a]	3	BBCH 47	0 1 3 7 10	0.37 0.40 0.31 0.28 0.21 0.21 0.06 0.05 0.13 0.12	0.38 0.3 0.21 0.06 0.13	2009/7004732 R080025
USA (CA) 2008 (White)	SC 500 g	0.221 [a]	3	Mature	0 1 3 7 10	0.04 0.04 0.06 0.03 0.10 0.11 0.21 0.15 0.02 0.03	0.04 0.05 0.02 0.18 0.03	2009/7004732 R080027
USA (TX) 2008 (Yellow Spanish)	SC 500 g	0.23 [a]	3	Tops falling	0 1 3 7 10	0.16 0.20 0.03 0.11 0.04 0.08 0.02 0.03 0.01 0.02	0.18 0.07 0.06 0.03 0.02	2009/7004732 R080028
USA (CA) 2008 (Southport)	SC 500 g	0.226 [a]	3	2.5[#] bulbs	0 1 3 7 10	0.25 0.26 0.04 0.22 0.29 0.26 0.17 0.14 0.14 0.19	0.26 0.13 0.28 0.155 0.165	2009/7004732 R080029
USA (ID) 2008 (Vaquero)	SC 500 g	0.223 [a]	3	growth complete	0 1 3 7 10	0.05 0.06 0.04 0.05 0.03 0.03 0.02 0.03 < 0.01 0.01	0.06 0.045 0.03 0.025 0.01	2009/7004732 R080030
USA (OR) 2008 (White Sweet Spanish)	SC 500 g	0.230 [a]	3	BBCH 49	0 1	0.05 0.05 0.04 0.03	0.05 0.04	2009/7004732 R080684

Head Cabbage Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in bulbs		Reference & Comments
					3 7 10	0.05 0.19 0.07 0.05 0.07 0.04	0.12 0.06 0.055	
USA (TX) 2008 (Yellow Granex)	SC 500 g	0.23 [a]	3	BBCH 47	0 1 3 7 10	0.24 0.21 0.21 0.20 0.19 0.19 0.13 0.11 0.09 0.09	0.23 0.205 0.19 0.12 0.09	2009/7004732 R080690
USA (CA) 1999 (Early red burger)	WP 500 g	0.225 [b]	7	Mature bulbs	0	0.10 0.22	0.16	2002/7013745 CA 06
USA (CA) 1999 (Reina Blanca)	WP 500 g	0.225 [b]	7	Bulbs formed	0	0.08 0.10	0.09	2002/7013745 CA 07
USA (CO) 1999 (Teton)	WP 500 g	0.225 [b]	7	Mature bulbs	0	0.10 0.12	0.11	2002/7013745 CO 01
USA (ID) 1999 (Vega)	WP 500 g	0.225 [b]	7	Mature bulbs	0	0.03 0.06	0.04	2002/7013745 ID 01
USA (NY) 1999 (Hustler)	WP 500 g	0.225	7	Mature bulbs	0	0.07 0.13	0.10	2002/7013745 NY 02
USA (NY) 1999 (Burgos)	WP 500 g	0.225 [b]	7	Vegetative [c]	0	1.411– 0.220	0.82	2002/7013745 OH 06
USA (OR) 1999 (Santos FI)	WP 500 g	0.225 [b]	7	Mature bulbs	0	0.27 0.28	0.27	2002/7013745 OR 10
USA (TX) 1999 (1015)	WP 500 g	0.225 [b]	7	Mature bulbs	0 3 7	0.07 0.08 0.04 0.05 0.05 0.06	0.08 0.05 0.06	2002/7013745 TX02

[a] With 274–312 L water/ha
[b] With 284–730 L water/ha
[c] Crop height 12"–15"

Leek

Nineteen residue decline trials were conducted in Europe during growing seasons 1999 and 2006. Dimethomorph was applied three times as a foliar spray. The applications were made 34–14 ± 1 days before harvest with a spray interval of 10–11 days.

Samples of leek stems were analysed using LC/MS/MS Method 575/0. The limit of quantification was 0.01–0.02 mg/kg and the recovery was 74–103%. The results are summarized in Table 16.

Table 16 Residues of dimethomorph in leek from field trials conducted in Europe

LEEK Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg) stem ind. value	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment			
Critical GAP France		0.18	2		14		
Germany, 1999 (Lancelot)	WG 9 g	0.18	3	12 leaves	0 7 14 21 28	0.67 0.24 0.08 0.08 0.03	2001/1026153 FR22/06/40
Germany, 2001 (Hiberna)	WG 9 g	0.18	3	2.5–3.0 cm	0 7 14 21 28	0.62 0.44 0.07 0.06 0.03	2002/1019891 01/047
Germany, 2001 (Hiberna)	WG 9 g	0.18	3	mature	14 21	0.05 0.04	2002/1019892 01/048
Germany, 2001 (Florina)	WG 9 g	0.18	3	2 weeks before harvest	0 7 14 21 28	1.6 0.05 < 0.02 < 0.02 < 0.02	2002/1019893 01/090
Germany, 2001 (Amundo)	WG 9 g	0.18	3	43	14 21	< 0.02 < 0.02	2002/1019893 01/091
Germany, 2001 (Werdea)	WG 9 g	0.18	3	2 weeks before harvest.	14 21	0.03 0.02	2002/1019893 01/092
Germany, 2001 (Werdea)	WG 9 g	0.18	3	2 weeks before harvest	14 21	0.04 0.05	2002/1019893 01/093
Northern France, 2005 (Elektra)	WG 9 g	0.18	3	45	0 7 14 21	2.23 0.20 0.10 0.06	2007/1008491 A/NF/F/05/222
Southern France 2005 (Amundo)	WG 9 g	0.18	3	47	0 7 14 21	0.56 1.02 0.69 0.18	2007/1008491 A/SF/F/05/223
Germany, 2005 (Appolo)	WG 9 g	0.18	3	45–49	0 7 15 22	1.42 0.16 0.08 0.07	2007/1008491 A/NF/F/05/224
Belgium, 2005 (Sheltar)	WG 9 g	0.18	3	47–49	0 7 14 21	0.29 0.22 0.04 0.03	2007/1008491 A/NF/F/05/225
The Netherlands, 2005 (Kenton)	WG 9 g	0.18	3	44	0 7 14 21	0.34 0.21 0.11 0.03	2007/1008491 A/NF/F/05/226
Italy, 2005 (Kenton F1)	WG 9 g	0.18	3	46–47	0 7 14 21	0.39 0.54 0.21 0.30	2007/1008491 A/IT/F/05/227
N. France 2006 (Axima)	WG 9	0.18	3	43	0 7 14 21	0.81 0.15 0.10 0.05	2007/1008500 A/NF/F/06/81

LEEK Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg) stem	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment		ind. value	
The Netherlands, 2006 (Kenton)	WG 9 g	0.18	3	47–48	0 7 14 21	0.33 0.08 0.04 0.02	2007/1008500 A/NF/F/06/82
Denmark, 2006 (Pandora)	WG 9 g	0.18	3	49	0 7 14 21	0.46 0.05 < 0.01 0.01	2007/1008500 A/DK/F/06/83
UK, 2006 (Pancho)	WG 9 g	0.18	3	44	0 6 13 21	0.84 0.17 0.13 0.02	2007/1008500 A/UK/F/06/84
Spain, 2006 (Atal)	WG 9 g	0.18	3	46–47	0 6 13 20	0.27 0.39 0.06 0.02	2007/1008500 A/SP/F/06/85
Greece, 2006 (Demycalemy)	WG 9 g	0.18	3	43–46	0 7 14 21	0.88 0.11 0.08 0.05	2007/1008500 A/GR/F/06/86

[a] Spray volumes of 372–600 L/ha

Spring onions

During growing season 2011 three outdoor trials were conducted in the USA. Three broadcast spray applications of dimethomorph were made at a 5–6 days interval. The growth stage for the applications varied within BBCH 41–49 (development of harvestable vegetative plant parts).

Three outdoor residue decline trials were conducted in USA 2008. Three broad cast spray applications of dimethomorph were made at a 4–8 days interval. The growth stage for the applications varied from 12 days before first sampling until growth complete.

Duplicate samples from treated plots were analysed with LC/MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery was 76–114% and 74–93% for the trials from 2011 and 2008 respectively at fortification levels of 0.01–10.0 mg/kg. The results are summarized in Table 17.

Table 17 Residues of dimethomorph in spring onions from field trials conducted in USA

SPRING ONION Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in whole plants		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment		ind. value	mean	
Critical GAP USA, Canada		0.21–0.23	3		0			
USA (OK) 2011 (Walla, Walla)	SC 225 g	0.25 [a]	3	BBCH 43	0 0	1.92 2.78	2.35	2013-7001787 R110160
					1 1	1.97 2.21	2.09	
USA (TX) 2011 (Local sort not specified)	SC 225 g	0.25 [a]	3	BBCH 41	0 0	1.78 3.12	2.45	2013-7001787 R110161
					1 1	2.07 1.99	2.03	

SPRING ONION Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in whole plants		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment		ind. value	mean	
USA (CA) 2011 (Evergreen White)	SC 225 g	0.25 [a]	3	BBCH 49	0 0	1.26 1.28	1.27	2013-7001787 R110162
					1 1	0.88 0.93	0.91	
USA (CA) 2008 (APT 410)	SC 500 g	0.225 [b]	3	Growth complete	0 0	1.34 1.78	1.56	2009/7004732 R080033
					1 1	1.36 1.48	1.42	
					3 3	0.78 0.66	0.72	
					7 7	0.28 0.15	0.22	
					10 10	0.11 0.15	0.13	
USA (CA) 2008 (Southport White)	SC 500 g	0.225 [b]	3	Mature	0 0	1.79 1.79	1.79	2009/7004732 R080034
					1 1	1.73 1.78	1.76	
					3 3	1.46 1.81	1.64	
					7 7	0.79 1.04	0.92	
					10 10	0.72 0.63	0.68	
USA (TX) 2008 (Yellow Granex)	SC 500 g	0.225 [b]	3	BBCH 15	0 0	6.60 4.11	5.36	2009/7004732 R080691
					1 1	3.19 3.28	3.24	
					3 3	2.49 2.78	2.64	
					7 7	0.99 0.85	0.92	
					10 10	0.75 0.69	0.72	

[a] With 187–337 L water/ha
[b] With 278–291 L water/ha

During growing season 1999 four trials were performed on spring onions in the USA. Seven to eight foliar directed spray applications of dimethomorph formulation were made at 5–8 days interval. The growth stage for applications varied within growth stage development of harvestable vegetative plant parts (BBCH 41–49) from vegetative until vegetative (mature).

Duplicate samples (whole vegetable) from treated plots were sampled on the day of seventh application. The samples were analysed with LC/MS/MD using Method 575/0. The limit of quantification was 0.05 mg/kg and the mean recovery was 92–114% at fortification levels of 0.05–5.0 mg/kg. The results are summarized in Table 18.

Table 18 Residues in spring onions from foliar application of dimethomorph in field trials in the USA

SPRING ONION Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues in whole plants		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment		ind. value	mean	
Critical GAP USA		0.21	3		0			
USA (NJ) 1999 (Bunchine)	WP 50	0.225	7	Vegetative mature	0 0	0.641 0.653	0.647	2002/7013746 NJ 05
USA (FL) 1999 (White Spear)	WP 50	0.225	7	Vegetative mature	0 0	0.721 0.776	0.749	2002/7013746 FL 18
USA (WI) 1999 (Evergreen)	WP 50	0.225	7	vegetative	0 0	0.887 0.945	0.915	2002/7013746 WI 24
USA (OR) 1999 (Feast)	WP 50	0.225	7	Mature	0 0	1.21 1.22	1.22	2002/7013746 OR09
			8		0 0	0.862 0.899	0.881	

[a] With 265–474 L water/ha

Head cabbage

Ten field trials were conducted in the USA (nine) and Canada (one) during growing season 2008. Three foliar broadcast applications of dimethomorph) were made with a 5–9 days interval. The growth stage for the applications varied from vegetative stage to mature heads.

Duplicate samples of cabbage heads (including wrapper leaves) were and analysed with LC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery was 108% at fortification levels of 0.01–10.0 mg/kg. The results are summarized in Table 19.

Table 19 Residues in head cabbage (with wrapper) from foliar application of dimethomorph in field trials from the USA

Head Cabbage Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues Head cabbage with wrapper leaves (mg/kg)		Reference & Comments
		kg ai/ha [a]	kg ai/hL	no	Growth stage at last treatment		ind. value	mean	
Critical GAP USA		0.21		3		0			
USA (NY) 2008 (Rocket)	SC 500 g	0.225	0.106	3	mature heads	0 1 3 7 10	0.74 0.97 0.86 0.85 0.21 0.28 0.11 0.08 0.07 0.06	0.86 0.86 0.25 0.095 0.07	2009/7006205 RCN R080068
USA (GA)	SC	0.225	0.107	3	4–8"	0	1.15	1.08	2009/7006205

Head Cabbage Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues Head cabbage with wrapper leaves (mg/kg)		Reference & Comments
2008 (Thunder)	500 g				heads	1 3 7 10	1.01 0.97 0.95 0.45 0.51 012 0.09 0.09 0.08	0.96 0.48 0.11 0.09	RCN R080069
USA (FL) 2008 (White)	SC 500 g	0.225	0.105	3	mature heads	0 1 3 7 10	1.24 1.49 1.28 1.28 0.30 0.27 0.18 0.23 0.14 0.19	1.37 1.28 0.29 0.21 0.17	2009/7006205 RCN R080070
USA (MN) 2008 (Market Pride)	SC 500 g	0.225	0.107	3	vegetative	0 1 3 7 10	0.14 0.13 0.14 0.13 0.15 0.19 0.03 0.05 0.03 0.04	0.14 0.14 0.17 0.04 0.04	2009/7006205 RCN R080071
Canada (QC) 2008 (Stonehead)	SC 500 g	0.225	0.105	3	BBCH 49	0 1 3 7 10	1.54 1.17 1.51 1.51 0.25 0.24 0.22 0.22 0.08 0.13	1.36 1.51 0.25 0.22 0.11	2009/7006205 RCN R080072
USA (WI) 2008 (Artost)	SC 500 g	0.225	0.106	3	BBCH 48	0 1 3 7 10	0.68 1.22 0.90 1.25 0.07 0.08 0.80 0.21 0.13 0.10	0.95 1.08 0.08 0.51 0.12	2009/7006205 RCN R080073
USA (TX) 2008 (Pennant)	SC 500 g	0.225	0.107	3	BBCH 49	0 1 3 7 10	0.91 0.66 1.28 1.15 0.82 1.14 0.20 0.17 0.97 0.27	0.79 1.22 0.51 0.19 0.62	2009/7006205 RCN R080074
USA (KS) 2008 (Stonehead)	SC 500 g	0.225	0.106	3	mature heads	0	3.90 4.61	4.26	2009/7006205 RCN R080075

Head Cabbage Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues Head cabbage with wrapper leaves (mg/kg)		Reference & Comments
						1	4.09 4.21	4.15	
						3	3.23 3.65	3.44	
						7	1.27 1.21	1.24	
						10	0.78 0.62	0.07	
USA (CA) 2008 (Copenhagen)	SC 500 g	0.225	0.110	3	mature heads	0	0.45 0.42	0.44	2009/7006205 RCN R080076
						1	0.48 0.43	0.46	
						3	0.23 0.16	0.19	
						7	0.19 0.16	0.18	
						10	0.09 0.11	0.10	
USA (OR) 2008 (Primo)	SC 500 g	0.225	0.106	3	BBCH 49	0	0.52 0.38	0.45	2009/7006205 RCN R080077
						1	0.23 0.29	0.26	
						3	0.26 0.22	0.24	
						7	0.04 0.05	0.05	
						10	0.03 0.03	0.03	

[a] With 267–295 L water/ha

Broccoli

Ten field trials were conducted in the USA (nine) and Canada (one) during growing season 2008. Three foliar broadcast applications of dimethomorph were applied with a spray interval of 5–9 days. The growth stage for the applications varied from vegetative stage to mature heads.

