

Restricted Entry Intervals – Recommendations on Selected Pesticides

for
WorkSafe

Prepared by

Martin Edwards PhD (London)
Toxicology Consulting Limited
36 Hastings Parade, Devonport
Auckland 0624, New Zealand

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1. Introduction

WorkSafe can set restricted entry intervals (REIs) for a pesticide to protect workers from the toxic effects of the substance, under regulation 13.23 of the Health and Safety at Work (Hazardous Substances) Regulations 2017 (Appendix 5.1).

This review makes draft recommendations for REIs for selected pesticides approved for use in New Zealand under the Hazardous Substances and New Organisms (HSNO) Act.

The review estimated the dermal exposure of workers carrying out tasks after pesticide application, using the EPA approach (Appendix 5.3), and comparing the calculated systemic dose with the appropriate health benchmark set by the EPA, the Acceptable Occupational Exposure Level (AOEL), to determine the Risk Quotient (RQ) when the application was complete, and the interval of time until the risk became acceptable, the REI ($RQ \leq 1$).

The draft recommended REIs were based on workers not wearing gloves after the interval from pesticide application has expired, but other appropriate work clothes equivalent to at least: long trousers, long-sleeved shirts, shoes and socks. The draft recommended REIs considered the calculated systemic dose after dermal exposure, which does not account for additional health risks from substances with skin (HSNO 6.5B or GHS Skin Sens. 1 classification) or respiratory sensitisation (HSNO 6.5A or GHS Resp Sens. 1 classification) and irritation/corrosion hazard profiles.

As a minimum, re-entry should not occur until the spray is completely dry, and in addition for enclosed spaces until ventilation is complete. If re-entry must occur before the spray is completely dry and until ventilation of enclosed spaces is complete, for example to manually ventilate greenhouses, then the recommended Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) for Applicators of that substance and application should be worn.

For substances with skin sensitisation classifications (HSNO 6.5B or GHS Skin Sens. 1), a REI of at least 24 hours is recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes. The molecular initiating event of skin sensitisation, the covalent perturbation of dermal proteins, is considered irreversible (OECD, 2012, p24). Currently there is no international consensus on methods to quantify hazards, exposure or risks to “naïve” or “sensitised” individuals from skin sensitisers (Dotson *et al.*, 2015; RIVM, 2018, p11; Safe Work Australia, 2018, p10; WHO, 2012, p1). Exposures to sensitisers should be minimised to prevent sensitisation of “naïve” or allergic reactions in “sensitised” individuals.

Where the estimated RQ for a substance with a skin sensitisation classification indicates a REI of longer than 24 hours, then the longer REI is applied and recommended.

For substances with respiratory sensitisation classifications (HSNO 6.5A or GHS Resp Sens. 1), the international position on methods to quantify hazards, exposure or risks to “naïve” or “sensitised” individuals from respiratory sensitisers is even less clear than the situation with skin sensitisers (Safe Work Australia, 2018, p10). No REIs have been recommended here solely based on a respiratory sensitisation classification. However, for substances with respiratory sensitisation classifications re-entry should not occur before the spray is completely dry and until ventilation of enclosed spaces is complete unless appropriate RPE and other PPE are used.

In a few instances where the approved substance is a smoke generator for the disinfection of enclosed spaces, such as grain silos or greenhouses, the draft recommended REIs were based on estimations of systemic dose after inhalation exposure.

2. Approved Substances

Consultation

For each Approved Substance, is there better data available to input into the REI modelling?

The REI modelling used by the EPA utilises Transfer Coefficients (unit mass of pesticide residue transferred per hour from treated surfaces to re-entry workers) for a limited number of crop activities. For “off label” uses, the TC for “Default in absence of any data” has been modelled. However, for some Approved Substances another TC may be more appropriate, based on the specific nature of their biological activities, for example those substances designed for use on turf?

Transfer Coefficients: [EPA, 2020, pp57-58]

Crop	Activity	Transfer Coefficient (cm ² /hr)	Source	Transfer Coefficient (cm ² /hr)	Source
		Without gloves		With gloves	
Vegetables	Reach/Pick	2,500	EUROPOEM (2002)	580	EFSA, 2014a
Fruit from trees	Search/Reach/Pick	4,500	EUROPOEM (2002)	2,250	EFSA, 2014a
Berries	Reach/Pick	3,000	EUROPOEM (2002)	750	EFSA, 2014a
Ornamentals	Cut/Sort/Bundle/Carry	5,000	EUROPOEM (2002)	1,400	EFSA, 2014a
Turf	Mowing	1,000	NOHSC	No data	-
Turf	Transplanting, Hand weeding	20,000	NOHSC	No data	-
Pasture	Mowing	500	EFSA (2005)	No data	-

Cereals	Scouting, Irrigation, Weeding mature/full foliage plants	1,000	US EPA (2007)	No data	-
Default in absence of any data		5,200	-		

For those Approved Substances intended for application before the crop has emerged from the soil (pre-emergent uses), it has been assumed that dermal contact with spray residues by re-entry workers would be unlikely, and REIs have not been recommended for these applications. Is this assumption valid?

For those Approved Substances with non-specific herbicidal action, for example for weed control under trees and vines, or pre-plant burn down, it has been assumed that dermal contact with spray residues by re-entry workers would be unlikely, and REIs have not been recommended for these applications. Is this assumption valid?

For those Approved Substances classified as skin sensitisers (HSNO 6.5B, GHS Skin Sens. 1), it has been recommended that a REI of at least 24 hours is established to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes thereafter. Is this recommendation robust to protect “naïve” individuals from sensitisation and “sensitised” individuals from allergic reactions?

For Approved Substances classified as respiratory sensitisers (HSNO 6.5A, GHS Resp Sens. 1), no extra controls than those recommended for skin sensitisers has been proposed. Is this proposal robust to protect “naïve” individuals from sensitisation and “sensitised” individuals from allergic reactions? Should RPE be mandated for re-entry workers?

For those Approved Substances with “indoor” or other enclosed space applications, it has been recommended that any REI starts once ventilation is started to minimise any inhalation exposure and ensure the spray is completely dry on the affected surfaces before re-entry. Is this proposal robust?

2.1. HSR000154: Soluble concentrate containing 195g/litre acephate. Also contains ethylene glycol

2.1.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000154	Soluble concentrate containing 195g/litre acephate. Also contains ethylene glycol	All crops	68 days

Consultation

Given the biological activity of acephate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.1.2. Discussion

As of 6 July 2021, we were unable to match HSR000154 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) acephate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p21).

2.1.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0012	Substance specific
DA = dermal absorption (expressed as a proportion)	0.05	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Acephate:

AOEL = 0.0012 mg/kg bw/d (EPA, 2012a, p135 citing USEPA, 2001).

Dermal Absorption (DA) = 5% [0.05] (EPA, 2012a, p135 citing Anon, 2001).

Foliar DT₅₀ = 7.6 days (EPA, 2012, complied data).

Soil DT₅₀ = 2.3 days (EPA, 2012, p146 citing EFSA, 2006c).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000154 – Additional controls: indicated a maximum application rate of 3500g acephate/ha, 3 times per crop cycle (EPA, 2013, p21).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.1.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000154	Substance Name	Soluble concentrate containing 195g/litre acephate. Also contains ethylene glycol		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		3500 g a.i./ha; 3 appl'n/year	3500 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	469.83	No data	67.5	No data

2.1.5. Notes

2.1.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000154*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/393745E8-AF6E-40A5-9AE7-306BDB72794A>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.1.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.2. HSR000155: Water soluble powder containing 750-970g/kg acephate

2.2.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000155	Water soluble powder containing 750-970g/kg acephate	Ornamentals	17 days
		Tomatoes (outdoor); Boysenberries; Lettuce	24 days
		Cabbage, Cauliflower	30 days
		Citrus; Tamarillos; Avocados	51 days
		All other crops, except: Ornamentals; Tomatoes (outdoor); Boysenberries; Lettuce; Cabbage, Cauliflower; Citrus; Tamarillos; Avocados	68 days

Consultation

Given the biological activity of acephate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.2.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR000225 were: P002041 – Orthene WSG and P006086 – Lancer 750DF.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) acephate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p32), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.2.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000154.