Duplicate samples of flower heads and stem were and analysed with LC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery was 99% at fortification levels of 0.01–5.0 mg/kg. The results are summarized in Table 20.

Table 20 Residues in broccoli from foliar application of dimethomorph in field trials in the USA

BROCCOLI Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues in flower head (inflorescence) (mg/kg)		Reference & Comments
		kg ai/ha	kg ai/hL	no	Growth stage at last treatment		ind. value	mean	
Critical GAP USA		0.21		3		0			
CAN (QC) 2008 (Packman)	SC 500 g	0.230	0.08	3	BBCH 605	0	1.23 1.64	1.435	2009/7006205 RCN R080058
						1	1.45 1.53	1.49	
						3	0.44 0.34	0.39	
						7	0.16	0.155	

BROCCOLI Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues in flower head (inflorescence) (mg/kg)		Reference & Comments
						10	0.15 0.03 0.02	0.025	
USA (WI) 2008 [a] (Packman)	SC 500 g	0.226	0.08	3	6–10" heads	0 1 3 7 10	1.61 1.62 0.82 1.02 0.53 0.53 0.16 0.14 0.06 0.04	1.62 0.92 0.53 0.15 0.05	2009/7006205 RCN R080059
USA (WI) 2008 (Packman)	SC 500 g	0.240	0.086	3	BBCH 48	0 1 3 7 10	0.93 0.87 0.78 0.81 0.27 0.29 0.20 0.19 0.10 0.11	0.9 0.795 0.28 0.195 0.105	2009/7006205 RCN R080060
USA (CA) 2008 (Green Majic)	SC 500 g	0.221	0.079	3	Mature	0 1 3 7 10	1.82 1.67 1.64 1.24 0.72 0.84 0.38 0.46 0.16 0.22	1.745 1.44 0.78 0.42 0.19	2009/7006205 RCN R080062
USA (CA) 2008 (Marathon)	SC 500 g	0.225	0.08	3	Mature heads	0 1 3 7 10	2.14 1.96 2.62 2.04 1.40 1.46 0.85 0.98 0.79 0.72	2.05 2.33 1.43 0.915 0.755	2009/7006205 R080063
USA (CA) 2008 (Green Magic)	SC 500 g	0.223	0.079	3	Mature heads	0 1 3 7 10	0.71 0.64 0.51 0.36 0.38 0.41 0.15 0.14 0.08 0.12	0.675 0.435 0.395 0.145 0.10	2009/7006205 RCN R080064
USA (AZ) 2008 (Crown Set)	SC 500 g	0.229	0.08	3	Early maturity	0 1 3 7	0.30 0.19 0.23 0.13 0.12 0.12 0.03 0.09	0.245 0.18 0.12 0.06	2009/7006205 RCN R080065

BROCCOLI Country, year (variety)	Form	Application				PHI (days)	Dimethomorph Residues in flower head (inflorescence) (mg/kg)		Reference & Comments
						10	0.03 0.08	0.55	
USA (CA) 2008 (Greenbelt)	SC 500 g	0.227	0.081	3	BBCH 49	0 1 3 7 10	1.87 1.89 1.64 1.41 1.41 0.99 0.85 0.77 0.66 0.50	1.88 1.525 1.2 0.81 0.58	2009/7006205 RCN R080066
USA (OR) 2008 (Emerald Pride)	SC 500 g	0.226	0.079	3	BBCH 47	0 1 3 7 10	0.98 0.91 0.74 0.71 0.07 0.11 0.04 0.05 < 0.01 0.03	0.945 0.725 0.09 0.045 0.02	2009/7006205 RCN R080067
USA (TX) 2008 (Marathon)	SC 500 g	0.223	0.084	3	BBCH 49	0 1 3 7 10	0.84 0.64 0.59 0.53 0.47 0.72 0.31 0.26 0.12 0.15	0.74 0.56 0.595 0.285 0.135	2009/7006205 RCN R080685

[a] With 267–295 L water/ha

Pepper (bell and non-bell)

Twelve outdoor trials on bell peppers and non-bell peppers were conducted in the USA during growing seasons 1998 and 1999. Seven foliar broadcast applications of dimethomorph were made with a 4–15 days interval. The growth stage for the applications was from vegetative (5–16 cm) to mature heads. Three of the trials were decline trials.

Duplicate samples were analysed using GC-ECD method FAMS 002-04. The average procedural recovery range for dimethomorph was (95–119%) at the fortification level of 0.025–5 mg/kg and the limit of quantification was 0.025 mg/kg. The results are summarized in Table 21.

Table 21 Residues in pepper (bell and non-bell) from outdoor foliar application of dimethomorph in trials in USA

PEPPER Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg) fruit		Reference & Comments
		kg ai/ha [d]	Growth stage at last treatment	no		ind. value	mean	
Critical GAP Canada		0.225		5	0			
USA (NJ) 1999 (bell, Bell Captain)	WP 500 g	0.225	Mature fruit	7	0	0.125 0.126	0.126	2002/7013750 NJ01
USA (NJ) 1998	WP	0.225	Mature	7	6 [a]	0.165	0.179	2002/7013750

PEPPER Country, year	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg) fruit		Reference & Comments
(bell King Arthur)	500 g		fruit			0.192		NJ10
USA (GA) 1998 (bell, Camelot)	WP 500 g	0.225	Mature fruit	7	0 0	0.429 0.526 0.753 0.921	0.478 [b] 0.837 [c]	2002/7013750 GA 08
USA (GA) 1998 (non-bell, Mesilla)	WP 500 g	0.225	Mature fruit	7	0	0.884 1.205	1.045	2002/7013750 GA 09
USA (FL) 1998 (bell, Camelot)	WP 500 g	0.225	Mature fruit	7	0 7	0.084 0.088 0.035 0.061	0.057 0.048	2002/7013750 FL 26
USA (FL) 1998 (non-bell, Jalapeno)	WP 500 g	0.225	Mature fruit	7	0	0.078 0.081	0.08	2002/7013750 FL 27
USA (OH) 1998 (bell, King Arthur)	WP 500 g	0.225	Fruiting	7	0	< 0.025 0.044	0.035	2002/7013750 OH 03
USA (TX) 1998 (bell, Capistrano)	WP 500 g	0.225	Mature fruit	7	0 7	0.107 0.110 0.027 0.030	0.109 0.029	2002/7013750 TX 09
USA (TX) 1998 (bell, TAM Veracruz)	WP 500 g	0.225	Mature fruit	7	0	0.660 0.730	0.695	2002/7013750 TX 10
USA (CA) 1998 (bell, Valiant)	WP 500 g	0.225	Fruiting	7	0	0.130 0.134	0.132	2002/7013750 CA 23
USA (CA) 1998 (bell, Indra)	WP 500 g	0.225	Mature fruit	7	0 6	0.137 0.144 0.163 0.166	0.141 0.165	2002/7013750 CA 27
USA (CA) 1998 (non-bell, Rogers Jalapone M)	WP 500 g	0.225	Mature fruit	7	0	0.211 0.296	0.254	2002/7013750 CA 28

[a] At the NJ10 trial samples were collected at 6 days after last application, the 0 day was lost due to freezer failure. This trial was repeated the following year (NJ01)
[b] Harvested after six applications, because the peppers were ripening faster than expected and the fruit was not expected to last for the 7th application
[c] Harvested after seven applications. At the 7th application there was sufficient fruit for a good harvest and a sample good be taken
[d] Spray volumes of 275–625 L/ha

Tomato

Twelve outdoor trials on tomato were evaluated by JMPR 2007. Results from those trials are presented in Table 22 below.

Table 22 Residues in tomato from outdoor foliar application of dimethomorph in trials in the USA

TOMATO Country, year (variety)	Form	Application			Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha	no	PHI (days)	fruit	
Critical GAP Canada		0.225	5	0		
USA (CA) 1995 (Flaver saver Calgene)	WP 500 g	0.22	6	0 3 7 14 21	0.07 < 0.05 0.06 < 0.05 0.05	DK-723-028
USA (CA) 1995 (Heniz 8892)	WP 500 g	0.22	6	0 3 7	0.2 0.41 0.22	DK-723-031

TOMATO Country, year (variety)	Form	Application			Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha	no	PHI (days)	fruit	
USA (CA) 1995 (Peach Mech)	WP 500 g	0.22	6	0 3 7	0.38 0.26 0.16	DK-723-030
USA (CA) 1995 (Shady Lady)	WP 500 g	0.22	6	0 3 7 14 21	0.11 0.08 0.06 0.05 < 0.05	DK-723-029
USA (TE) 1995 (Better Boy)	WP 500 g	0.22	6	0 3 7 14 21	0.14 0.21 0.17 < 0.05 < 0.05	DK-723-027
USA (CA) 1998 (Rio Grande)	WP 90 g	0.22	6	0 3 7	0.06 0.05 < 0.05	DK-723-034
USA (CA) 1998 (Celebrity)	WP 90 g	0.22	7	0 3 7	0.35 0.51 0.35	DK-723-043
USA (CA) 1998 (Roma Hybrid 882)	WP 90 g	0.22	7	0 3 7	0.13 0.14 0.1	DK-123-249
USA (CA) 1998 (Sun 6200)	WP 90 g	0.22	7	0 3 7	0.3 0.14 0.09	DK-723-048
USA (FL) 1996 (Agriset)	WP 90 g	0.22	7	0 3 7	< 0.05 < 0.05 < 0.05	DK-723-032
USA (PE) 1996 (La Roma)	WP 90 g	0.22	7	0 3 7	< 0.05 < 0.05 < 0.05	DK-723-036
USA (SC) 1996 (Celebrity)	WP 90 g	0.22	7	0 3 7	0.06 < 0.05 < 0.05	DK-723-035

Lettuce, head

Eight outdoor residue decline trials from the USA (seven) and Canada (one) in lettuce head were conducted during growing season 2008. Dimethomorph was applied three times as a foliar broadcast spray and a spray interval of 4–8 days. The timing of the applications was from head development until mature heads. Duplicate samples (fresh heads with wrappers leaves) were analysed with HPLC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery 75% at fortification levels from 0.01–20.0 mg/kg. The results are summarized in Table 23.

In six similar trials from the USA made in during the growing season of 1998, dimethomorph was applied seven to eight times as foliar spray with a spray interval of 5 to 11 days. Mature heads were analysed using GC-ECD and Method FAMS 002-04. The limit of quantification was 0.025 mg/kg and the mean recovery 101 ± 15 fortification level from 0.025–10 mg/kg. The results are summarized in Table 24.

Table 23 Residues in outdoor lettuce head from foliar application of dimethomorph in trials from the USA

LETTUCE, HEAD Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg [b] ai/ha	no	Growth stage at last treatment		Heads, Fresh with wrapper leaves		
						individual value	average value	
Critical GAP USA	SC	0.19	3		0			
USA (NY) 2008 (Ithaca MTP)	SC 250 g/L	0.225	3	BBCH 49 Mature Heads	0 0 1 1 3 3 7 7 10 10	1.42 1.29 1.22 1.17 0.21 [a] 0.13 [a] 0.05 0.1 0.04 0.05	1.355 1.195 0.17 0.03 0.045	2009/7003324 RCN R080224
USA (FL) 2008 (Great Lakes)	SC 250 g/L	0.225	3	BBCH 49 Mature Heads	0 0 1 1 3 3 7 7 10 10	2.49 3.14 2.91 2.83 2.23 1.62 0.89 1.06 0.69 0.48	2.815 2.87 1.925 0.975 0.082	2009/7003324 RCN R08025
USA (WI) 2008 (Fall Green MTO)	SC 250 g/L	0.225	3	Small medium heads	0 0 1 1 3 3 7 7 10 10	1.77 1.07 1.09 1.13 0.17 0.07 0.08 0.08 0.05 0.05	1.420 1.110 0.12 0.08 0.05	2009/7003324 RCN R080226
CA (QC) 2008 (Grand Rapid)	SC 250 g/L	0.225	3	BBCH 47 (70% of expected head size)	0 0 1 1 3 3 7 7 10 10	2.09 2.02 1.47 2.30 0.51 0.50 0.39 0.29 0.20 0.15	2.055 1.885 0.505 0.34 0.175	2009/7003324 RCN R080227
USA (CA) 2008 (Sidewinter)	SC 250 g/L	0.225	3	Head development	0 0 1 1 3 3 7 7 10 10	4.10 4.09 3.77 3.22 2.91 2.79 3.52 3.78 2.83 2.02	4.095 3.495 2.85 3.65 2.425	2009/7003324 RCN R080228
USA (CA) 2008 (Great Lakes 659)	SC 250 g/L	0.225	3	BBCH 49 Mature Heads	0 0 1 1 3	2.43 2.16 1.17 0.69 0.52	2.295 0.93 0.52	2009/7003324 RCN R08029

LETTUCE, HEAD Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg [b] ai/ha	no	Growth stage at last treatment		Heads, Fresh with wrapper leaves		
						individual value	average value	
					3 7 7 10 10	0.52 0.11 [a] 0.23 [a] 0.14 0.17	0.17 0.155	
USA (CA) 2008 (Tellmark)	SC 250 g/L	0.225	3	Heading	0 0 1 1 3 3 7 7 10 10	1.61 1.83 1.62 1.23 0.78 0.97 0.20 0.34 0.45 [a] 0.31 [a]	1.72 1.425 0.875 0.27 0.38	2009/7003324 RCN R08030
USA (CA) 2008 (Telluride)	SC 250 g/L	0.225	3	BBCH 49 Mature Heads	0 0 1 1 3 3 7 7 10 10	1.23 1.19 1.07 1.08 0.84 0.84 0.3 0.24 0.21 0.26	1.21 1.075 0.84 0.27 0.235	2009/7003324 RCN R08031

[a] Mean of multiple analysis of the same field sample.
[b] Spray volumes of 279–295 L/ha

Table 24 Residues in outdoor lettuce head from foliar application of dimethomorph in trials from the USA

LETTUCE, HEAD Country, year (variety)	Form	Application			PHI (days)	Heads Fresh with wrapper leaf		Heads Fresh without wrapper leaf	2001/50033 06
		kg [a] ai/ha	no	Growth stage at last treatment		individ. value	mean		
Critical GAP USA	SC	0.19	3		0				
USA (CA) 1998 (Winterhaven M.I.)	WP 50	0.199	7	Mature Heads	0 2 2 7 7 14 14	4.372 1.091 1.159 0.672 1.033 0.453 0.521	 1.125 0.853 0.487 	0.441	2001/50033 06 CA 113
USA (FL) 1998 (Crispino)	WP 50	0.198	7	Beginning to bolt	0 3 3 7 7 14 14	3.634 0.446 0.551 0.198 0.247 0.030 0.018	 0.499 0.223 0.024 	0.198	2001/50033 06 FL 67
USA (TN) 1998 (cultivar not stated)	WP 50	0.203	7	Mature Heads	0	6.447		0.638	2001/50033 06 TN 08
USA (CA) 1998 (251)	WP 50	0.200	7	Mature Heads	0	1.076		0.080	2001/50033 06

LETTUCE, HEAD Country, year (variety)	Form	Application			PHI (days)	Heads Fresh with wrapper leaf		Heads Fresh without wrapper leaf	2001/50033 06
		kg [a] ai/ha	no	Growth stage at last treatment		individ. value	mean		
Critical GAP USA	SC	0.19	3		0				
									CA 116
USA (CA) 1998 (Salinas, M.1.)	WP 50	0.200	8	Mature Heads	0	1.454		0.247	2001/50033 06 CA 117
USA (CA) 1998 (Great Lake 659)	WP 50	0.200	7	Mature Heads	0	1.675		0.046	2001/50033 06 CA 118

[a] Spray volumes of 285–380 L/ha

Lettuce, leaf

Nine field trials were conducted in USA in during growing season 2008. Dimethomorph was applied three times as a foliar broadcast spray and intervals of 4–8 days. The growth stage for the applications varied from vegetative stage until BBCH 49. Duplicate samples of mature leaves were sampled and analysed with HPLC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery 75% at fortification levels from 0.01–20.0 mg/kg. The results are summarized in Table 25.

Nine field trials were conducted in the USA during growing season 1998. Dimethomorph was applied seven times as foliar spray at 0.2 kg ai/ha and spray interval of 3–6 days. Duplicate samples of leaves were analysed with GC-ECD using Method FAMS 002-04. The limit of quantification was 0.1 mg/kg and the mean recovery 98 ± 8 fortification level from 0.1–10 mg/kg. The results are summarized in Table 25.

Table 25 Residues in outdoor lettuce from foliar application of dimethomorph in trials from the USA

LETTUCE Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg ai/ha	Growth stage at last treatment	no		Leaves		
						individual value	average value	
Critical GAP USA	SC	0.19		3	0			
USA (GA) 2008 (Italien Isher)	SC 250 g/L [a]	0.225	7–10`	3	0 1 3 7 10	6.05 5.60 1.31 1.25 0.46 0.39 0.18 0.14 0.05 0.07	5. 83 1.28 0. 43 0.16 0.60	2009/7003324 RCN R080215
USA (FL) 2008 (Bibb)	SC 250 g/L [a]	0.225	vegetative	3	0 1 3 7 10	4.78 5.60 4.48 4.29 2.52 2.41 0.93 0.55 0.34 0.23	5.19 4.39 1.26 0.74 0.29	2009/7003324 RCN R080216
USA (WI) 2008 (Black Seeded	SC 250 g/L [a]	0.225	vegetative	3	0	10.42 [c] 9.11 [c]	9.77	2009/7003324 RCN R080217

LETTUCE Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg ai/ha	Growth stage at last treatment	no		Leaves		
						individual value	average value	
Simpson)					1 3 7 10	7.38 7.81 1.22 1.17 0.43 0.51 0.20 0.27	7.6 1.2 0.47 0.24	
USA (QC) 2008 (Great Leak)	SC 250 g/L [a]	0.225	BBCH 49 (typical leaf mass reached)	3	0 1 3 7 10	3.69 3.67 0.47 0.41 0.26 0.26 0.16 0.16 0.11 0.11	3.68 0.44 0.26 0.16 0.11	2009/7003324 RCN R080218
USA (CA) 2008 (Tohema)	SC 250 g/L [a]	0.225	mature	3	0 1 3 7 10	10.53 9.22 8.68 10.7 8.92 9.81 9.24 10.09 5.94 6.85	9.88 9.69 9.37 9.67 6.39	2009/7003324 RCN R080219
USA (CA) 2008 (Salad Bowl)	SC 250 g/L [a]	0.225	24 leaves	3	0 1 3 7 10	2.15 2.04 3.48 2.44 2.20 3.11 1.09 0.91 0.7 [c] 0.36 [c]	2.09 2.96 3.16 1.00 0.53	2009/7003324 RCN R08020
USA (CA) 2008 (Butter Crunch)	SC 250 g/L [a]	0.225	7–9 leaves	3	0 1 3 7 10	3.44 3.29 2.85 2.83 2.43 2.67 1.67 1.35 0.48 0.50	3.37 2.84 2.55 1.01 0.49	2009/7003324 RCN R08021
USA (CA) 2008 (Sunbelt)	SC 250 g/L [a]	0.225	8–11 leaves	3	0 1 3 7 10	4.68 4.53 3.56 3.60 0.47 0.43 0.09 0.08 0.06 0.05	4.61 3.58 0.45 0.09 0.55	2009/7003324 RCN R08022
USA (OR) 2008 (Red Sails)	SC 250 g/L [a]	0.225	BBCH 49 (typical	3	0	5.10 5.66	5.38	2009/7003324 RCN R08023

LETTUCE Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg ai/ha	Growth stage at last treatment	no		Leaves		
						individual value	average value	
			leaf mass reached)		1 3 7 10	3.52 3.66 0.95 1.23 0.58 0.57 0.37 0.56	3.59 1.09 2.57 0.37	
USA (CA) 1998 (Green Vision)	WP 50 [b]	0.198	Mature Leaves	7	0	2.7 3.4	3.1	2001/5003305 CA 25
USA (CA) 1998 (Paris Island, Cos M.1.)	WP 50 [b]	0.2	Mature Leaves	7	0	6.6 8.0	7.3	2001/5003305 CA 26
USA (CA) 1998 (Waldman´s Green M1)	WP 50 [b]	0.199	Mature Leaves	7	0	5.6 6.3	5.95	2001/5003305 CA 114
USA (CA) 1998 (Waldman´s Green M1)	WP 50 [b]	0.201	Mature Leaves	7	0	4.9 5.3	5.1	2001/5003305 CA 115
USA (FL) 1998 (Romaine)	WP 50 [b]	0.201	Beginning to bolt	7	0	6.8 7.2	7.0	2001/5003305 FL 25
USA (NY) 1998 (New Red Fire MTO)	WP 50 [b]	0.2	Mature Leaves	7	0	3.0 4.1	3.55	2001/5003305 NY 08
USA (OR) 1998 (Paris Island Cos)	WP 50 [b]	0.199	Mature Leaves	7	0	3.3 3.5	3.4	2001/5003305 OR 09
USA (TX) 1998 (Black Seed Simpson)	WP 50 [b]	0.199	Vegetative	7	0	8.6 9.1	8.85	2001/5003305 TX 08
USA (TX) 1998 (Paris Island Cos	WP 50	0.199	Mature Leaves	7	0 3 7 12	2.6 3.1 2.4 2.5 1.1 1.2 0.16 0.31	2.85 2.45 1.15 0.24	2001/5003305 TX 26

[a] Spray volumes of 270–301 L/ha
[b] Spray volumes of 285–740 L/ha
[c] Mean of multiple analysis of the same field sample.

Spinach

Eight field trials were conducted in the USA in during growing season 2008. Dimethomorph was applied three times as a foliar broadcast spray and spray intervals of 4–8 days. The timing of the applications was from 6–8 leaves until BBCH 49. Duplicate samples of mature leaves were analysed with LC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery 75% at fortification levels from 0.01–20.0 mg/kg. The results are summarized in Table 26.

Table 26 Residues in outdoor spinach from foliar application of dimethomorph in trials from the USA

SPINACH Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg	no	Growth stage		Leaves	

		ai/ha		at last treatment		individual value	average value	
Critical GAP USA	SC	0.19	3		0			
USA (NY) 2008 (Melody)	SC 250 g/L [b]	0.225	3	plants close to maturity	0 0 1 1 3 3 7 7 10 10	6.01 5.8 1.24 1.19 0.65 0.68 0.38 0.39 0.16 0.19	5.91 1 22 0.67 0.39 0.18	2009/7003324 RCN R080232
USA (GA) 2008 (Space FI)	SC 250 g/L [b]	0.225	3	9–16 leaves	0 0 1 1 3 3 7 7 10 10	8.59 7.83 6.13 7.22 2.25 [a] 1.91 [a] 0.02 0.02 < 0.01 < 0.01	8.21 6.68 2.44 0.02 < 0.01	2009/7003324 RCN R08033
USA (WI) 2008 (Unipack 151)	SC 250 g/L [b]	0.225	3	15–20 cm	0 0 1 1 3 3 7 7 10 10	11.04 11.47 8.43 8.10 3.11 3.17 0.52 0.59 0.20 0.21	11.26 8.27 3.14 0.56 0.21	2009/7003324 RCN R080234
USA (QC) 2008 (Tyee)	SC 250 g/L [b]	0.225	3	BBCH 51	0 0 1 1 3 3 7 7 10 10	5.19 4.20 2.17 2.13 0.67 0.76 0.21 0.23 0.08 0.09	4.69 2.15 0.72 0.22 0.09	2009/7003324 RCN R080235
USA (TX) 2008 (Siena)	SC 250 g/L [b]	0.225	3	BBCH 49	0 0 1 1 3 3 7 7 10 10	9.32 7.37 7.21 6.01 6.78 6.34 3.98 3.89 2.02 2.24	8.35 6.61 6.56 3.94 2.13	2009/7003324 RCN R080236
USA (ID) 2008 (Unipack 151)	SC 250 g/L [b]	0.225	3	BBCH 48	0 0 1 1 3 3 7 7 10 10	8.47 8.48 7.39 7.19 6.28 6.36 1.25 1.33 0.23 0.20	8.48 7.29 6.32 1.29 0.22	2009/7003324 RCN R08037
USA (CA) 2008	SC	0.225	3	30.5 cm	0	9.67	10.18	2009/7003324

SPINACH Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment		Leaves		
						individual value	average value	
(Crocodile)	250 g/L [b]				0 1 1 3 3 7 7 10 10	10.69 9.72 7.55 8.44 9.71 8.30 9.17 3.43 3.13	 8.64 9.08 8.74 3.28	RCN R08038
USA (OR) 2008 (Avenger)	SC 250 g/L [b]	0.225	3	BBCH 49	0 0 1 1 3 3 7 7 10 10	5.97 4.63 0.74 0.80 0.69 0.56 0.10 0.10 0.07 0.06	5.30 0.77 0.63 0.10 0.07 	2009/7003324 RCN R08039

[a] Mean of multiple analysis of the same field sample.
[b] Spray volumes of 274–275 L/ha.

Taro, leaf

Three field trials on taro were conducted in Hawaii during growing season 2000. Dimethomorph was applied seven times as a foliar spray (spray interval of 7 to 8 days) or drip irrigation.

Duplicate samples of leaves were analysed using GC-ECD and Method FAMS 002-04. The limit of quantification was 0.01 mg/kg and the recovery 76–119% at fortification level 0.01–10 mg/kg for leaves. The results are summarized in Table 27.

Table 27 Residues in outdoor Taro from foliar application of dimethomorph in trials from the USA

TARO Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment		Leaves	
Critical GAP USA, except California		0.19	5		7		
USA (HI) 2000 (Chinese)	WP 500 g	0.225 [b]	7	vegetative, 1.83 m	7	3.65 5.40 mean 4.525	2003/7010215 IR-4 PR 07335 H109
USA (HI) 2000 (Chinese - 'Bun Long')	WP 500 g	0.225	7	vegetative 1.53 m	7	1.78 1.49 mean 1.63	2003/7010215 IR-4 PR 07335 H110
USA (HI) 2000 (Chinese - 'Bun Long')	WP 500 g	0.225	7	vegetative 1.83 m	0 28	0.633 2.24 mean 1.437	2003/7010215 IR-4 PR 07335 H11

[a] Spray volumes of 1400–1900 L/ha
[b] Drip irrigation

Legume vegetables

Pea, Shelled, (succulent seed)

Two field trials were conducted in France and Germany during the growing season of 2005. Dimethomorph was applied as foliar broadcast application two times 29 and 21± 1 day before harvest. Samples of peas were analysed by LC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and recovery 79–89% for peas with pods and 83–96% for rest of plants without roots at fortification level 0.01–10 mg/kg. The results are summarized in Table 28.