Label rates from P002041 – Orthene WSG.

2.2.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000155	Substance Name	Water soluble powder containing 750-970g/kg acephate		ACVM Register	P002041 – Orthene WSG and P006086 – Lancer 750DF		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Avocados	Grass grub beetles, Greedy scale, Leafroller caterpillars, Mealy bugs	Max. 2.4kg/ha; 3 appl'n per season; 14-21 day intervals	2328g a.i./ha; 3 appl'n; 14-day interval	Fruit from trees – Search/Reach/Pick	203.04	101.52	58.3	50.7
	Aphids	Max. 1.2kg/ha; 3 appl'n per	-					

		season; 14-21 day intervals						
Boysenberries	Leafhoppers	800g/ha	776g a.i./ha; 1 appl'n [Ber 5] ^{a,b}	Berries – Reach/Pick	33.26	8.31	38.4	23.2
Cabbage, Cauliflower	White butterfly, Diamondback moth, Green peach aphid	Max. 1.1kg/ha; 3 appl'n per season; 7-10 day intervals	1067g a.i./ha; 4 appl'n; 7-day interval [Bra 8] ^{a,c}	Vegetables – Reach/Pick	74.47	15.49	47.3	30.0
Citrus	Aphids, Mealybug, Leafroller, Kelly's citrus thrips, Citrus flower moth	Max. 1.6kg/ha; 3 appl'n per season; 28-day intervals	1552g a.i./ha; 3 appl'n; 28-day interval	Fruit from trees – Search/Reach/Pick	108.14	54.07	51.4	43.8
Lettuce	Aphids, Caterpillars	Max. 800g/ha; 2 appl'n per season	776g a.i./ha; 2 appl'n; 7-day interval	Vegetables – Reach/Pick	42.35	8.81	41.1	23.9
Roses and other ornamentals	Aphids, Caterpillars	20-80g/100L; 14-day intervals	80g a.i./ha; 4 appl'n; 3-day	Ornamentals – Cut/Sort/Bundle/Carry	15.88	4.45	30.3	16.4

			interval [Orn 10] a,d					
Tamarillos	Aphids, Caterpillars, Grass grub beetles	Max. 1.6kg/ha; 2 appl'n per season; 10-14 day intervals	1552g a.i./ha; 2 appl'n; 10-day interval	Fruit from trees – Search/Reach/Pick	139.85	69.93	54.2	46.6
Tomatoes (Outdoor only)	Caterpillars	Max. 800g/ha; 2 appl'n per season; 14-day interval	776g a.i./ha; 4 appl'n; 14-day interval [FTo 4] a,c	Vegetables – Reach/Pick	38.20	7.95	39.9	22.7
All crops: maximum stipulated application rate in APP201045		3500 g a.i./ha; 3 appl'n/year	3500 g a.i./ha; 3 appl'n/year; 7- day interval	Default in absence of any data	469.83	No data	67.5	No data
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^d Industry source: Critical (rate<label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p>								

2.2.5. Notes

2.2.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000155*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/16B2EC21-E6EF-4911-B72B-EF139EC80312>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.2.7. Approved Substance ACVM Registered Label

P002041 – Orthene WSG

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55533

P006086 – Lancer 750DF

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=53026

2.3. HSR000156: Emulsifiable concentrate containing 45g/litre acephate and 8.8g/litre myclobutanil

2.3.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000156	Emulsifiable concentrate containing 45g/litre acephate and 8.8g/litre myclobutanil	All crops	68 days
The REI modelling was driven by acephate with the lower AOEL, and higher application rate.			

Consultation

Given the biological activity of acephate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.3.2. Discussion

As of 6 July 2021, we were unable to match HSR000156 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) acephate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p43).

2.3.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000154.

Myclobutanil:

AOEL = 0.03 mg/kg bw/day (EFSA, 2010, p14).

Dermal absorption (DA) = 25% [0.25] (EFSA, 2010, p14).

2.3.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000156	Substance Name	Emulsifiable concentrate containing 45g/litre acephate and 8.8g/litre myclobutanil		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		3500 g acephate/ha; 3 appl'n/year	3500 g acephate/ha; 3 appl'n/year; 7-day interval	Default in absence of any data	469.83	No data	67.5	No data

2.3.5. Notes

2.3.6. Approved Substance Specific References

EFSA, 2010. *Conclusion on the peer review of the pesticide risk assessment of the active substance myclobutanil*. EFSA Journal;8(10):1682.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2010.1682>

EPA HSNO Classifications: HSR000156. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/2C673254-4DD0-4CC2-85FE-B1020D179190>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.3.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.4. HSR000157: Emulsifiable concentrate containing 45g/litre acephate and 39g/litre triforine

2.4.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000157	Emulsifiable concentrate containing 45g/litre acephate and 39g/litre triforine	All crops	68 days
The REI modelling was driven by acephate with the lower AOEL, and higher application rate.			

Consultation

Given the biological activity of acephate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.4.2. Discussion

As of 6 July 2021, we were unable to match HSR000157 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) acephate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p55).

2.4.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000154.

Triforine:

The US EPA assessed that effects from occupational dermal exposure to triforine would not be expected, as no hazard was reported during a 21-day dermal toxicity study conducted at the limit dose (US EPA, 2008, p14&16).

2.4.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000157	Substance Name	Emulsifiable concentrate containing 45g/litre acephate and 39g/litre triforine		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		3500 g a.i./ha; 3 appl'n/year	3500 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	469.83	No data	67.5	No data

2.4.5. Notes

2.4.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000157*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/28A7497E-F446-4CF4-BDD6-33BAC9BA1408>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

US EPA, 2008. *Reregistration Eligibility Decision for Triforine*. EPA 738-R-08-0002. https://archive.epa.gov/pesticides/reregistration/web/pdf/triforine_red.pdf

2.4.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.5. HSR000158: Emulsifiable concentrate containing 22.5g/litre acephate and 19.5g/litre triforine

2.5.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000158	Emulsifiable concentrate containing 22.5g/litre acephate and 19.5g/litre triforine	All crops	68 days
The REI modelling was driven by acephate with the lower AOEL, and higher application rate.			

Consultation

Given the biological activity of acephate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.5.2. Discussion

As of 6 July 2021, we were unable to match HSR000158 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) acephate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p68).

2.5.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000157.

2.5.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000158	Substance Name	Emulsifiable concentrate containing 22.5g/litre acephate and 19.5g/litre triforine		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		3500 g a.i./ha; 3 appl'n/year	3500 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	469.83	No data	67.5	No data

2.5.5. Notes

2.5.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000158*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/4412D168-D909-44F1-BDA5-766B7151614C>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

US EPA, 2008. *Reregistration Eligibility Decision for Triforine*. EPA 738-R-08-0002. https://archive.epa.gov/pesticides/reregistration/web/pdf/triforine_red.pdf

2.5.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.6. HSR000165: Wettable powder containing 500g/kg chlorpyrifos

2.6.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000165	Wettable powder containing 500g/kg chlorpyrifos	All crops	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.6.2. Discussion

As of 6 July 2021, we were unable to match HSR000165 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p168).

2.6.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.12603	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.01	Substance specific
DA = dermal absorption (expressed as a proportion)	0.01	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Chlorpyrifos:

AOEL = 0.01 mg/kg bw/d (EPA, 2012, p135 citing EFSA, 2005a).

Dermal Absorption (DA) = 1% for spray dilution [0.01] (EPA, 2012, p136 citing EFSA, 2005a).

Foliar DT₅₀ = 5.5 days (EPA, 2012, pp118-119). This was the longest Foliar DT₅₀ value from the range of substance specific values used by the EPA, and modelled here to cover the maximum permissible scenario.

Soil DT₅₀ = 74 days (EPA, 2012, p146 citing EFSA, 2006a).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000165 – Additional controls: indicated a maximum application rate of 1500g chlorpyrifos/ha (EPA, 2013, p168).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.6.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000165	Substance Name	Wettable powder containing 500g/kg chlorpyrifos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data

2.6.5. Notes

2.6.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000165*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/C75B31F7-F9DB-460A-9F05-B69904BC6365>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.6.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.7. HSR000170: Granular material containing 50g/kg chlorpyrifos. Also contains xylene

2.7.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000170	Granular material containing 50g/kg chlorpyrifos. Also contains xylene	All crops	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.7.2. Discussion

As of 6 July 2021, we were unable to match HSR000170 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p178).

2.7.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000165.

2.7.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000170	Substance Name	Granular material containing 50g/kg chlorpyrifos. Also contains xylene		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data

2.7.5. Notes

2.7.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000170*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/631D2F5A-3046-4D0F-9E6F-FB03294B3626>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.7.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.8. HSR000171: Emulsifiable concentrate containing 480g/litre chlorpyrifos

2.8.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000171	Emulsifiable concentrate containing 480g/litre chlorpyrifos	All crops	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.8.2. Discussion

As of 6 July 2021, we were unable to match HSR000171 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p193).

2.8.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000165.

2.8.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000171	Substance Name	Emulsifiable concentrate containing 480g/litre chlorpyrifos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data

2.8.5. Notes

2.8.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000171*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B718838A-3D5F-4D3B-BED2-71445A5DF2C5>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.8.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.9. HSR000173: Wettable powder containing 56.25g/kg carbendazim, 93.75g/kg chlorpyrifos and 400g/kg mancozeb

2.9.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000173	Wettable powder containing 56.25g/kg carbendazim, 93.75g/kg chlorpyrifos and 400g/kg mancozeb	All crops	34 days
<p>The REI modelling was driven by mancozeb with the higher application rate.</p> <p>The REI is based on the calculated RQ.</p> <p>HSR000173 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of the actives:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.9.2. Discussion

As of 6 July 2021, we were unable to match HSR000173 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p203).

The REI modelling was driven by mancozeb with a similar AOEL to chlorpyrifos (0.01mg/kg bw/day *cf* mancozeb, 0.011mg/kg bw/day (EFSA, 2020, p9)), but a lower AOEL than carbendazim (0.02mg/kg bw/day (EC, 2021)); with a higher application rate.

2.9.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000165.

Carbendazim:

AOEL = 0.02 mg/kg bw/d (EC, 2021).

Mancozeb:

AOEL = 0.011 mg/kg bw/d, based on a 1-year toxicity study in dogs, with UF = 100 and a 50% absorption factor due to limited oral absorption (EFSA, 2020, p9).

Dermal Absorption (DA) = 1% for active [0.01], based on data with representative formulations of mancozeb (Penncozeb 80 WP, Dithane M-45, Agria Mancozeb 800 WP) (EFSA, 2020, p10).

2.9.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000173	Substance Name	Wettable powder containing 56.25g/kg carbendazim, 93.75g/kg chlorpyrifos and 400g/kg mancozeb		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1500 g chlorpyrifos/ha	1500 g chlorpyrifos /ha	Default in absence of any data	2.67	No data	7.8	No data
		6400 g mancozeb/ha ^a	6400 g mancozeb/ha		10.37	No data	33.7	No data
^a Application of 1500g chlorpyrifos/ha is the equivalent of 16kg formulation/ha or 6400g mancozeb/ha								

2.9.5. Notes

2.9.6. Approved Substance Specific References

EC, 2021. EU Pesticides Database: https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/active-substances/?event=as.details&as_id=506

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance mancozeb*. EFSA Journal 2020;18(12):5755. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.5755>

EPA Approved hazardous substances with controls: *HSR000173*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/25802C81-A30E-4820-A64C-7A96E74B3CC8>

EPA HSNO Classifications: *HSR000173*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/25802C81-A30E-4820-A64C-7A96E74B3CC8>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.9.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.10. HSR000174: Emulsifiable concentrate containing 800g/litre diazinon (Substance A)

2.10.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000174	Emulsifiable concentrate containing 800g/litre diazinon (Substance A)	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.10.2. Discussion

As of 6 July 2021, we were unable to match HSR000174 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p296).

2.10.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0002	Substance specific
DA = dermal absorption (expressed as a proportion)	0.03	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Diazinon:

AOEL = 0.0002 mg/kg bw/d (EPA, 2012, p136 citing EFSA, 2006b).

Dermal Absorption (DA) = 3% for spray dilution [0.03] (EPA, 2012, p136 citing FAO/WHO, 1998).

Foliar DT₅₀ = 7.6 days (EPA, 2012, spreadsheet of compiled data).

Soil DT₅₀ = 23 days (EPA, 2012, p146 citing EFSA, 2006b).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000174 – Additional controls: indicated a maximum application rate of 2400g diazinon/ha; 2 applications/year; with no minimum interval stipulated, so a 7-day interval was modelled (EPA, 2013, p296).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.10.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000174	Substance Name	Emulsifiable concentrate containing 800g/litre diazinon (Substance A)		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.10.5. Notes

2.10.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000174*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/575B86C2-E31F-49E3-AF09-F1A8A551BB56>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.10.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.11. HSR000177: Wettable powder containing 500g/kg diazinon

2.11.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000177	Wettable powder containing 500g/kg diazinon	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.11.2. Discussion

As of 6 July 2021, we were unable to match HSR000177 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p328).

2.11.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.11.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000177	Substance Name	Wettable powder containing 500g/kg diazinon		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.11.5. Notes

2.11.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000177*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5546E6EE-B0B8-4311-AB27-1FA69315ED82>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.11.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.12. HSR000178: Emulsifiable concentrate containing 200g/L diazinon

2.12.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000178	Emulsifiable concentrate containing 200g/L diazinon	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.12.2. Discussion

As of 6 July 2021, we were unable to match HSR000178 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p344).

2.12.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.12.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000178	Substance Name	Emulsifiable concentrate containing 200g/L diazinon		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.12.5. Notes

2.12.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000178*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/91E53689-7D5D-4B27-B908-13F9C1A0DCE0>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.12.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.13. HSR000179: Emulsifiable concentrate containing 500g/L diazinon and 25g/L permethrin

2.13.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000179	Emulsifiable concentrate containing 500g/L diazinon and 25g/L permethrin	All crops	76 days

The REI modelling was driven by diazinon with the lower AOEL.
The REI is based on the calculated RQ.

HSR000179 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1) and respiratory sensitiser (HSNO 6.5A; GHS Resp Sens. 1):
the spray must be completely dry on the affected surfaces before re-entry; and,
waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.13.2. Discussion

As of 6 July 2021, we were unable to match HSR000179 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p359).

The REI modelling was driven by diazinon with a lower AOEL (0.0002mg/kg bw/d (EPA, 2012, p136 citing EFSA, 2006b) *cf* permethrin, 0.05mg/kg bw/day (IPCS, 1987)).