During the growing season of 2006 ten field trials were conducted on green peas in Spain, France (north and south), Germany, the Netherlands and Denmark. Dimethomorph was applied as foliar broadcast application two times 29 and 21± 1 day before harvest. Samples were analysed using LC-MS/MS and Method 575/0. The limit of quantification was 0.01 mg/kg and recovery 83–95% for peas with pods and 80–97% for rest of plants without roots at fortification level 0.01–10 mg/kg. The results are summarized in Table 28.

Table 28 Residues in Green Peas from foliar application of dimethomorph in field trials in Europe

GREEN PEAS Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment BBCH				
Critical GAP France		0.18	2		21			
France, 2005/6 (Barely)	WG 90 g/kg	0.180	2	71	0	peas with pods	0.615	2006/1032765 05 CL FR P37
					0	rest of plant w/o roots	7.032	
					13	fresh peas w/o pods	< 0.01	
					13	rest of plant w/o roots	5.167	
					20	fresh peas w/o pods	< 0.01	
					20	rest of plant w/o pods	3.583	
					28	fresh peas w/o roots	0.023	
					28	rest of plant w/o pods	4.973	
Germany 2005/6 (Trompet)	WG 90 g/kg	0.180	2	67	0	peas with pods	1.175	2006/1032765 AC/05/100
					0	rest of plant w/o pods	4.186	
					14	fresh peas w/o pods	< 0.01	
					14	rest of plant w/o roots	0.511	
					20	fresh peas w/o pods	< 0.01	
					20	rest of plant w/o roots	1.060	

GREEN PEAS Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment BBCH				
					27	fresh peas w/o pods	< 0.01	
					27	rest of plant w/o roots	1.884	
Spain, 2006 (Jumbo)	WG 90 g/kg	0.18	2	73	0	peas with pods	0.568	2007/1005061 06ES/094R
					0	rest of plant w/o roots w/o pods	4,95	
					13	fresh peas w/o pods	< 0.01	
					13	rest of plant w/o roots	2,96	
					20	fresh peas w/o pods	< 0.01	
					20	rest of plant w/o roots	2.03	
					28	fresh peas w/o pods	< 0.01	
					28	rest of plant w/o roots	5.45	
Spain, 2006 (Argona)	WG 90 g/kg	0.18	2	73	0	peas with pods	0.324	2007/1005061 06ES/095R
					0	rest of plant w/o roots w/o pods	3.35	
					14	fresh peas w/o pods	< 0.01	
					14	rest of plant w/o roots	0.575	
					21	fresh peas w/o pods	< 0.01	
					21	rest of plant w/o roots	0.620	
					28	fresh peas w/o pods	< 0.01	
					28	rest of plant w/o roots	1.57	
France, 2006 (Frediro)	WG 90 g/kg	0.18	2	75	0	peas with pods	0.447	2007/1005061 06FR/096R
					0	rest of plant w/o roots w/o pods	3.65	
					14	fresh peas w/o pods	< 0.01	
					14	rest of plant w/o roots	0.368	
					21	fresh peas w/o pods	< 0.01	
					21	rest of plant w/o roots	0.311	
					28	fresh peas w/o pods	< 0.01	
					28	rest of plant	0.588	

GREEN PEAS Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment BBCH				
						w/o roots		
France, 2006 (Frediro)	WG 90 g/kg	0.18	2	75	0	peas with pods	0.358	2007/1005061 06FR/097R
					0	rest of plant w/o roots w/o pods	2.86	
					14	fresh peas w/o pods	< 0.01	
					14	rest of plant w/o roots	0.836	
					21	fresh peas with pods	< 0.01	
					21	rest of plant w/o roots	1.59	
					28	fresh peas w/o pods	< 0.01	
					28	rest of plant w/o roots	0.874	
France, 2006 (Cepia)	WG 90 g/kg	0.18	2	71	0	peas with pods	0.505	2007/1005061 06FR/098R
					0	rest of plant w/o pods w/o roots	6.130	
					15	fresh peas w/o pods	< 0.01	
					15	rest of plant w/o roots	0.0929	
					21	fresh peas w/o pods	< 0.01	
					21	rest of plant w/o roots	1.521	
					27	fresh peas w/o pods	< 0.01	
					27	rest of plant w/o roots	2.400	
Germany, 2006 (Wunder von Kelvedon)	WG 90 g/kg	0.18	2	73	0	peas with pods	0.337	2007/1005061 06FR/099R
					0	rest of plant w/o pods w/o roots	4.28	
					15	fresh peas w/o pods	< 0.01	
					15	rest of plant w/o roots	4.79	
					20	fresh peas w/o pods	0.063	
					20	rest of plant w/o roots	4.18	
					27	fresh peas w/o pods	< 0.041	
					27	rest of plant w/o roots	4.60	
The Netherlands, 2006	WG 90 g/kg	0.18	2	73	0	peas with pods	0.351	2007/1005061 06FR/100R

GREEN PEAS Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment BBCH				
(Wunder von Kelvedon)								
					0	rest of plant w/o pods w/o roots	3.39	
					13	fresh peas with pods	0.015	
					13	rest of plant w/o roots	8.09	
					20	fresh peas w/o pods	0.044	
					20	rest of plant w/o roots	9.53	
					27	fresh peas w/o pods	0.025	
					27	rest of plant w/o roots	9.58	
Denmark, 2006 (Progress no 9 Lot ZP1065)	WG 90 g/kg	0.18	2	73	0	peas with pods	0.662	2007/1005061 06FR/101R
					0	rest of plant w/o pods w/o roots	3.52	
					13	fresh peas with pods	< 0.01	
					13	rest of plant w/o roots	0.242	
					22	fresh peas w/o pods	< 0.01	
					22	rest of plant w/o roots	0.353	
					28	fresh peas w/o pods	< 0.01	
					28	rest of plant w/o roots	0.420	

[a] Spray volumes of 285–300 L/ha.

Vining peas

During the growing season of 2008 four field trials were conducted on vining peas in Northern France, Germany and the Netherlands. Dimethomorph was applied as a foliar broad cast application two times 29 ± 1 and 21 ± 1 days before harvest. Samples (peas with pods and rest of plant w/o roots) were collected directly after the second application. Samples of pods and seed were taken at and 20 ± 1 day after the last treatment. Pea seeds were analysed using LC-MS/MS and the Method 535/1. The limit of quantification was 0.01 mg/kg and the recovery 72–110% for the different samples (n2) at fortification levels 0.01–10 mg/kg. The results are summarized in Table 29.

Table 29 Residues in Vining peas from foliar application of dimethomorph in field trials from Europe

VINING PEAS Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment BBCH				
Critical GAP France		0.18	2		21			
France, 2008 (Caribou)	WG 90 g/kg	0.180 0.187	2	62 71	0	peas with pods	0.768	2009/1069170 A8096 BM1
					0	rest of plant without roots	3.416	
					20	seeds (manual)	< 0.01	
					20	pods	0.021	
					20	seeds (mechanical)	< 0.01	
France, 2008 (Louvette)	WG 90 g/kg	0.207 0.208	2	74 75	0	peas with pods	0.983	2009/1069170 A8096 OB1
					0	rest of plant without roots	9.327	
					20	seeds (manual)	0.016	
					20	pods	0.237	
					20	seeds (mechanical)	0.071	
Germany, 2008 (Esprit)	WG 90 g/kg	0.196 0.205	2	73 75	0	peas with pods	0.372	2009/1069170 A8096 DE1
					0	rest of plant without roots	2.323	
					21	seeds (manual)	< 0.01	
					21	pods	< 0.01	
					21	seeds (mechanical)	< 0.01	
The Netherlands, 2008 (Arlette)	WG 90 g/kg	0.202 0.202	2	73 75	0	peas with pods	0.506	2009/1069170 A8096 NL1
					0	rest of plant without roots	3.234	
					22	seeds (manual)	< 0.01	
					22	pods	0.011	
					22	seeds (mechanical)	< 0.01	

[a] Spray volumes of 200 L/ha

Lima Beans

During the 2002 and 2003 growing season seven field trials on Lima beans were conducted in the USA. Dimethomorph was applied as a foliar broad cast spray seven times with an interval of 5–11 days. Duplicate samples were analysed using GC-MSD and the Method FAMS 002-04 approved for grapes the 2007 Meeting. The limit of quantification was 0.01 mg/kg and the recovery 71–123% for the different samples at fortification levels 0.01–1 mg/kg. The results are summarized in Table 27.

During the growing season 2010 three field trials on Lima Beans was conducted in the USA. Dimethomorph was applied as foliar broad cast spray five to six times with an interval of 6–8 days. Duplicate samples were collected (pods) at the same day as the last application and frozen within 30 minutes. The lima beans were analysed with GC-MSD using Method FAMS 002-04. The limit of quantification was 0.01 mg/kg and the recovery 85–102% for the different samples at fortification levels 0.01–1 mg/kg. The results are summarized in Table 30.

Table 30 Residues in Lima beans from foliar application of dimethomorph in field trials from the USA

LIMA BEANS Country, year (variety)	Form	Application			PHI (days)	Commodity succulent seed without pod	Residues (mg/kg)		Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment			ind. value	mean	
Critical GAP USA		0.19	5		0				
USA, 2002/3 (GA) (Cangreen)	WP 50%	0.225	7	mature	0	bean mechanical	0.48	0.465	2007/7016820 GA10
					0		0.45		
USA, 2002/3 (GA) (Henderson Bush)	WP 50%	0.225	8	fruiting	0	bean mechanical	0.03	0.03	2007/7016820 GA11
					0		0.03		
USA, 2002/3 (GA) (Jackson Wonder)	WP 50%	0.225	7	mature	0	bean mechanical	0.09	0.1	2007/7016820 GA12
					0		0.11		
					3	bean mechanical	0.04	0.045	
					3		0.05		
					5	bean mechanical	0.01	0.01	
					5		0.01		
					11	bean mechanical	0.02	0.02	
					11		0.02		
USA, 2002/3 (MD) (Fordhook 242)	WP 50%	0.225	7	mature	0	bean mechanical	0.21	0.21	2007/7016820 MD 14
					0		0.21		
USA, 2003 (MD) (Burpee Improved Bush)	WP 50%	0.225	7	mature	0	bean mechanical	0.03	0.03	2007/7016820 MD 03
					0		0.03		
USA, 2003 (NJ) (Bridgeton)	WP 50%	0.225	7	fruiting	0	bean mechanical	0.05	0.05	2007/7016820 NJ07
					0		0.05		
USA, 2002/3 (MD) (Improved Kingston)	WP 50%	0.225	7	fruiting	0	bean manual	0.03	0.03	2007/7016820 WI 33
					0		0.03		
USA, 2010 (CA) (Luna Baby Lima Beans)	WP [b] 50%	0.225	5	Pods Setting	0	bean manual	0.0245	0.0257	2013/1335899 CA 140
							0.0268		
	SC [b] 500 g/L		5	Pods Setting	0	bean manual	0.0199	0.0218	
							0.0236		
USA, 2010 (MD) (Eastland)	WP [b] 50%	0.225 [b]	6	Pods filling out, Some Mature	0	bean manual	0.0329	0.0403	2013/1335899 MD19
							0.0476		
	SC [b] 500 g/L		6	Pods filling out, Some Mature	0	bean manual	0.0585	0.0593	
							0.0601		
USA, 2010 (SC) (Fordhook # 242)	WP [b] 50%	0.225 [b]	5	Fruiting	0	bean manual	0.0954	0.0778	2013/1335899 SC18
							0.0602		
	SC [b] 500 g/L		5	Fruiting	0	bean manual	0.0587	0.0623	
							0.0659		

[a] Spray volume of 284–488 L/ha
[b] Adjuvant used

Root and vegetable crop

Ginseng

Four outdoor trials were conducted in the USA during growing season 2004. Dimethomorph was applied seven times from blooming until berries dropping. In three trials dimethomorph was applied as a broadcast foliar spray and in one trial via drip application.

Duplicate samples were analysed using Method FAMS 073-03 to measure dimethomorph residues in ginseng roots. The limit of quantification of this method was 0.08 mg/kg and the mean recover y was 87.3–96.9% at fortification levels of 0.05–5 mg/kg. The results are summarized in Table 31.

Table 31 Residues in outdoor Ginseng from foliar application of dimethomorph in trials from the USA

Ginseng Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)		Reference & Comments
		kg ai/ha	no	Growth stage at last treatment			ind. value	mean	
Critical GAP USA		0.19	5		14				
USA, 2004 (MI) (American Ginseng)	WP [a] 50%	0.270 [a]	7	Fruiting	14	root	0.6 0.62	0.61	2007/1068765 MI 123
USA, 2004 (WI) (American Ginseng)	WP 50%	0.225 [a]	7	Red berries	13	root	0.43 0.41	0.42	2007/1068765 WI 25
USA, 2004 (WI) (American Ginseng)	WP 50%	0.225 [a]	7	Berries dropping	14	root	0.28 0.27	0.28	2007/1068765 WI 29
USA, 2004 (WI) (American Ginseng)	WP 50%	0.225 [a]	7	Berries dropping	15	root	0.28 0.29	0.28	2007/1068765 WI 30

[a] Drip irrigation

Stalk and stem vegetable

Globe artichoke

Ten outdoor trials on globe artichoke from Germany, northern and southern France, the Netherlands, Spain and Italy conducted during the growing season 2006 and 2007. Dimethomorph was applied three times by foliar broadcast spray in intervals of 7 ± 1 day. The timing of the applications was from 17 until 3 ± days before harvest.

Samples (artichoke heads) were analysed by HPLC-MS/MS using method 575/0. The limit of quantification of this method was 0.01 mg/kg and the recovery was 70–110% at fortification levels of 0.01 and 1.0 mg/kg. The results are summarized in Table 32.