2.13.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.13.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000179	Substance Name	Emulsifiable concentrate containing 500g/L diazinon and 25g/L permethrin		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.13.5. Notes

2.13.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000179*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/57295411-71BF-4E55-8CCB-0290F1C547C2>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.13.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.14. HSR000180: Emulsion (oil in water) containing 500-600g/L diazinon

2.14.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000180	Emulsion (oil in water) containing 500-600g/L diazinon	Cereals; Forage brassicas	40 days
		Pasture	46 days
		Seed crops (grass, clover, vegetables, ryegrass); Strawberries	57 days
		Apples, Pears; Tomatoes (outdoor); Avocados; Mandarins, Oranges	72 days
		All other crops, except: Cereals; Forage brassicas; Pasture; Apples, Pears; Seed crops (grass, clover, vegetables, ryegrass); Strawberries; Tomatoes (outdoor); Avocados;	76 days

		Mandarins, Oranges	

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.14.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR000175 were P009880 – Synergy Diazinon Liquid; P008635 – Zagro Diazinon 600EW; P007254 – Diazol Insecticide; and, P007707 – DEW 600.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p387), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.14.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.14.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000180	Substance Name	Emulsion (oil in water) containing 500-600g/L diazinon		ACVM Register	P009880 – Synergy Diazinon Liquid; P008635 – Zagro Diazinon 600EW; P007254 – Diazol Insecticide; and, P007707 – DEW 600		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears (Non-Bearing Trees only)	Leaf Curling Midge	Ground – 4.8 L/ha; 1 application	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Pasture – Mowing (grass beneath trees)	61.71	NA	45.2	NA

		Foliar – 100 mL/100L	1000g a.i./ha; 2 applications; 7-day interval [Pip13] ^{c,e}	Fruit (from trees) – Search/Reach/Pick	353.65	176.83	64.3	56.7
	Woolly apple aphid; San Jose scale; Mealy bug; Aphids	Foliar – 100 mL/100L	as above					
	Leafroller	Foliar – 100 mL/100L	as above					
Avocados	Leafroller; Mealy bug; Thrips; Scale Insects	Foliar – 100 mL/100L	1440g a.i./ha; 4 applications; 7-day interval [Avo7] ^{c,d}	Fruit (from trees) – Search/Reach/Pick	651.30	325.65	71.0	63.4
Mandarins, Oranges	Aphids; Australian Citrus Whitefly; Mealy Bug; Scale Insects; Thrips	Foliar – 100 mL/100L	1920g a.i./ha; 2 applications; 7-day interval [Cit7] ^{c,e}	Fruit (from trees) – Search/Reach/Pick	679.01	339.51	71.5	63.9

Cereals	Aphids	1.2 L/ha	600g a.i./ha; 1 application [Ara15] ^{c,d}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	30.86	NA	37.6	NA
Forage brassicas	Springtails	550 mL/ha	275g a.i./ha; 1 application [F&F16] ^{c,d}	Vegetables – Reach/Pick	35.36	7.35	39.1	21.9
Pasture	Grass grub	4.8 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Pasture – Mowing	61.71	NA	45.2	NA
	Porina	1.8-2.4 L/ha	1200g a.i./ha; 1 application [Pas14] ^{c,d}	Pasture – Mowing	30.86	NA	37.6	NA
	Armyworm	1.2 L/ha	600g a.i./ha; 4 applications; 7-day interval [Pas15] ^{c,d}	Pasture – Mowing	30.15	NA	37.3	NA
	Lucerne flea	550 mL/ha	280g a.i./ha; 1 application [Pas18] ^{c,d}	Pasture – Mowing	7.20	NA	21.6	NA

Seed crops (grass, clover, vegetables, ryegrass)	Grass grub, carrot rust fly (carrot and parsnip seed crops only)	4.8 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	123.43	NA	52.8	NA
Strawberries (bearing plants)	Aphids	1.5 L/ha	750g a.i./ha; 2 applications; 7- day interval [Str2] ^{c,f}	Berries – Reach/Pick	176.83	44.21	56.7	41.5
Strawberry runner plants (non-bearing)			as above	Default in absence of any data	306.50	NA	62.8	NA
Tomatoes (outdoor)	Aphids, caterpillars, thrips	1.6 L/ha	900g a.i./ha; 4 applications; 7- day interval [FTo7] ^{c,g}	Berries – Reach/Pick	271.37	61.4	67.84	46.2
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7- day interval	Default in absence of any data	980.79	No data	75.5	No data

^a Crop growth stage only stipulated if detailed on the label;

^b P007254: Diazol Insecticide label used as foliar rates are higher (50g a.i./100L vs. 48g a.i./100L) than the other 3 PPPs;

^c Application rate from relevant EPA, 2012. *APP201045: Summary and Analysis Report*;

^d Critical (rate=label) [relevant EPA, 2012. *APP201045: Summary and Analysis Report*];

^e Industry source: Critical (rate=label) [relevant EPA, 2012. *APP201045: Summary and Analysis Report*];

^f Industry source: Critical (off label) [relevant EPA, 2012. *APP201045: Summary and Analysis Report*];

^g Industry source: Critical (rate>label) [relevant EPA, 2012. *APP201045: Summary and Analysis Report*].

2.14.5. Notes

2.14.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000180*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/D76C879E-9858-46A3-8F0F-D2EC38291F9E>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.14.7. Approved Substance ACVM Registered Label

P007254 – Diazol Insecticide

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=47303

P007707 – DEW 600

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=54840

P008635 – Zagro Diazinon 600EW

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=45889

P009880 – Synergy Diazinon Liquid

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55294

2.15. HSR000181: Emulsifiable concentrate containing 800g/L diazinon (Substance B)

2.15.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000181	Emulsifiable concentrate containing 800g/L diazinon (Substance B)	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.15.2. Discussion

As of 6 July 2021, we were unable to match HSR000181 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p401).

2.15.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.15.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000181	Substance Name	Emulsifiable concentrate containing 800g/L diazinon (Substance B)		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.15.5. Notes

2.15.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000181*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/A854A4A3-AC9F-44B4-A78E-B058E40E81BA>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.15.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.16. HSR000182: Emulsifiable concentrate containing 95g/L diazinon

2.16.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000182	Emulsifiable concentrate containing 95g/L diazinon	All crops	76 days

The REI is based on the calculated RQ.

HSR000182 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.16.2. Discussion

As of 6 July 2021, we were unable to match HSR000182 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p415).

2.16.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.16.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000182	Substance Name	Emulsifiable concentrate containing 95g/L diazinon		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.16.5. Notes

2.16.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000182*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/047A7488-AA5B-4627-BF8D-FB04F0486163>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.16.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.17. HSR000183: Emulsifiable concentrate containing 800g/L diazinon (Substance C)

2.17.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000183	Emulsifiable concentrate containing 800g/L diazinon (Substance C)	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.17.2. Discussion

As of 6 July 2021, we were unable to match HSR000183 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p430).

2.17.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.17.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000183	Substance Name	Emulsifiable concentrate containing 800g/L diazinon (Substance C)		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.17.5. Notes

2.17.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000183*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/D04E84FE-A25C-4E29-AEC8-D3E474057949>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.17.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.18. HSR000184: Emulsifiable concentrate containing 600g/L diazinon

2.18.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000184	Emulsifiable concentrate containing 600g/L diazinon	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.18.2. Discussion

As of 6 July 2021, we were unable to match HSR000184 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p444).

2.18.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.18.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR0001834	Substance Name	Emulsifiable concentrate containing 600g/L diazinon		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.18.5. Notes

2.18.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000184*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/3C08C359-FFEE-4941-AB0E-8924CEF111AF>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.18.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.19. HSR000186: Smoke generator containing 225g/kg pirimiphos-methyl

2.19.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000186	Smoke generator containing 225g/kg pirimiphos-methyl	Empty grain stores/silos	4 hours after ventilation started ^a
^a gloves should be worn to recover spent generator(s).			

Consultation

Given the biological activity of pirimiphos-methyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Does the 15-minute duration activity modelled here appropriately assess the risk to re-entry workers?

2.19.2. Discussion

As of 6 July 2021, we were unable to match HSR000187 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) pirimiphos-methyl is included as an insecticide.

[The UK label for Octavius Hunt Ltd. Actellic Smoke Generator No.20 (225g pirimiphos-methyl/kg) stated that the maximum single dose was one 90g generator per 570m³ for use in empty grain stores (Octavius Hunt, 2021)].

2.19.3. Approved Substance Specific Inputs for REI Modelling

[Each 90g generator would contain 20.25g pirimiphos-methyl that would give in a silo of 570m³, a rate of: 35.5mg pirimiphos-methyl/m³.]

Pirimiphos-methyl:

AOEL = 0.02 mg/kg bw/d (EPA, 2012a, p140 citing EFSA, 2011).

Inhalation absorption = 100%.

Initial (t=0) concentration = 35.5mg pirimiphos-methyl/m³.

On the basis of no data, assumed that pirimiphos-methyl did not degrade or settle-out of the enclosed atmosphere, and no leakage occurred from the silo prior to ventilation.