Table 32 Residues in Artichoke from foliar application of dimethomorph in outdoor trials from Europe

ARTICHOKE (VS 0620) Country, year (variety)	Form	Application			PHI (days)	Commodity	Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment				
Critical GAP France, Italy		0.18	3		3			
N France, 2006 (Camus)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.13	2008/1068911 A6025 BM1
					3		0.26	
					8		0.06	
Netherlands, 2006 (Concerto)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.58	2008/1068911 A6025 NL1
					3		0.75	
					7		0.69	
Germany, 2006 (Imperial Star)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.42	2008/1068911 A6025 HA1
					3		0.55	
					8		0.2	
N France, 2007 (Camus)	EC 72 g/L + py	0.18	3	4 days before harvest	0	heads	0.22	2009/1013323 A7037 BM1
					4		0.11	
					7		0.08	
Germany, 2007 (Green Globe)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.36	2009/1013323 A7037 HA1
					3		0.24	
					7		0.09	
Italy, 2006 (Spinosio, DI Albenga)	EC 72 g/L + py	0.18	3	4 days before harvest	0	heads	0.10	2008/1068911 A6025 IT1
					4		0.06	
					7		0.04	
S France, 2006 (Makau)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.32	2008/1068911 A6025 TL 1
					3		0.08	
					8		0.09	
Italy, 2007 (Brindisino)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	1.27	2009/1013323 A7037 IT1
					3		1.14	
					7		0.79	
S France, 2006 (Makau)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.42	2009/1013323 A7037 TL1
					3		0.32	
					7		0.15	
Spain, 2007 (Prat)	EC 72 g/L + py	0.18	3	3 days before harvest	0	heads	0.31	2009/1013323 A7037 ES2
					4		0.14	
					7		0.10	

[a] Spray volumes of 400 L/ha

Celery

Nine outdoor residue decline trials on celery from the USA and Canada performed during growing season 2008. Dimethomorph was applied three times as a foliar broadcast spray with and spray intervals of 4–6 days. The timing of the applications was from vegetative stage (35–40 cm) until stalk elongation.

Duplicate samples were analysed by HPLC-MS/MS using Method 575/0. The limit of quantification was 0.01 mg/kg and the mean recovery 78 ± 8% at fortification levels from 0.01–10.0 mg/kg. The results are summarized in Table 33.

Table 33 Residues in celery from foliar application of dimethomorph in outdoor trials from the USA and Canada

CELERY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg [a] ai/ha	No	Growth stage at last treatment		Leaf stalk		
						individual value	average value	
Critical GAP USA		0.21	3		0			
USA (FL), 2008 (AB52)	SC 225 g/L	0.225	3	vegetative 14–16”	0	1.25 1.28	1.265	2009/7003324 RCN R08240
					1	0.85 1.11	0.98	
					3	0.25 0.27	0.26	
					7	0.24 0.23	0.235	
					10	0.15 0.15	0.15	
USA (FL), 2008 (Utah)	SC 225 g/L	0.225	3	BBCH 49	0	5.8 5.27	5.535	2009/7003324 RCN R08241
					1	5.35 5.19	5.27	
					3	1.02 0.99	1.01	
					7	1.07 1.01	1.04	
					10	0.92 0.89	0.905	
USA (WI), 2008 (Tango)	SC 225 g/L	0.225	3	BBCH 46	0	3.12 2.8	2.96	2009/7003324 RCN R08242
					1	3.34 3.19	3.265	
					3	2.09 1.83	1.96	
					7	0.51 0.58	0.545	
					10	0.34 0.37	0.355	
Canada (QC), 2008 (Victoria)	SC 225 g/L	0.225	3	BBCH 49	0	1.47 1.62	1.545	2009/7003324 RCN R08243
					1	1.03 1.03	1.03	
					3	0.85 0.87	0.86	
					7	0.06 0.06	0.06	
					10	0.06 0.05*	0.055	
Canada (QC), 2008 (XP266)	SC 225 g/L	0.225	3	BBCH 49	0	2.1 1.6	1.85	2009/7003324 RCN R08244
					1	1.26 1.17	1.215	
					3	1.15 1.1	1.125	
					7	0.09 0.08	0.085	
					10	0.07 0.07	0.07	
USA (CA), 2008 (Mission)	SC 225 g/L	0.225	3	BBCH 49	0	7.6 8.82	8.21	2009/7003324 RCN R08245
					1	7.89 7.16	7.525	

CELERY Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)		Reference & Comments
		kg [a] ai/ha	No	Growth stage at last treatment		Leaf stalk		
						individual value	average value	
					3	5.12 5.05	5.085	
					7	4.88 5.37	5.125	
					10	3.32 2.3	2.81	
USA (CA), 2008 (Mission)	SC 225 g/L	0.225	3	BBCH 49	0	3.99 4.05	4.02	2009/7003324 RCN R08246
					1	1.56 1.15	1.355	
					3	1.04 1.17	1.105	
					7	0.61 0.42	0.515	
					10	0.51 0.45	0.48	
USA (CA), 2008 (G15)	SC 225 g/L	0.230	3	BBCH 49	0	1.97 1.84	1.905	2009/7003324 RCN R08247
					1	1.8 1.76	1.78	
					3	1.05 1.22	1.135	
					7	0.16 0.13	0.145	
					10	0.05 0.06	0.055	
USA (CA), 2008 (Sinora)	SC 2025 g/L	0.225	3	Stalk elongation	0	2.39 2.48	2.435	2009/7003324 RCN R08248
					1	1.76 2.03	1.895	
					3	1.45 1.56	1.505	
					7	0.25 0.41	0.33	
					10	0.34 0.52	0.43	

[a] Spray volumes of 277–301 L/ha

Taro corm (root)

Three field trials on taro were conducted in Hawaii during growing season 2000. Meeting. Dimethomorph was applied seven times as a foliar spray or drip irrigation. Dimethomorph was applied with a spray interval of 7 to 8 days to the vegetative stage (growth height 1.2 m to 1.7 m).

The cormes were analysed using GC-ECD and Method FAMS 002-04. The limit of quantification was 0.01 mg/kg and the recovery 76–119% at fortification level 0.01–10 mg/kg for leaves. The results are summarized in Table 34.

Table 34 Residues in outdoor Taro corm from foliar application of dimethomorph in trials from USA

TARO Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment		Corms	
Critical GAP USA, except California		0.19	5		30		
USA (HI) 2000	WP	0.225 [b]	7	vegetative,	28	0.0494	2003/7010215

TARO Country, year (variety)	Form	Application			PHI (days)	Dimethomorph Residues (mg/kg)	Reference & Comments
		kg ai/ha [a]	no	Growth stage at last treatment		Corms	
(Chinese)	500 g			1.83 m		0.0464 mean 0.0479	IR-4 PR 07335 H109
USA (HI) 2000 (Chinese - 'Bun Long')	WP 500 g	0.225	7	vegetative 1.53 m	28	0.343 0.195 mean 0.269	2003/7010215 IR-4 PR 07335 H110
USA (HI) 2000 (Chinese - 'Bun Long')	WP 500 g	0.225	7	vegetative 1.83 m	28	0.0523 0.0477 mean 0.05	2003/7010215 IR-4 PR 07335 H11

[a] Spray volumes of 1400–1900 L/ha
[b] Drip irrigation

Fate of residues in storage and processing

Oranges

During the 2011 growing season four independent field trials were conducted in oranges (sweet) in Spain to determine the potential for concentration of residues in juice, marmalade, pulp, pomace, pulp and oil after processing to these commodities. Treated plots received two foliar applications of dimethomorph (DC formulation) at a rate of 1.22 kg ai/ha 28 and 14 days before harvest. Samples of whole fruits were taken on the day of the last application (BBCH 83–85) and 14 ± 1 day later (BBCH 89).

The processing of oranges was conducted with samples taken at the last sampling using simulated commercial processing procedures according to the flowchart below. During processing, nine different fractions of orange products or intermediates were collected for analysis specifically; juice, wet pomace, dried pomace, marmalade, peel after oil extraction, pulp, peel, dried pulp and oil.

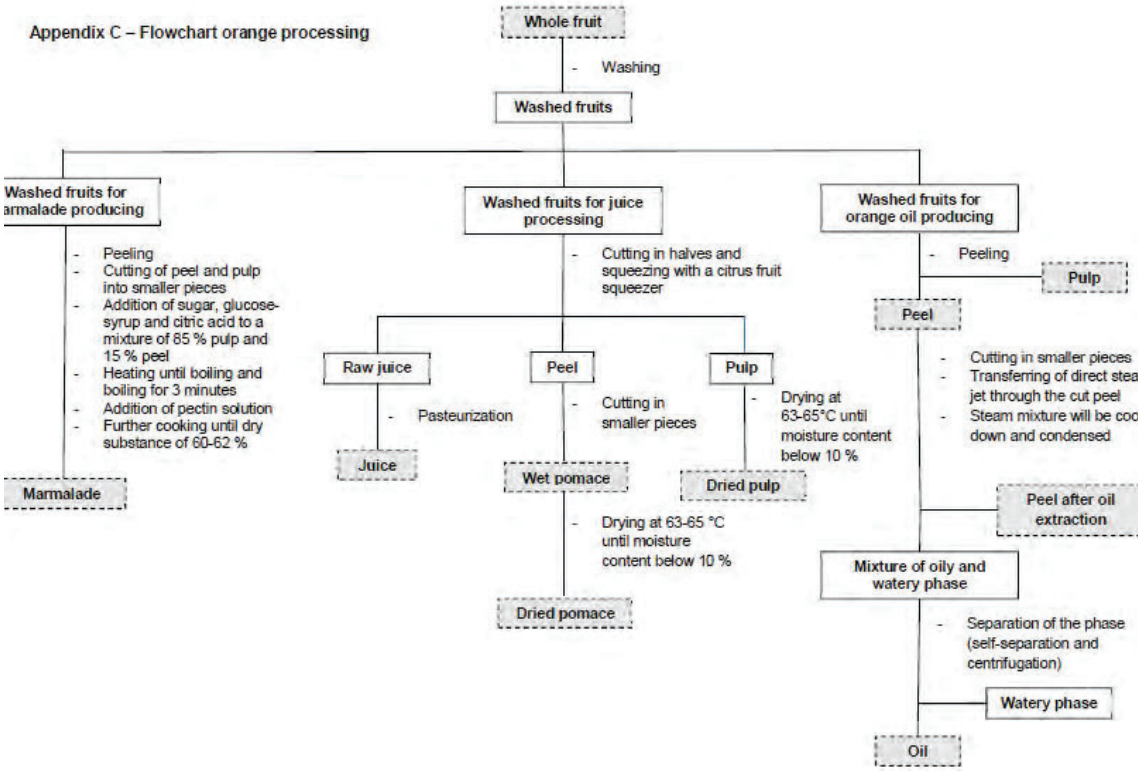

Figure 1 Flow chart of processing procedure for oranges

Table 35 Residues of dimethomorph in processed commodities of oranges

Portion analysed	Dimethomorph residues mg/kg					transfer factor (Tf) [a]				
Trial [b]	Days after last treatment	1	2	3	4	1	2	3	4	mean Tf best estimate
Whole fruit Whole fruit	0 14–15	0.34 0.12	0.31 0.13	0.32 0.058	0.73 0.15	–	–	–	–	–
Peel Pulp	14–15 14–15	0.30 0.022	0.35 0.013	0.23 < 0.010	0.41 0.013	–	–	–	–	–
Whole fruit, RAC [c]		0.079	0.12	0.12	0.25	1	1	1	1	
Juice		< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.13	< 0.08	< 0.08	< 0.04	< 0.08
Wet pomace		0.14	0.12	0.16	0.35	1.77	1.00	1.33	1.40	1.38
Dried pomace		0.39	0.34	1.2	1.2	4.94	2.83	10.00	4.80	5.64
Marmalade		< 0.01 [d]	0.012	< 0.01	< 0.01	< 0.13	0.10	< 0.08	< 0.04	0.09
Peel after oil extraction		0.14	0.19	0.21	0.78	1.77	1.58	1.75	3.12	2.06
Pulp		< 0.010 [d]	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.13	< 0.08	< 0.08	< 0.04	< 0.08
Peel		0.11	0.18	0.18	0.53	1.39	1.50	1.50	2.12	1.62
Dried Pulp		0.026	0.014	0.026	0.048	0.33	0.12	0.22	0.19	0.22
Oil		< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.13	< 0.08	< 0.08	< 0.04	< 0.08

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: L110357, Trial 2: L110358, Trial 3: L110359, Trial 4: L110360. These trials are not reported in details here.
[c] At processing start
[d] For calculation purposes < 0.01 is set 0.01

Strawberry (doc. code 2012/1002401)

During the 2007 growing season four independent field trials in strawberries were conducted in Germany to study the potential of concentration of residues in jam and canned fruit after processing to these commodities. Dimethomorph (WP formulation) was applied once at (0.375 g ai/plant) which are 2–3 times maximum label rate for foliar and soil drench applications respectively. Samples of strawberries were collected 35 days after last application according to critical GAP.

The samples were processed into washed fruit, jam and canned fruit. During processing using simulated commercial processing procedures according to flow diagram in flowchart below different fractions of strawberry intermediates were collected for analysis; specifically washed strawberries, wash water, jam before cooking, jam after cooking, canned strawberries and vegetable stock.