2.19.4. REI Modelling

The modelling is based on the EPA process adopted to assess the post-application inhalation exposure of HSR101001 (APP202303 – Grainguard Supersmoke: 100g pirimiphos-methyl/kg and 50g deltamethrin/kg)

The EPA modelled the scenario where re-entry occurred when the worker entered the treated empty grain store/silo to recover the spent generator(s) prior to filling the facility (EPA, 2014, pp9-11).

The duration of exposure was modelled at 15 minutes and only the inhalation route was estimated, as the use of gloves to pick up the discharged generator(s) was stipulated. Without data, EPA assumed that the substance(s) did not degrade, and there was no leakage from the silo during the 24-hour application period. Without data, the EPA used a ventilation rate of 0.6 air changes per hour (the minimal ventilation rate for a European residential house (citing ConsExpo 4, RIVM, 2006)).

The EPA calculated the substance air concentration at various timepoints using the ConsExpo 4 equation:

$$C_{air} = \text{initial target concentration} \times e^{-qt}$$

Where: C_{air} = concentration at time t (mg/m^3);

Initial target concentration = $35.5 \text{mg pirimiphos-methyl}/\text{m}^3$;

e = constant 2.72;

q = ventilation rate (number of air changes per unit of time) = 0.6;

t = time from application (hour) = 0, 1, 2, 3.

The post-application inhalation exposure is calculated from (US EPA, 2012, eq 7.5):

$$E = \frac{C_0 \times IR}{ACH} \times [1 - e^{(-ACH \times ET)}]$$

Where: E = exposure (mg/day);

C_0 = initial concentration (mg/m^3);

IR = inhalation rate (m^3/hour) = $1 \text{ m}^3/\text{h}$;

ACH = air changes per hour (hour^{-1}) = 0.6; and,

ET = exposure duration (hour/day) = 0.25.

Absorbed inhalation dose normalised to body weight is calculated from (US EPA, 2012, eq 7.6):

$$D = \frac{E \times AF}{BW}$$

Where: D = dose ($\text{mg}/\text{kg bw}/\text{day}$);

E = exposure (mg/day);

AF = absorption factor (inhalation) = 1; and,

BW = body weight (kg) = 70.

$$RQ = \frac{D}{AOEL}$$

Where: RQ = Risk Quotient;

D = dose ($\text{mg}/\text{kg bw}/\text{day}$); and,

AOEL = Acceptable Operator Exposure Level ($\text{mg}/\text{kg bw}/\text{day}$) = $0.02 \text{ mg pirimiphos-methyl}/\text{kg bw}/\text{day}$.

Estimated re-entry exposure to pirimiphos-methyl			
Time after venting (hours)	Estimated air concentration (mg/m^3)	Estimated worker exposure ($\text{mg}/\text{kg bw}/\text{day}$)	Risk Quotient (RQ)
0	35.5	0.118	5.9
1	19.5	0.065	3.2
2	10.7	0.036	1.8

3	5.9	0.02	1.0
4	3.2	0.011	0.5

2.19.5. Notes

[The label for Octavius Hunt Ltd. Actellic Smoke Generator No.20 stipulates that the store should be closed for 24 hours after application; ventilation of at least 30 minutes should occur before working in the store; and, the store should not be re-entered within 4 hours of ignition unless suitable RPE was worn.]

2.19.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000187*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5C6F8D28-7CAF-4509-9191-E8ACFEA089BD>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

Octavius Hunt, 2021. *Actellic Smoke Generator No.20 – Label*. <https://www.pcs.agriculture.gov.ie/media/pesticides/content/products/labels/06236%20-%20Actellic%20Smoke%20Generator%20-%202019%20to%20date.pdf>

2.19.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.20. HSR000187: Emulsifiable concentrate containing 25g/litre permethrin and 475g/litre pirimiphos-methyl

2.20.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000187	Emulsifiable concentrate containing 25g/litre permethrin and 475g/litre pirimiphos-methyl	All crops	36 days
<p>The REI modelling was driven by pirimiphos-methyl with the lower AOEL, and higher application rate.</p> <p>The REI was based on the calculated RQ.</p> <p>HSR000187 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of pirimiphos-methyl and permethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.20.2. Discussion

As of 6 July 2021, we were unable to match HSR000187 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) pirimiphos-methyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p853).

The REI modelling was driven by pirimiphos-methyl with a lower AOEL (0.02mg/kg bw/d (EPA, 2012, p140 citing EFSA, 2011) *cf* permethrin, 0.05mg/kg bw/day (IPCS, 1990)), and higher formulated concentration.

2.20.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.02	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

**Pirimiphos-methyl:**

AOEL = 0.02 mg/kg bw/d (EPA, 2012a, p140 citing EFSA, 2011).

Dermal Absorption (DA) = 10% [0.10] (EPA, 2012a, p140 citing Footprint, 2011).

Foliar DT₅₀ = 7.6 days (EPA, 2012, complied data).

Soil DT₅₀ = 12 days (EPA, 2012, p147 citing USEPA, 2006b).

Permethrin:

AOEL = 0.05 mg/kg bw/day (IPCS, 1990).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000187 – Additional controls: indicated a maximum application rate of 1425g pirimiphos-methyl/ha; 4 times per crop cycle (EPA, 2013, p853).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.20.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000187	Substance Name	Emulsifiable concentrate containing 25g/litre permethrin and 475g/litre pirimiphos-methyl	ACVM Register	None			
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1425g pirimiphos-methyl/ha; 4 appl'n/year	1425g pirimiphos-methyl/ha; 4 appl'n/year; 7-day interval	Default in absence of any data	24.83	No data	35.2	No data

2.20.5. Notes

2.20.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000187*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5C6F8D28-7CAF-4509-9191-E8ACFEA089BD>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

IPCS, 1990. *Environmental health criteria: 94 – Permethrin*. World Health Organization, Geneva. <https://incem.org/documents/ehc/ehc/ehc94.htm>

2.20.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.21. HSR000188: Emulsifiable concentrate containing 400g/litre dimethoate

2.21.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000188	Emulsifiable concentrate containing 400g/litre dimethoate	All crops	49 days

Consultation

Given the biological activity of dimethoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.21.2. Discussion

As of 6 July 2021, we were unable to match HSR000188 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) dimethoate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p492).

2.21.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.001	Substance specific
DA = dermal absorption (expressed as a proportion)	0.02	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Dimethoate:

AOEL = 0.001 mg/kg bw/d (EPA, 2012a, pp136-137 citing EFSA, 2006c).

Dermal Absorption (DA) = 2% for the diluted spray [0.02] (EPA, 2012a, pp136-137 citing EFSA, 2006c).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000188 – Additional controls: indicated a maximum application rate of 400g dimethoate/ha, 3 times per crop cycle (EPA, 2013, p492).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.21.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000188	Substance Name	Emulsifiable concentrate containing 400g/litre dimethoate		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		400 g a.i./ha; 3 appl'n/year; 7-day interval	400 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	28.45	No data	48.3	No data

2.21.5. Notes

2.21.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000188*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/E01842FF-63BB-4BF7-AAA1-2E7E3604C055>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.21.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.22. HSR000190: Emulsifiable concentrate containing 500g/litre maldison

2.22.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000190	Emulsifiable concentrate containing 500g/litre maldison	All crops	46 days

The REIs were based on the calculated RQs.

HSR000190 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of maldison:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.22.2. Discussion

As of 6 July 2021, we were unable to match HSR000190 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) maldison is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p681).

2.22.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.03	Substance specific
DA = dermal absorption (expressed as a proportion)	0.15	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Maldison:

AOEL = 0.03 mg/kg bw/d (EPA, 2012a, p138 citing EFSA, 2010).

Dermal Absorption (DA) = 15% [0.15] (EPA, 2012a, p138 citing Footprint, 2011).

Foliar DT₅₀ = 7.6 days (EPA, 2012, complied data).