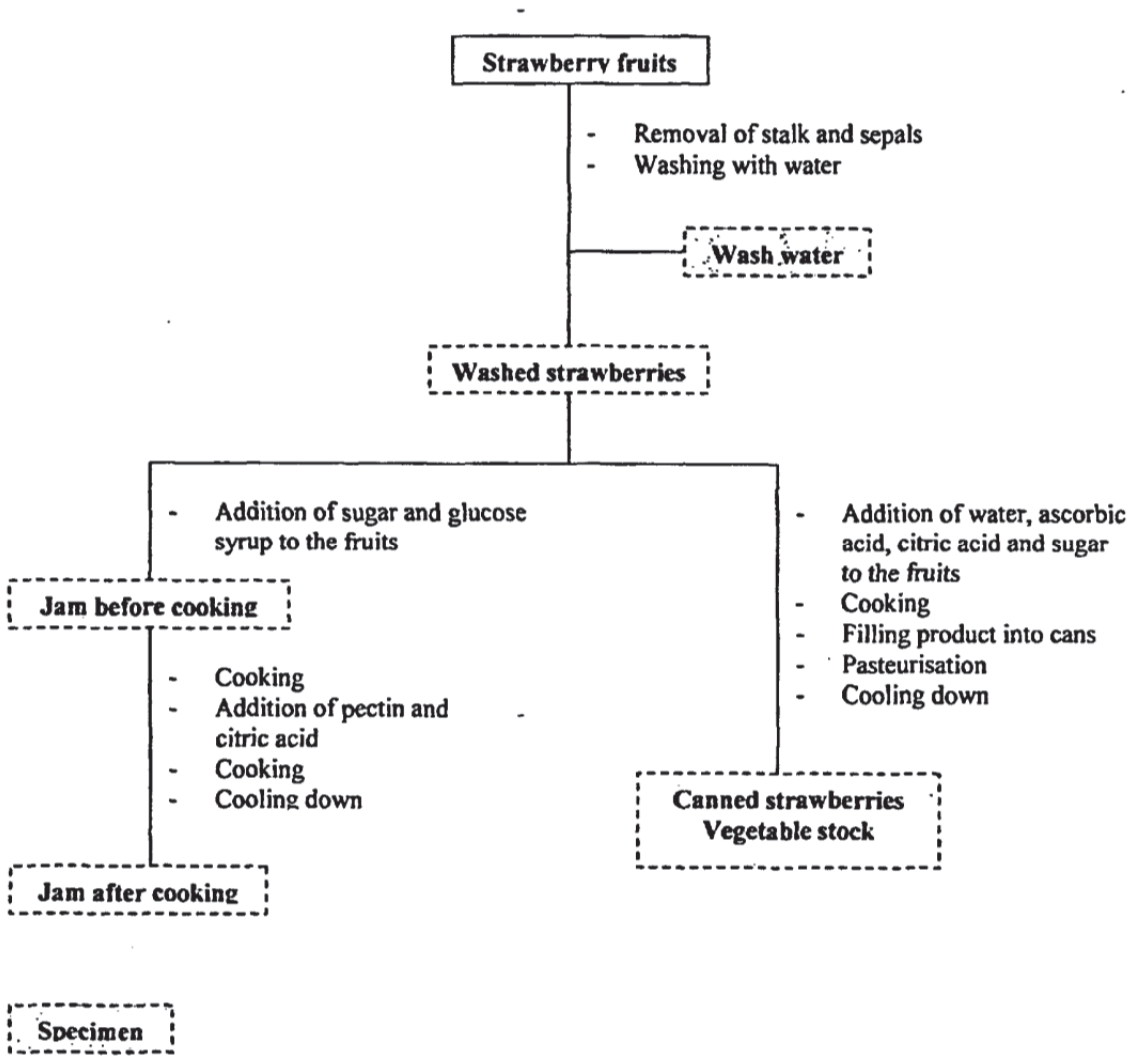

Figure 2 Flow chart of processing procedure for strawberry

Table 36 Summary of dimethomorph residues in process fractions and transfer factors, based on residue levels determined in unwashed strawberry fruit

Portion analysed	DALA	Dimethomorph residues mg/kg				transfer factor (Tf) [a]					
Trial [b]		1	2	3	4	1	2	3	4	median Tf best estimate	mean Tf excl. trials 2 and 4
Strawberry, fruit, RAC [d]	35	0.14	0.092 [c]	0.25	0.091 [c]	1	1	1	1	1	1
washed strawberries		0.11	0.17	0.27	0.2	0.79	1.85	1.08	2.20	1.47	0.94
wash water		0.13	0.07	0.19	0.065	0.93	0.76	0.76	0.71	0.76	0.85
jam before cooking		0.037	0.051	0.19	0.054	0.26	0.55	0.76	0.59	0.57	0.51
jam after cooking		0.034	0.050	0.11	0.039	0.24	0.54	0.44	0.43	0.44	0.34
canned strawberries		0.080	0.14	0.25	0.11	0.57	1.52	1	1.21	1.11	0.79
vegetable stock		0.055	0.080	0.17	0.057	0.38	0.87	0.68	0.63	0.66	0.53

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: FR 24/07/50, Trial 2: FR 24/07/70, Trial 3: 24/07/30, Trial 4: 24/07/75. These trials are not reported in details here
[c] Unusually low values (maybe due to analytical problems)
[d] At processing start

Table 37 Summary of dimethomorph residues in process fractions and transfer factors based on residue levels determined in washed strawberries

Portion analysed	DALA	Dimethomorph residues mg/kg				transfer factor (Tf) [a]				
Trial [b]		1	2	3	4	1	2	3	4	median Tf
washed strawberries	35	0.11	0.17	0.27	0.2	1	1	1	1	1
wash water		0.13	0.07	0.19	0.065	1.18	0.41	0.7	0.32	0.56
jam before cooking		0.037	0.051	0.19	0.054	0.34	0.30	0.7	0.27	0.32
jam after cooking		0.034	0.050	0.11	0.039	0.31	0.29	0.4	0.195	0.3
canned strawberries		0.080	0.14	0.25	0.11	0.73	0.82	0.93	0.55	0.78
vegetable stock		0.055	0.080	0.17	0.057	0.50	0.47	0.63	0.28	0.49

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: FR 24/07/50, Trial 2: FR 24/07/70, Trial 3: 24/07/30, Trial 4: 24/07/75. These trials are not reported in details here

Onion (doc. code 2010/1093126)

During the 2009 growing season four independent trials in bulb onions (*Allium cepa*) were conducted in Germany to study the potential of concentration residues in dried onion, peeled onions and in peel after processing to these commodities. Dimethomorph was applied two times 28 and 14 days before harvest at 0.54 kg ai/ha which is two times the label rate but one time less than maximum number of applications. Samples of onions bulbs were collected on the day of last application and 7±1 days later. The processing of onions was conducted with samples taken at the last sampling which is 7 days later than in cGAP.

Onion bulbs were washed (3 min) with cold tap water immediately before processing. The green leaves were cut off followed by peeling using a knife. The peeled onions were cut into slices and dried in an oven in cycles from 90 ºC 20 minutes, 60 ºC 20 minutes and 50 ºC until the dry weight of 4–6% was reached. After processing four different fractions on onion products or intermediates were collected for analysis, specifically onion bulbs, dried onions, peeled onions and peel.

Residues of dimethomorph were determined by LC-MS/MS using method No. 575/0. The limit of quantitation was 0.01 mg/kg and the mean recovery rate from 84–99% at fortification levels of 0.01–10 mg/kg in the different matrices. The results are summarized in Table 38..

Table 38 Summary of dimethomorph residues and transfer factors in processed commodities from onion bulb

Portion analysed	DALA	Dimethomorph residues mg/kg				transfer factor (Tf) [a]					
Trial [b]		1 [b]	2 [b]	3 [b]	4 [b]	1	2	3	4	Median Tf	mean Tf best estimate
Onion bulb	0	0.45	0.29	0.14	0.38	–	–	–	–		
Onion bulb	7 ± 1	0.22	0.98	0.30	0.098						
Onion bulb (RAC) [c]	7 ± 1	0.66	0.083	0.25	0.029	1	1	1	1	1	1
Dried onions		0.02	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	0.03	0.12	0.04	0.34	0.08	0.13
Peeled onions		< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	0.02	0.12	0.04	0.34	0.08	0.13
Peel		2.8	0.88	1.5	0.35	4.24	10.6	6.0	12.1	8.0	8.2

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: L090306, Trial 2: L090307, Trial 3: L090308, Trial 4: L090309. These trials are not reported in details here
[c] At processing start
[d] For calculation purposes < 0.01 is set 0.01

Lettuce (doc. code 2008/1004853)

During the growing season 2007, four independent field trials were conducted in Northern France, Germany, Spain and Italy to determine the residue levels of dimethomorph in lettuce head (open and closed head cultivars*)* and its processed parts. The trials were treated three times with a dose rate of 0.18 kg ai/ha which generally is according to label rates for outdoor lettuce head and leaf, but below (70%) label rates for protected cultivation of lettuce in the Netherlands.

Samples of lettuce heads were collected 0, 7, 14 and 21 days after the last application for analysis of the raw agricultural commodity. The samples for processing were taken 7 days after last treatment which is 7 days later than in cGAP. The processing procedure included dividing lettuce heads into inner and outer leaves and washing of the leaves.

Residues of dimethomorph were determined by LC-MS/MS using method No. 575/0. The limit of quantitation was 0.01 mg/kg and the mean recovery rate from 71–106% at fortification levels of 0.01–20 mg/kg in the different matrices. The result are summarized in Table 39.

Table 39 Summary of dimethomorph residues in processed commodities of lettuce head and transfer factors

Portion analysed	DALA	Dimethomorph residues mg/kg				transfer factor (Tf) [a]					
Trial [b]		1 [b]	2 [b]	3 [b]	4 [b]	1	2	3	4	median Tf best estimate	Mean Tf
Head, RAC	7	0.28	0.15	1.46	0.59	1	1	1	1	1	1
Inner Leaves		0.071	0.012	0.14	0.14	0.25	0.08	0.10	0.24	0.17	0.17
Inner leaves washed		< 0.01 [c]	< 0.01 [c]	0.21	0.063	0.04	0.07	0.14	0.11	0.09	0.09
Outer leaves		0.27	0.28	3.11	1.03	0.96	1.9	2.13	1.75	1.82	1.69
Outer leaves washed		0.083	0.11	1.45	0.39	0.30	0.73	0.99	0.66	0.7	0.67
wash water (inner leaves		0.016	0.014	0.028	0.025	0.06	0.09	0.02	0.04	0.05	0.05
wash water (outer leaves)		0.21	0.049	0.23	0.23	0.75	0.33	0.16	0.39	0.36	0.41

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: L070028 (open/leafy head), Trial 2: L070029 (closed head), Trial 3: L070034 (open/leafy head), Trial 4: L070035 (open/leafy head. These trials are not reported in details here
[c] For calculation purposes < 0.01 is set 0.01

Pea (doc. code 2007/1044681)

During the 2006 growing season four independent trials were conducted on fresh peas (*Pisum sativum*) in Germany to study the potential of residues its processed products cooked and canned peas. Dimethomorph (WG formulation) was applied as a foliar spray two times 29 and 21 days ± 1 day prior to harvest, at 0.51–0.53 kg ai/ha which is more than two times the label rate. Samples (plants without pods and whole pods) were collected on the day of last application and 21 ± 1 days after last application.

The processing of peas was performed with green seeds taken at the last sampling which is according to cGAP. The green seeds were first washed in tap water for three minutes and then boiled in a saucepan covered with water added with salt 2 g/100 mL until the peas were cooked through. For preserving procedure the peas was blanched by staying 2 minutes < 85 ºC. After blanching the peas were put in tins covered with 2% NaCL-solution. The tins with the peas were sterilized at 120 ºC in an autoclave for 20 minutes. During processing different fractions from pea products or intermediates were collected for analysis, specifically washed peas, cooked peas, blanched seed and canned peas.

Table 40 Summary of dimethomorph residues in processed commodities of peas and transfer factors

Portion analysed	DALA	Dimethomorph residues mg/kg				transfer factor (Tf) [a]				
Trial [b]		1 [b]	2 [b]	3 [b]	4 [b]	1	2	3	4	median Tf
Plants without pods	0	29.067	29.638	20.719	27.746	–	–	–	–	–
Whole pods	0	1.304	2.147	1.521	1.648	–	–	–	–	–
Green seed (RAC) [c]	20–22	0.168	0.042	0.050	0.122	1	1	1	1	1
Washed peas		0.035	0.017	0.046	0.063	0.208	0.405	0.092	0.516	0.307
Wash water		0.111	0.021	0.017	0.048	0.661	0.500	0.340	0.393	0.447 Mean 0.47
Cooked peas		0.014	< 0.01 [d]	0.013	0.021	0.083	0.238	0.260	0.172	0.205
Cooking liquid		0.016	< 0.0 [d]1	0.012	0.020	0.095	0.238	0.240	0.164	0.201
Blanched seed		< 0.01	0.011	< 0.01 [d]	0.021	0.060	0.262	0.200	0.172	0.186
Blanching water		0.021	< 0.01 [d]	< 0.01 [d]	0.026	0.125	0.238	0.200	0.213	0.207
Canned peas		< 0.01	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	0.06	0.238	0.200	0.082	0.141/mean 0.145
Vegetable stock		< 0.01	< 0.01 [d]	< 0.01 [d]	< 0.01 [d]	0.06	0.238	0.200	0.082	0.141

[a] Transfer factor = residue in processed fraction (PF)/ residue in RAC
[b] Trial 1: FR 22/06/40, Trial 2: FR 22/06/70, Trial 3: FR 22/06/50, Trial 4 FR 22/06/60. These trials are not reported in details here
[c] At processing start
[d] For calculation purposes < 0.01 is set 0.01

Table 41 Calculated processing factors from studies provided for dimethomorph residues in oranges, strawberry, onions, lettuce head and pea.

Processed com	pf	n [a]	STMR-P	HR-P
Orange, juice	0.08	4	0.015	0.072
Oranges, peeled	0.08	4	0.015	0.072
Oranges, marmalade	0.09	4	0.017	0.081
Oranges, oil	0.08	4	0.015	0.072
Orange, peel	1.62		0.308	1.458
Orange peel after oil extraction	2.06	4	0.391	1.854
Oranges, dried pulp	0.22	4	0.042	0.198

Processed com	pf	n [a]	STMR-P	HR-P
Orange pomace, wet	1.38	4	0.262	1.242
Orange pomace, dry	5.64	4	1.072	5.076
Grapes, wine	0.29 [b]	4	0.189	0.87
Raisin	1.8 [b]	4	1.17	5.4
Grape, pomace wet	2.75 [b]	4	1.787	8.25
Strawberry, washed	1.47	4	0.191	1.323
Strawberry, jam before cooking	0.57	4	0.074	0.513
Strawberry, jam after cooking	0.44	4	0.057	0.396
Strawberry, canned	1.11	4	0.632	0.999
Onions, dried	0.13	4	0.009	0.666
Onions, peeled	0.13	4	0.009	0.666
Peel of onions	8.2	4	0.574	4.92
Lettuce head (outdoor), inner leaves	0.17	4	0.165	1.53
Lettuce head (outdoor), inner leaves washed	0.09	4	0.087	0.81
Lettuce head (outdoor), outer leaves washed	0.7	4	0.679	6.3
Peas (*Pisum sativum*) , washed	0.31	4	0.031	0.047

[a] Number

Residues in animal commodities

New residue data on residues of dimethomorph in animal feed have been provided to the 2014 Meeting. A new livestock dietary burden calculation has therefore been performed (Annex 6 to the 2014 Report).