Soil DT₅₀ = 0.17 days (EPA, 2012, p146 citing EFSA, 2009).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000190 – Additional controls: indicated a maximum application rate of 4500g maldison/ha, 2 times per crop cycle with a 7-day interval modelled (EPA, 2013, p681).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.22.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000190	Substance Name	Emulsifiable concentrate containing 500g/litre maldison		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		4500 g a.i./ha; 2 appl'n/year; 7-day interval	4500 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	61.30	No data	45.1	No data

2.22.5. Notes

2.22.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000190*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/C7CC0FA3-DD71-4EA9-95BD-B9CA4B9BF3D0>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.22.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.23. HSR000191: Emulsifiable concentrate containing 100g/litre dimethoate

2.23.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000191	Emulsifiable concentrate containing 100g/litre dimethoate	All crops	49 days

Consultation

Given the biological activity of dimethoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.23.2. Discussion

As of 6 July 2021, we were unable to match HSR000191 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) dimethoate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p505).

2.23.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000188.

2.23.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000191	Substance Name	Emulsifiable concentrate containing 100g/litre dimethoate		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		400 g a.i./ha; 3 appl'n/year; 7-day interval	400 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	28.45	No data	48.3	No data

2.23.5. Notes

2.23.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000191*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/303393AC-0F29-442E-B398-9AE18C7584A5>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.23.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.24. HSR000192: Emulsifiable concentrate containing 5g/litre permethrin and 95g/litre pirimiphos-methyl

2.24.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000192	Emulsifiable concentrate containing 5g/litre permethrin and 95g/litre pirimiphos-methyl	All crops	36 days
<p>The REI modelling was driven by pirimiphos-methyl with the lower AOEL, and higher application rate.</p> <p>The REI was based on the calculated RQ.</p> <p>HSR000192 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of pirimiphos-methyl and permethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.24.2. Discussion

As of 6 July 2021, we were unable to match HSR000192 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) pirimiphos-methyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p868).

The REI modelling was driven by pirimiphos-methyl with a lower AOEL (0.02mg/kg bw/d (EPA, 2012, p140 citing EFSA, 2011) *cf* permethrin, 0.05mg/kg bw/day (IPCS, 1990)), and higher formulated concentration.

2.24.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000187.

2.24.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000192	Substance Name	Emulsifiable concentrate containing 5g/litre permethrin and 95g/litre pirimiphos-methyl		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		1425g pirimiphos-methyl/ha; 4 appl'n/year	1425g pirimiphos-methyl/ha; 4 appl'n/year; 7-day interval	Default in absence of any data	24.83	No data	35.2	No data

2.24.5. Notes

2.24.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000192*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B6DA7392-2A21-4FED-B3EC-AD4B1DA2D36C>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

IPCS, 1990. *Environmental health criteria: 94 – Permethrin*. World Health Organization, Geneva. <https://incem.org/documents/ehc/ehc/ehc94.htm>

2.24.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.25. HSR000193: Emulsifiable concentrate containing 500g/litre dimethoate

2.25.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000193	Emulsifiable concentrate containing 500g/litre dimethoate	All crops	49 days

Consultation

Given the biological activity of dimethoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.25.2. Discussion

As of 6 July 2021, we were unable to match HSR000193 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) dimethoate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p521).

2.25.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000188.

2.25.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000193	Substance Name	Emulsifiable concentrate containing 500g/litre dimethoate		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		400 g a.i./ha; 3 appl'n/year; 7-day interval	400 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	28.45	No data	48.3	No data

2.25.5. Notes

2.25.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000193*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/96262442-229D-4615-8FE4-D91C0F822F32>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.25.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.26. HSR000198: Emulsifiable concentrate containing 400g/litre fenamiphos

2.26.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000198	Emulsifiable concentrate containing 400g/litre fenamiphos	All crops	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.26.2. Discussion

As of 6 July 2021, we were unable to match HSR000198 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p570).

2.26.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0008	Substance specific
DA = dermal absorption (expressed as a proportion)	0.50	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Fenamiphos:

AOEL = 0.0008 mg/kg bw/d (EPA, 2012a, pp137 citing EFSA, 2006d).

Dermal Absorption (DA) = 50% for the diluted spray [0.50] (EPA, 2012a, p137 citing EFSA, 2003a).

Foliar DT₅₀ = 7.6 days (EPA, 2012, complied data).

Soil DT₅₀ = 0.85 days (EPA, 2012, p146 citing Footprint database).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000198 – Additional controls: indicated a maximum application rate of 8000g fenamiphos/ha, once per crop cycle (EPA, 2013, p570).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.26.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000198	Substance Name	Emulsifiable concentrate containing 400g/litre fenamiphos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data

2.26.5. Notes

2.26.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000198*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5EFD5D48-4F4F-49DC-9258-F00447F95B3B>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.26.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.27. HSR000200: Emulsifiable concentrate containing 500g/litre prothiofos

2.27.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000200	Emulsifiable concentrate containing 500g/litre prothiofos	Grapes	87 days
		All other crops, except: Grapes	93 days
<p>The REIs were based on the calculated RQs.</p> <p>HSR000200 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of prothiofos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.27.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR000200 was: P002731 – Tokuthion.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) prothiofos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p896).

2.27.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0001	Substance specific
DA = dermal absorption (expressed as a proportion)	0.50	Default
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Prothiofos:

AOEL = 0.0001 mg/kg bw/d (EPA, 2012a, p140 citing APVMA, 2012).

Dermal Absorption (DA) = 50% [0.50] (EPA, 2012a, p140).

Foliar DT₅₀ = 7.6 days (EPA, 2012, compiled data).

Soil DT₅₀ = 60 days (EPA, 2012, p147 citing Tomlin, 1997).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000200 – Additional controls: indicated a maximum application rate of 500g prothiofos/ha once a crop cycle (EPA, 2013, p896).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.27.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000200	Substance Name	Emulsifiable concentrate containing 500g/litre prothiofos		ACVM Register	P002731 – Tokuthion		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Grapes	Mealy bug	100mL/100L during dormancy; 1000L/ha on mature vines	500 g a.i./ha; 1 appl'n/year [Gra 7] ^{a,b}	Berries – Reach/Pick	2571.43	642.86	86.1	70.9
All crops: maximum stipulated		500 g a.i./ha; 1 appl'n/year	500 g a.i./ha; 1 appl'n/year	Default in absence of any data	4457.14	No data	92.1	No data

application rate in APP201045								
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Label: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p>								

2.27.5. Notes

2.27.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000200*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/BEB4355-589A-4DA0-9AD1-6005D398AD20>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.27.7. Approved Substance ACVM Registered Label

P002731 – Tokuthion

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55537

2.28. HSR000203: Soluble concentrate containing 600g/litre methamidophos (Substance B)

2.28.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000203	Soluble concentrate containing 600g/litre methamidophos (Substance B)	All crops	74 days

Consultation

Given the biological activity of methamidophos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.28.2. Discussion

As of 6 July 2021, we were unable to match HSR000203 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) methamidophos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p713).

2.28.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0912	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0001	Substance specific
DA = dermal absorption (expressed as a proportion)	0.05	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Methamidophos:

AOEL = 0.0001 mg/kg bw/d (EPA, 2012a, p138 citing USEPA, 2006b).

Dermal Absorption (DA) = 5% [0.05] (EPA, 2012a, p138 citing EFSA, 2004a).

Foliar DT₅₀ = 7.6 days (EPA, 2012, compiled data).

Soil DT₅₀ = 4.8 days (EPA, 2012, p147 citing CalEPA, 2005).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000203 – Additional controls: indicated a maximum application rate of 900g methamidophos/ha, once per crop cycle (EPA, 2013, p713).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.28.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000203	Substance Name	Soluble concentrate containing 600g/litre methamidophos (Substance B)		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		900 g a.i./ha; 1 appl'n/year	900 g a.i./ha; 1 appl'n/year	Default in absence of any data	802.29	No data	73.3	No data

2.28.5. Notes

2.28.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000203*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/577D23F1-58E6-4803-95C0-F1BC568F8370>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.28.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.29. HSR000211: Emulsifiable concentrate containing 1000g/litre dichlorvos

2.29.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000211	Emulsifiable concentrate containing 1000g/litre dichlorvos	Indoor crops (greenhouse)	24 hours
		Indoor crops (non-greenhouse)	48 hours
		All outdoor crops	48 hours
<p>The REIs were based on the calculated RQs.</p> <p>HSR000211 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of dichlorvos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?
- b) Are the indoor use rates of 1000 and 1250g dichlorvos/ha in greenhouses and non-greenhouses realistic? If not, what use rates would be used?

2.29.2. Discussion

As of 6 July 2021, we were unable to match HSR000211 to any ACVM registered product with an approved label.

In the HSNO reassessment APP202097 – *Decision* (EPA, 2015, p2) dichlorvos is stated to be an insecticide.

In the HSNO reassessment APP202097 – *Controls Annex* restrictions on the methods of application were stipulated (EPA, 2015a, p25).

The application parameters used in the *dermal exposure* modelling for this substance were based on the additional control AC3: application parameters set by the EPA for this reassessment APP202097 – *Controls Annex* (EPA, 2015a, pp25-26).

In the HSNO reassessment APP202097 – *Application Supplementary Report B: Human Health Risk Assessment*, the EPA estimated inhalation exposures for a number of scenarios:

- (1) 12 hours after application during ventilation of treated greenhouses, 30 minutes duration wearing full PPE and with/without RPE;
- (2) following 12 hours of ventilation of treated greenhouses (24 hours after application), 8-hours duration wearing PPE;
- (3) 24 hours after application in mushroom houses, 8-hour duration wearing PPE;
- (4) 12 hours after application and after 1 hour ventilation of treated asparagus (post-harvest), 1-hour duration wearing full PPE and with RPE;
- (5) 12 hours after application and after 1 hour ventilation of treated cut flowers, 1-hour duration wearing full PPE and with RPE.

The EPA assessed these inhalation RQs as acceptable if the appropriate timeframes and PPE/RPE were followed, but noted the limitations in the underlying modelling inputs (EPA, 2015b, pp31-43). This EPA assessment of inhalation exposures was accepted here, in the absence of better data.

2.29.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	4.07734	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	0.5	Substance specific
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0014	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Dichlorvos:

AOEL = 0.0014 mg/kg bw/d (EPA, 2015b, p4).

Dermal Absorption (DA) = 30% for all scenarios [0.30] (EPA, 2015b, p5).

DFR = 0.5 $\mu\text{g}/\text{cm}^2$ per kg a.i./ha, based on data from Casida *et al.* (1962) (EPA, 2015b, p9).

k (rate constant for foliar dissipation) = 4.07734, based on data from US EPA (EPA, 2015b, p11).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code AC-3). HSR000211 in APP202097 – *Controls Annex*: indicated a maximum application rate of 0.05g dichlorvos/ m^3 for indoor use; and, 2400g dichlorvos/ha, 3 times per year for outdoor use (EPA, 2015a, pp25-26).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

The EPA assumed that greenhouses had a volume of 25,000m³, and 0.05g dichlorvos/m³ would give a rate of 1000g dichlorvos/ha (EPA, 2015b, p31).

The APP201045: *Summary and Analysis Report* for Greenhouse crops noted that the treated area was 3ha (EPA, 2012s, pp2-3).

The EPA assumed that mushroom houses treated at 0.05g dichlorvos/m³ would give a rate of 1250g dichlorvos/ha (EPA, 2015b, p38).

The APP201045: *Summary and Analysis Report* for Mushrooms noted that the treated area was 1.25ha (EPA, 2012x, p2).

2.29.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000211	Substance Name	Emulsifiable concentrate containing 1000g/litre dichlorvos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP202097	Indoor (Greenhouse)	1000 g a.i./ha ^a	1000 g a.i./ha	Default in absence of any data	63.67	No data	1.0	No data
	Indoor (Non-Greenhouse)	1250 g a.i./ha ^b	1250 g a.i./ha		79.59	No data	1.1	No data
	Outdoor	2400 g a.i./ha; 3 appl'n/year; 7-day interval ^c	2400 g a.i./ha; 3 appl'n/year; 7-day interval		152.82	No data	1.2	No data

^a 1000g a.i./ha assuming a rate of 0.05g/m³ and a greenhouse volume of 25,000m³ (EPA, 2015b, p31);

^b 1250g a.i./ha assuming a rate of 0.05g/m³ and a mushroom house height of 2.5m (EPA, 2015b, p38);

^c EPA, 2015b, p7: persimmons.

2.29.5. Notes

The REI modelling only estimated dermal exposures.

The EPA calculated the inhalation exposure for re-entry workers 12 hours after greenhouse treatment at 0.05g dichlorvos/m³ during 30 minutes (starting ventilation etc.) as 0.00044mg/kg bw/day without RPE, and 0.000022mg/kg bw/day with RPE (95% reduction) (EPA, 2015b, pp31-32).

The EPA calculated the inhalation exposure for re-entry workers 12 hours after the start of ventilation in the greenhouse during 8 hours work activity as 7.8×10^{-16} mg/kg bw/day (EPA, 2015b, pp32-33).

The EPA calculated the inhalation exposure for re-entry workers 24 hours after mushroom house treatment at 0.05g dichlorvos/m³ during 8 hours work activity as 1.71×10^{-3} mg/kg bw/day (EPA, 2015b, p38).

2.29.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000211*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/03E01BB0-AE8B-4A9F-9AF8-4C44FDA4D8E2>

EPA, 2015. *APP202097 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/c45df8b11b/APP202097-Dichlorvos-Decision-FINAL.pdf>

EPA, 2015a. *APP202097 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/be9d6f8186/APP202097-APP202097-Controls-vFINAL-plus-revoked-controls-2015.09.24.pdf>

EPA, 2015b. *APP202097 – Application Supplementary Report B: Human Health Risk Assessment*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/a37f623240/APP202097-APP202097-Application-Supplementary-Report-B-HH-risk-assessment-FINAL.pdf>

2.29.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.30. HSR000212: Aerosol containing 50g/kg dichlorvos

2.30.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000212	Aerosol containing 50g/kg dichlorvos	Indoor crops (greenhouse)	24 hours
		Indoor crops (non-greenhouse)	48 hours
<p>The REIs were based on the calculated RQs.</p> <p>HSR000212 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of dichlorvos:

- Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?
- Are the indoor use rates of 1000 and 1250g dichlorvos/ha in greenhouses and non-greenhouses realistic? If not, what use rates would be used?

2.30.2. Discussion

As of 6 July 2021, we were unable to match HSR000212 to any ACVM registered product with an approved label.

In the HSNO reassessment APP202097 – *Decision* (EPA, 2015, p2) dichlorvos is stated to be an insecticide.

In the HSNO reassessment APP202097 – *Controls Annex* (EPA, 2015a, p64) the following restrictions were stipulated:

AC2: RESTRICTION ON METHOD OF APPLICATION

(1) From 15 September 2020 no person can apply the substance, unless the application is by fully automated equipment.

The application parameters used in the *dermal exposure* modelling for this substance were based on the additional control AC3: application parameters set by the EPA for this reassessment APP202097 – *Controls Annex* (EPA, 2015a, p65).

In the HSNO reassessment APP202097 – *Application Supplementary Report B: Human Health Risk Assessment*, the EPA estimated inhalation exposures for a number of scenarios:

- (1) 12 hours after application during ventilation of treated greenhouses, 30 minutes duration wearing full PPE and with/without RPE;
- (2) following 12 hours of ventilation of treated greenhouses (24 hours after application), 8-hours duration wearing PPE;
- (3) 24 hours after application in mushroom houses, 8-hour duration wearing PPE;
- (4) 12 hours after application and after 1 hour ventilation of treated asparagus (post-harvest), 1-hour duration wearing full PPE and with RPE;
- (5) 12 hours after application and after 1 hour ventilation of treated cut flowers, 1-hour duration wearing full PPE and with RPE.

The EPA assessed these inhalation RQs as acceptable if the appropriate timeframes and PPE/RPE were followed, but noted the limitations in the underlying modelling inputs (EPA, 2015b, pp31-43). This EPA assessment of inhalation exposures was accepted here, in the absence of better data.

2.30.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000211.