The new estimation did not result in significant change of the dietary burdens of farm animals, please see Appraisal.

APPRAISAL

Dimethomorph is a fungicide with protective action against plant pathogenic *Phytophthora* species and a number of downy mildew diseases of fruit, vegetables and potatoes. It consists of a mixture of an E and Z isomers in approximately equal proportions. Its mode of action is through disruption of fungal cell wall formation.

Dimethomorph was evaluated for the first time by the JMPR in 2007 and the Meeting established an acceptable daily intake (ADI) of 0–0.2 mg/kg bw and an acute reference dose (ARfD) of 0.6 mg/kg bw. The residue (for compliance with the MRL and for the estimation of dietary intake) for plant and animal commodities was defined as dimethomorph (sum of isomers). Maximum residues levels for 20 commodities were proposed by the JMPR in 2007.

The current Meeting received information on supervised residue trial for dimethomorph in oranges, strawberries, grapes, papaya, bulb onions, leek, spring onions, head cabbage, broccoli, pepper, lettuce leaf, spinach, lettuce head, taro, green peas, vining peas, lima beans, artichoke, and celery. An analytical method for determination of dimethomorph in animal matrices were provided as well as validation data for an analytical method in oranges and processing studies in oranges, strawberry, onion, lettuce head, and peas.

Methods of analysis

The 2007 Meeting evaluated methods of analysis for dimethomorph in different plant and animal matrices with a LOQ of 0.01 mg/kg (LC-MS/MS or GC-NDP), LOQ of 0.02 mg/kg (GC-NDP or GC-MS) based on the multi-residue method DFG-S19.

The current Meeting received information on a new analytical method LO138/01 for dimethomorph in animal matrices. In this method dimethomorph is extracted with methanol/water/hydrochloric acid. The final determination of dimethomorph is performed by HPLC-MS/MS at two transitions. Transition m/z 388 → 301 is the target transition for quantification and transition m/z 388 →165 for confirmatory purposes. The method is suitable for measuring residues of 0.01 mg/kg for dimethomorph in milk, egg, muscle and liver.

Stability of pesticide residues in stored analytical samples

In 2007 the Meeting concluded that dimethomorph is stable (less than 10% loss of residues) under frozen conditions in stored samples in most crops and animal commodities if stored under frozen conditions at 18-24 months and 16 months, respectively.

Results of supervised residue trials on crops

Oranges

Data from supervised trials on oranges from Spain were presented to the Meeting. However, no registered GAP from Spain was available for oranges. As a result no estimation of a maximum residue level was made.

Grapes

Data from supervised trials on grapes from the USA were presented to the Meeting. The registered critical GAP in the USA is four foliar applications of 0.219 kg ai/ha and PHI of 14 days.

In twelve independent residue trials from USA matching the cGAP the residues of dimethomorph in grapes were (n=12): 0.11, 0.26, 0.41, 0.46, 0.49, 0.55, 0.65, 0.71, 0.75, 0.92, 1.77, 1.86 mg/kg.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in grapes of 3 mg/kg, 0.60 mg/kg and 1.9 mg/kg, respectively. The Meeting replaces its previous recommendation of 2 mg/kg for a maximum residue level for grapes.

Strawberry

Data from supervised trials on strawberries were presented to the Meeting.

The critical GAP is from Belgium (protected and outdoor) with three successive root drench applications of 0.05 g ai/plant and a PHI of 35 days. No trials supporting the GAP were provided.

In Ireland the GAP (protected and outdoor) is one root drench application of 0.05 g ai/plant with a PHI of 35 days. A dataset on protected strawberries was submitted consisting of four trials with replicate plots treated either at 0.0625 g ai/plant or 0.125 g ai/plant and with four additional trials solely treated at 0.125 g ai/plant.

In four GAP compliant plots conducted at 0.0625 g ai/plant residues in strawberry fruits were (n=4): 0.03, 0.18, 0.26, 0.3 mg/kg.

In four additional trials solely conducted at 0.125 g ai/plant residues in strawberry fruits were (n=4): 0.04 (2), 0.05 and 0.21 mg/kg.

Since the four trials provided according to GAP are insufficient for an evaluation of residues in strawberries, the Meeting decided to extend the dataset by applying the proportionality approach. In accordance to the general principles outlined in the 2012 JMPR report, all residue values within and above 25% deviation from GAP were scaled to match the application rate of 0.05 g ai/plant. From

replicated plots conducted at different application rates, the higher scaled residue was selected for the assessment. Scaled residues in strawberry fruits were: 0.024, 0.14, 0.21, 0.24 mg/kg (factor 0.8, based on 0.0625 g ai/plant → 0.05 g ai/plant and 0.016, 0.016, 0.02, 0.084 mg/kg (factor 0.4, based on 0.125 g ai/plant →0.05 g ai/plant.

The combined scaled dataset is (n=8) 0.016, 0.016, 0.02, 0.024, 0.084, 0.14, 0.21 and 0.24 mg/kg.

Three similar outdoor trials with a PHI of 43 days from Belgium, the Netherlands and Germany were also available. The residues in these trials were for 0.125 g ai/plant (n=3) 0.01, 0.02 and 0.04 mg/kg.

For drip irrigation eight trials from Spain using 2 × 0.75 kg ai/ha with a PHI of one day were presented to the Meeting. No registered GAP from Spain was available for strawberries.

In the United Kingdom the registered GAP for outdoor is one foliar spray at 1.5 kg ai/ha applied just after planting/transplanting with a PHI of 35 days. Eight trials presented to JMPR 2007 from the Netherlands and four trials from northern Europe presented to the current Meeting match this GAP and could be combined. The residues found in these combined trials are (n=12) < 0.01mg/kg (9), 0.01, 0.02 and 0.03 mg/kg.

The highest residues came from the protected root drench treatment. Based on the combined scaled dataset from protected root drench trials for strawberries in Ireland, the Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph for strawberries of 0.5 mg/kg, 0.05 mg/kg and 0.24 mg/kg, respectively. The Meeting replaces its previous recommendation of 0.05 mg/kg for maximum residue level for strawberry.

Papaya

Data from supervised trials on papaya from Brazil were presented to the Meeting. No registered GAP from Brazil was available for papaya. As a result no maximum residue level estimation was made.

Bulb vegetables

Bulb onion

The Meeting received results from supervised trials with dimethomorph on bulb onions. The critical GAP is for Bulb Vegetables (Garlic, Garlic great headed, Leek, Onion dry bulb, Onion green, Onion Welsh Shallot) in the USA and Canada with three foliar applications of 0.21 kg ai/ha and PHI of 0 days.

Ten independent residue trials from the USA (nine) and Canada (one) were presented on bulb onions matching the cGAP. Residues of dimethomorph in bulb onions were (n=10) 0.06, 0.08, 0.10, 0.12, 0.16, 0.18 (2), 0.23, 0.28 and 0.38 mg/kg. The highest residue of 0.40 mg/kg was measured in individual onion samples.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in bulb onions of 0.6 mg/kg, 0.17 mg/kg and 0.40 mg/kg, respectively. The Meeting also agreed to extrapolate these estimations to shallot and garlic.

Leek

Data from supervised trials on leek were presented to the Meeting. The critical GAP is in France with two foliar applications of 0.18 kg ai/ha and a PHI of 14 days.

Eighteen independent trials from Belgium, Germany, Greece, Italy, France, the Netherlands, Spain, and the UK matching this GAP were presented. The dimethomorph residue from trials on leek was in south EU (n=4) 0.06, 0.08, 0.3 and 0.69 mg/kg and north EU (n=14) 0.01 (2), < 0.02 (2), 0.03, 0.04 (2), 0.07, 0.08 (2), 0.10 (2), 0.11, 0.13.

The combined data set is (n= 18) 0.01 < 0.02 (2), 0.03 0.04 (2), 0.05, 0.06, 0.07, 0.08 (3), 0.10 (2), 0.11, 0.13, 0.30 and 0.69 mg/kg.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in leek of 0.8 mg/kg, 0.08 mg/kg and 0.69 mg/kg, respectively.

Spring onion

Data from supervised trials on spring onion were presented to the Meeting. The critical GAP is for Bulb Vegetables (Garlic, Garlic great headed, Leek, Onion dry bulb, Onion green, Onion Welsh Shallot) in USA and Canada with three foliar applications of 0.21 kg ai/ha and a PHI of 0 days.

Six independent residue trials from the USA matched the cGAP. Residue of dimethomorph in whole plant were (n=6) 1.27, 1.56, 1.79, 2.35, 2.45 and 5.36 mg/kg. The highest residue of 6.6 mg/kg was measured in individual spring onion samples.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in spring onion of 9 mg/kg, 2.1 mg/kg and 6.6 mg/kg, respectively. The Meeting also agreed to extrapolate this estimation to Onion, Welsh.

Brassica vegetables

Head cabbage

The Meeting received results from supervised trials with dimethomorph on head cabbage. The critical GAP is in USA with three foliar applications of 0.21 kg ai/ha and a PHI of 0 days.

Ten independent residue trials from USA matched the cGAP. Residue from dimethomorph in cabbage heads were (n=10) 0.17, 0.45, 0.46, 0.86, 1.08 (2), 1.22, 1.37 1.51 and 4.26 mg/kg. The highest residue of 4.6 mg/kg was measured in individual head cabbage samples.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in head cabbage of 6 mg/kg, 1.1 mg/kg and 4.6 mg/kg, respectively. The Meeting replaces its previous recommendation of 2 mg/kg for maximum residue level for head cabbage.

Broccoli

Data from supervised trials on broccoli were presented to the Meeting. The critical GAP is from the USA which consists of three foliar applications of 0.21 kg ai/ha and a PHI of 0 days.

Ten independent residue trials performed in USA match the US GAP. Residues for dimethomorph in broccoli were (n=10): 0.25, 0.68, 0.74, 0.90, 0.95, 1.49, 1.62, 1.75, 1.88 and 2.33 mg/kg. The highest residue of 2.6 mg/kg was measured in an individual broccoli sample.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in broccoli of 4 mg/kg, 1.3 mg/kg and 2.6 mg/kg, respectively. The Meeting replaces its previous recommendation of 1 mg/kg for a maximum residue level for broccoli.

Fruiting vegetables, other than cucurbits

Peppers

Data from supervised trials on pepper were presented to the Meeting. The GAP in Canada for Fruiting vegetables (tomato, eggplant, ground cherry, peppers (all varieties), pepino and tomatillo) is five foliar applications of 0.225 kg ai/ha and a PHI of 0 days.

In eleven outdoor independent residue trials in USA matching the Canadian GAP the residues of dimethomorph in peppers were (n= 11): 0.04, 0.06, 0.08, 0.11, 0.13(2), 0.14, 0.25, 0.7, 0.84 and 1.05 mg/kg.

Tomato

Data from supervised trials on tomato were presented to the 2007 Meeting. The critical GAP is from Canada for Fruiting vegetable with five foliar applications of 0.225 kg ai/ha and PHI of 0 day.

In twelve outdoor independent residue **t**rials on tomato from the USA matching the cGAP the residue of dimethomorph in tomato fruit were (n= 12): 0.05(2), 0.06(2), 0.07, 0.11, 0.14, 0.21, 0.3, and 0.38, 0.41 and 0.51 mg/kg.

The Meeting noted that the GAP in Canada was for fruiting vegetables, other than cucurbits, the medians of the data sets for peppers and tomatoes differed by less than 5-fold and that the residue populations were statistically similar. The Meeting therefore decided to consider recommending a crop group maximum residue level. The combined data set matching the Canadian GAP is (n= 23) 0.04, 0.05(2) 0.06(3), 0.07, 0.08, 0.11(2), 0.13(2), 0.14(2), 0.21, 0.25, 0.30, 0.38, 0.41, 0.51 0.70, 0.84 and 1.05 mg/kg. The highest residue of 1.2 mg/kg was measured in an individual pepper sample.

The Meeting estimated a group maximum residue level, an STMR value and an HR value for dimethomorph in fruiting vegetables, other than cucurbits except mushrooms and sweet corn of 1.5 mg/kg, 0.13 mg/kg and 1.2 mg/kg, respectively.

The Meeting withdraws its previous recommendation of 1 mg/kg for fruiting vegetable, other than cucurbits except mushrooms and sweet corn.

Leafy vegetables

Lettuce, Head

Data from supervised field trials on head lettuce were presented to the Meeting. The critical GAP is from USA for Leafy vegetables, except brassica vegetables, consisting of three foliar applications at 0.19 kg/ha and a PHI of 0 days.

In fourteen independent trials from the USA matching the cGAP the residues from dimethomorph in head lettuce were (n= 14): 1.08, 1.21, 1.36, 1.42, 1.46, 1.68, 1.72, 2.06, 2.3, 2.82, 3.63, 4.1, 4.37 and 6.45 mg/kg.

The Meeting noted that the US trials reported by the 2007 JMPR resulted in higher residues. The Meeting therefore, confirmed the previous recommendations made by the 2007 JMPR.

Lettuce, Leaf

Data from supervised trials on leaf lettuce were presented to the Meeting. The critical GAP is from USA for Leafy vegetables, except brassica vegetables with three foliar applications 0.19 kg/ha and a PHI of 0 days.

In nine independent trials from the USA matching the cGAP the residues from dimethomorph in lettuce leaf were (n= 9) 2.09, 3.37, 3.68, 4.61, 5.19, 5.38, 5.83, 9.77 and 9.88 mg/kg. The highest residue of 10.5 mg/kg was measured in an individual lettuce sample.

The Meeting estimated a maximum residue level, an STMR value and a HR value for dimethomorph in leaf lettuce of 20 mg/kg, 5.2 mg/kg and 10.5 mg/kg.

Short-term intake assessment showed that residues in leaf lettuce exceeded the acute reference dose of 0.6 mg/kg bw by 110% for children.

Spinach

Data from supervised trials on spinach were presented to the Meeting. The critical GAP is from USA for Leafy vegetables, except brassica vegetables with three foliar applications 0.19 kg/ha and a PHI of 0 days.

In eight independent trials from the USA matching the cGAP the residues from dimethomorph in spinach leaves were (n= 8) 4.69, 5.30, 5.91, 8.21, 8.35, 8.48, 10.18 and 11.26 mg/kg. The highest residue of 11.5 mg/kg was measured in individual spinach samples.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in spinach of 30 mg/kg, 8.3 mg/kg and 11.5 mg/kg, respectively.

Taro leaves

Data from supervised trials on taro leaves from USA were presented to the Meeting. The critical GAP is five foliar applications of 0.19 kg ai/ha and PHI 7 days for use in USA except California.

Dimethomorph was applied seven times to taro at the rate of 0.225 kg ai/ha with an interval of 7–8 days. Presented residue trials from head lettuce, leaf lettuce and spinach show that residues of dimethomorph decline significantly three days after application. The Meeting, therefore, concluded that the first two applications would not contribute significantly to the residues in leaves at harvest.

In three independent trials from USA matching the cGAP residues in taro leaves were (n=3): 1.44, 1.64 and 4.53 mg/kg. The highest residue of 5.4 mg/kg was measured in an individual taro sample.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in taro leaves of 10 mg/kg, 1.64 mg/kg and 5.4 mg/kg, respectively.

Legume vegetable

Peas, shelled (succulent seed)

Data on supervised trials on peas were presented to the Meeting. The critical GAP is from France with two foliar applications at 0.18 kg ai/ha and a PHI of 21 days.

In twelve independent trials from north (eight) and south (four) Europe matching the cGAP residues of dimethomorph in fresh peas without pods were (n= 12) < 0.01 (8), 0.016, 0.044 and 0.063 mg/kg.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in peas without pods of 0.15 mg/kg, of 0.01 mg/kg and 0.063 mg/kg, respectively.

Lima bean

Data from supervised trials on Lima bean were presented to the Meeting. The critical GAP is from the USA with five applications at 0.19 kg ai/ha and a PHI of 0 days.

Ten independent trials matching the cGAP were conducted on Lima bean in USA. Residues of dimethomorph in beans (succulent seed without pods) (n=10) were 0.01, 0.03(4), 0.05, 0.06, 0.08, 0.1, 0.21 and 0.47 mg/kg. The highest residue of 0.48 mg/kg was measured in an individual Lima bean sample.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in Lima bean of 0.7 mg/kg, 0.055 mg/kg and 0.48 mg/kg, respectively.

Root and tuber vegetables

Ginseng

Data from supervised trials on ginseng were presented to the Meeting. The critical GAP from the USA, except California, is five applications of 0.19 kg ai/ha and a PHI of 14 days. Four trials were presented where dimethomorph was applied seven times at 0.225 kg ai/ha. Residue decline trials were not provided for any root and tuber vegetable to support that the first two applications did not contribute to the residues at harvest. Consequently, no maximum residue level estimation was made.

Taro root

Data on supervised trials on taro corms from Hawaii were presented to the Meeting. The critical GAP is five applications of 0.19 kg ai/ha and a PHI of 30 days in the USA, except California. Three trials were presented where dimethomorph was applied seven times at 0.225 kg ai/ha. Residue decline trials were not presented for any root and tuber vegetable to support that the first two applications not contribute to the residues at harvest. Consequently, no maximum residue level estimation was made.

Stalk and stem vegetables

Globe artichoke

Data from supervised trials on globe artichoke were presented to the Meeting. The critical GAP from France is three foliar applications of 0.18 kg ai/ha and PHI of 3 days.

In ten independent trials from Europe matching the French GAP residues of dimethomorph in artichoke heads were in North Europe (n=5) 0.11, 0.24, 0.26, 0.55 and 0.75 mg/kg and in South EU (n=5) 0.06, 0.09, 0.14, 0.32 and 1.14 mg/kg.

The combined data set was (n=10): 0.06, 0.09, 0.11, 0.14, 0.24, 0.26, 0.32, 0.55, 0.75 and 1.14 mg/kg.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in globe artichoke of 2 mg/kg, 0.25 mg/kg and 1.14 mg/kg, respectively.

Celery

Data from supervised trials on celery were presented to the Meeting. The critical GAP is from the USA with three foliar applications of 0.21 g ai/ha and a PHI of 0 days.

In nine independent trials from Canada (two) and from USA (seven) matching the cGAP residues of dimethomorph in leaf stalks were (n=9): 1.27, 1.55, 1.85, 1.91, 2.44, 3.27, 4.02, 5.54 and 8.21 mg/kg.

The highest residue of 8.8 mg/kg was measured from an individual celery sample.

The Meeting estimated a maximum residue level, an STMR value and an HR value for dimethomorph in celery of 15 mg/kg, 2.44 mg/kg and 8.8 mg/kg, respectively.

Animal feeds

Pea forage

Data on supervised trials on peas were presented to the Meeting. The critical GAP is from France with two foliar applications at 0.18 kg ai/ha and a PHI of 21 days. However, the residues (10) 28 days after the second treatment were found to be higher and were used for animal burden calculation: 0.42, 0.59, 1.57, 1.59, 1.88, 2.40, 4.60, 4.97, 5.45 and 9.58 mg/kg.

The Meeting estimated in pea forage a median residue of 2.14 mg/kg (fresh weight) and a highest residue of 9.58 mg/kg (fresh weight).

Fate of residue during processing

The Meeting received information on processing of oranges, strawberries, onions, lettuce head and peas.

Processing factors calculated for the processed commodities for the above raw agricultural commodities, including previously estimated, are shown in the table below. STMP-Ps was calculated for processed commodities of strawberry, onion and peas for which maximum residue levels were estimated.

Processed commodity	Processing factor	PF (Best estimate)	STMR-P	HR-P
Strawberry, jam	0.24, 0.43, 0.44, 0.54	0.435	0.02	
Strawberry, canned	0.57, 1, 1.21, 1.52	1.11	0.0555	
Onions, raw without skin	0.02, 0.04, 0.12, 0.34	0.08	0.014	0.032
Dried onion	0.03, 0.12, 0.04, 0.34	0.13	0.022	0.053
Peas (cooked)	0.08, 0.17, 0.24, 0.26	0.21	0.002	
Peas (canned)	0.06, 0.08, 0.20, 0.24	0.14	0.0014	

*estimated by 2007JMPR Meeting
** PF =processing factor
[b] Data from a 5-week special neurotoxicity study, using a limited number of dogs.

The Meeting confirmed its previous maximum residue level estimation of 5 mg/kg for dried grapes.

Residues in animal commodities

Farm animal dietary burden

Dietary burden calculation for beef cattle, dairy cattle, broilers and laying poultry based on feed items evaluated by JMPR in 2007 and 2014 are provided in table below. The calculations were made according to the livestock diets from US-Canada, EU, Australia and Japan according to OECD feeding table. Noting that fresh forage commodities are not significant in international trade, the Meeting only included the burden contributions from the pea forages in the European dietary burden calculation, as dimethomorph is not authorised for use on peas in US-Canada, Australia or Japan.

Dietary burden calculations for beef cattle, dairy cattle, broilers and laying poultry are presented in Annex 6 and are summarised below.

Estimated maximum and mean dietary burden of farm animals Summary (ppm of dry matter diet)

	US-Canada		EU		Australia		Japan	
	max	mean	max	mean	max	mean	max	mean
Beef cattle	0.4	0.3	14.2 [a]	3.6 [c]	2.6	2.6	0.007	0.007
Dairy cow	0.1	0.1	14.1 [b]	3.5 [d]	2.6	2.6	0.01	0.01
Poultry-broiler	0.002	0.002	0.06	0.05	0.04	0.04	0.002	0.002
Poultry layer	0.002	0.002	5.4 [e g]	1.27 [f h]	0.04	0.04	0.007	0.007

[a] Highest maximum beef or dairy cattle dietary burden suitable for MRL estimates for mammalian tissues
[b] Highest maximum dairy cattle dietary burden suitable for MRL estimates for mammalian milk
[c] Highest mean beef or dairy cattle dietary burden suitable for STMR estimates for mammalian tissues.
[d] Highest mean dairy cattle dietary burden suitable for STMR estimates for milk.
[e] Highest maximum poultry dietary burden suitable for MRL estimates for poultry tissues.
[f] Highest mean poultry dietary burden suitable for STMR estimates for poultry tissues.
[g] Highest maximum poultry dietary burden suitable for MRL estimates for poultry eggs.
[h] Highest mean poultry dietary burden suitable for STMR estimates for poultry eggs

For beef and dairy cattle, the calculated maximum dietary burdens suitable for estimating maximum residue levels in mammalian tissues and milk are 14.2 and 14.1 ppm dry weight of feed respectively.

The calculated mean dietary burden, suitable for estimating STMRs in mammalian tissues and in milk is 3.6 and 3.5 ppm, dry weight of feed, respectively.

In the cattle feeding study evaluated by JMPR in 2007 where lactating cows were dosed at 37.5 ppm (approximately 40% higher than estimated maximum burden) no residues of parent dimethomorph were detected in edible tissue or milk. Therefore the Meeting concluded that no residues are to be expected at the maximum calculated dietary burden for ruminants.

The calculated maximum dietary burden suitable for estimating maximum residue levels in poultry tissues and eggs is 5.4 ppm dry weight of feed and the calculated mean dietary burden, suitable for estimating STMRs in poultry tissues and in eggs is 1 ppm dry weight of feed.

In the metabolism study where laying hens were fed the equivalent of 40 ppm in the feed for seven days, dimethomorph residues in fat and skin were < 0.02 mg/kg and were not detected in tissue or eggs. On the basis that the maximum calculated dietary burden is eight times lower than the dose rate in the metabolism study the Meeting concluded that no residues of dimethomorph are to be expected at the maximum calculated dietary burden for poultry.

The Meeting confirmed the previous recommendations for animal commodities.

RECOMMENDATIONS

On the basis of the data from supervised residue trials the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for the IEDI and IESTI assessment.

Definition of the residue (for compliance with the MRL and for estimation of dietary intake) for plant and animal commodities: dimethomorph (sum of isomers).

The residue is not fat soluble.

MRL recommendations and dietary intake

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
VS 0620	Artichoke, Globe	2		0.25	1.14
VB 0400	Broccoli	4	1	1.3	2.6
VB 0041	Cabbages, Head	6	2	1.1	4.6
VS 0624	Celery	15		2.44	8.8
DF 0269	Dried grapes (= currants, Raisins and Sultanas)	5	5	1.17	3.4
VO 0050	Fruiting vegetables, other than Cucurbits	1.5	1	0.13	1.2
VA 0381	Garlic	0.6		0.17	0.4
FB 0269	Grapes	3	2	0.60	1.9
VA 0384	Leek	0.8		0.08	0.69
VL 0482	Lettuce, Head	10	10	3.6 [a]	7.2 [a]
VL 0483	Lettuce, Leaf	20		5.19	10.5
VP 0534	Lima bean (young pods and/or immature beans)	0.7		0.055	0.48
VA 0385	Onion, Bulb	0.6		0.17	0.4
VA 0387	Onion, Welsh	9		2.1	6.6
VP 0064	Peas, shelled (succulent seeds)	0.15		0.01	0.63
VA 0388	Shallots	0.6		0.17	0.4
VL 0502	Spinach	30		8.3	11.5
VA 0389	Spring onion	9		2.1	6.6
FB 0275	Strawberry	0.5	0.05	0.02	0.24
VL 0505	Taro leaves	10		1.64	5.4
	Dried onion			0.022	0.053
	Grapes, wine			0.18	

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
	Onions, raw without skin			0.014	0.03
	Peas (canned)			0.0014	
	Peas (cooked)			0.002	
	Strawberry jam			0.02	
	Strawberry, canned			0.056	
JF 0448	Tomato juice			0.065	
VW 0448	Tomato paste			0.31	2.88

[a] recommendations from the 2007 Meeting

Additional values used to calculate the livestock animal dietary burden

CCN	Commodity name	STMR or STMR-P, mg/kg	HR or HR-P, mg/kg
AL 0528	Pea vines (green)	2.14	9.58
	Grape pomace wet	1.95 [a]	
	Potato process, waste	0.12 [a]	
	Potato culls	0.02 [a]	0.05 [a]
	Rape meal	0.04 [a]	

[a] recommendations from the 2007 Meeting

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDI) of dimethomorph, based on the STMRs estimated for 30 commodities, for the 17 cluster diets were in the range of 0–2% of maximum ADI (0.2 mg/kg bw), see Annex 3. The Meeting concluded that the long-term intake of residues of dimethomorph resulting from its uses that have been considered by JMPR is unlikely to present a health concern.

Short-term intake

The WHO Panel of the 2007 JMPR established an Acute Reference Dose (ARFD) of 0.6 mg/kg bw for dimethomorph.

The International Estimated Short Intake (IESTI) for dimethomorph was calculated for new food commodities and their processed fractions for which maximum residue levels were estimated and for which consumption data were available, see Annex 4.

For lettuce leaf, the IESTI represented 110% of the ARfD of 0.6 mg/kg bw. On the basis of the information provided to the JMPR it was not possible to conclude that the estimate of the short-term intake of dimethomorph, from the consumption of lettuce leaf, was less than the ARfD. The Meeting noted than an alternative GAP for lettuce leaf was not available.

For the other commodities the IESTI for dimethomorph calculated on the basis of recommendations made by the JMPR represented 0-90% of the ARfD (0.6 mg/kg bw) for children and 0-30% for the general population.

The Meeting concluded that except for lettuce leaf, the short-term intake of residues of dimethomorph, when used in ways that have been considered by the JMPR is unlikely to present a public concern.

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