2.30.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000212	Substance Name	Aerosol containing 50g/kg dichlorvos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP202097	Indoor (Greenhouse)	1000 g a.i./ha ^a	1000 g a.i./ha	Default in absence of any data	63.67	No data	1.0	No data
	Indoor (Non-Greenhouse)	1250 g a.i./ha ^b	1250 g a.i./ha		79.59	No data	1.1	No data

^a 1000g a.i./ha assuming a rate of 0.05g/m³ and a greenhouse volume of 25,000m³ (EPA, 2015b, p31);
^b 1250g a.i./ha assuming a rate of 0.05g/m³ and a mushroom house height of 2.5m (EPA, 2015b, p38).

2.30.5. Notes

The REI modelling only estimated dermal exposures.

The EPA calculated the inhalation exposure for re-entry workers 12 hours after greenhouse treatment at 0.05g dichlorvos/m³ during 30 minutes (starting ventilation etc.) as 0.00044mg/kg bw/day without RPE, and 0.000022mg/kg bw/day with RPE (95% reduction) (EPA, 2015b, pp31-32).

The EPA calculated the inhalation exposure for re-entry workers 12 hours after the start of ventilation in the greenhouse during 8 hours work activity as 7.8×10^{-16} mg/kg bw/day (EPA, 2015b, pp32-33).

The EPA calculated the inhalation exposure for re-entry workers 24 hours after mushroom house treatment at 0.05g dichlorvos/m³ during 8 hours work activity as 1.71×10^{-3} mg/kg bw/day (EPA, 2015b, p38).

2.30.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000212*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/BA5F1A53-E8D6-4475-8FF5-F8BBE14DD510>

EPA, 2015. *APP202097 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/c45df8b11b/APP202097-Dichlorvos-Decision-FINAL.pdf>

EPA, 2015a. *APP202097 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/be9d6f8186/APP202097-APP202097-Controls-vFINAL-plus-revoked-controls-2015.09.24.pdf>

EPA, 2015b. *APP202097 – Application Supplementary Report B: Human Health Risk Assessment*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/a37f623240/APP202097-APP202097-Application-Supplementary-Report-B-HH-risk-assessment-FINAL.pdf>

2.30.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.31. HSR000213: Emulsifiable concentrate containing 1140g/litre dichlorvos

2.31.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000213	Emulsifiable concentrate containing 1140g/litre dichlorvos	Indoor crops (greenhouse)	24 hours
		Indoor crops (non-greenhouse)	48 hours
		All outdoor crops	48 hours
<p>The REIs were based on the calculated RQs.</p> <p>HSR000213 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of dichlorvos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?
- b) Are the indoor use rates of 1000 and 1250g dichlorvos/ha in greenhouses and non-greenhouses realistic? If not, what use rates would be used?

2.31.2. Discussion

As of 6 July 2021, we were unable to match HSR000213 to any ACVM registered product with an approved label.

In the HSNO reassessment APP202097 – *Decision* (EPA, 2015, p2) dichlorvos is stated to be an insecticide.

In the HSNO reassessment APP202097 – *Controls Annex* restrictions on the methods of application were stipulated (EPA, 2015a, p25).

The application parameters used in the *dermal exposure* modelling for this substance were based on the additional control AC3: application parameters set by the EPA for this reassessment APP202097 – *Controls Annex* (EPA, 2015a, p46).

In the HSNO reassessment APP202097 – *Application Supplementary Report B: Human Health Risk Assessment*, the EPA estimated inhalation exposures for a number of scenarios:

- (1) 12 hours after application during ventilation of treated greenhouses, 30 minutes duration wearing full PPE and with/without RPE;
- (2) following 12 hours of ventilation of treated greenhouses (24 hours after application), 8-hours duration wearing PPE;
- (3) 24 hours after application in mushroom houses, 8-hour duration wearing PPE;
- (4) 12 hours after application and after 1 hour ventilation of treated asparagus (post-harvest), 1-hour duration wearing full PPE and with RPE;
- (5) 12 hours after application and after 1 hour ventilation of treated cut flowers, 1-hour duration wearing full PPE and with RPE.

The EPA assessed these inhalation RQs as acceptable if the appropriate timeframes and PPE/RPE were followed, but noted the limitations in the underlying modelling inputs (EPA, 2015b, pp31-43). This EPA assessment of inhalation exposures was accepted here, in the absence of better data.

2.31.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000211.

2.31.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000213	Substance Name	Emulsifiable concentrate containing 1140g/litre dichlorvos		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP202097	Indoor (Greenhouse)	1000 g a.i./ha ^a	1000 g a.i./ha	Default in absence of any data	63.67	No data	1.0	No data
	Indoor (Non-Greenhouse)	1250 g a.i./ha ^b	1250 g a.i./ha		79.59	No data	1.1	No data
	Outdoor	2400 g a.i./ha; 3 appl'n/year; 7-day interval ^c	2400 g a.i./ha; 3 appl'n/year; 7-day interval		152.82	No data	1.2	No data

^a 1000g a.i./ha assuming a rate of 0.05g/m³ and a greenhouse volume of 25,000m³ (EPA, 2015b, p31);

^b 1250g a.i./ha assuming a rate of 0.05g/m³ and a mushroom house height of 2.5m (EPA, 2015b, p38);

^c EPA, 2015b, p7: persimmons.

2.31.5. Notes

The REI modelling only estimated dermal exposures.

The EPA calculated the inhalation exposure for re-entry workers 12 hours after greenhouse treatment at 0.05g dichlorvos/m³ during 30 minutes (starting ventilation etc.) as 0.00044mg/kg bw/day without RPE, and 0.000022mg/kg bw/day with RPE (95% reduction) (EPA, 2015b, pp31-32).

The EPA calculated the inhalation exposure for re-entry workers 12 hours after the start of ventilation in the greenhouse during 8 hours work activity as 7.8×10^{-16} mg/kg bw/day (EPA, 2015b, pp32-33).

The EPA calculated the inhalation exposure for re-entry workers 24 hours after mushroom house treatment at 0.05g dichlorvos/m³ during 8 hours work activity as 1.71×10^{-3} mg/kg bw/day (EPA, 2015b, p38).

2.31.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000213*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/35AD53A2-5C97-4698-B85C-804C535907B4>

EPA, 2015. *APP202097 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/c45df8b11b/APP202097-Dichlorvos-Decision-FINAL.pdf>

EPA, 2015a. *APP202097 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/be9d6f8186/APP202097-APP202097-Controls-vFINAL-plus-revoked-controls-2015.09.24.pdf>

EPA, 2015b. *APP202097 – Application Supplementary Report B: Human Health Risk Assessment*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202097/a37f623240/APP202097-APP202097-Application-Supplementary-Report-B-HH-risk-assessment-FINAL.pdf>

2.31.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.32. HSR000224: Emulsifiable concentrate containing 450-500g/litre chlorpyrifos

2.32.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000224	Emulsifiable concentrate containing 450-500g/litre chlorpyrifos	Avocado; Pipfruit, Stonefruit	48 hours
		All other crops, except: Avocado; Brassica and Forage crops; Cereals; Cereals and Ryegrass, Grapes (except Table Grapes); Kiwifruit; Lucerne; Maize; Onions; Pasture; Pipfruit, Stonefruit; Squash	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.32.2. Discussion

As of 6 July 2021, several ACVM registered products with an approved label for HSR000224 were found.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p216), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.32.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	See table below	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.01	Substance specific

DA = dermal absorption (expressed as a proportion)	0.01	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Chlorpyrifos:

AOEL = 0.01 mg/kg bw/d (EPA, 2012, p135 citing EFSA, 2005a).

Dermal Absorption (DA) = 1% for spray dilution [0.01] (EPA, 2012, p136 citing EFSA, 2005a).

Soil DT₅₀ = 74 days (EPA, 2012, p146 citing EFSA, 2006a).

Foliar DT₅₀ = see table below (EPA, 2012, pp118-119).

Foliar DT ₅₀ values for chlorpyrifos	
Crops	Foliar DT ₅₀ (days)
Clover and seed crops; Conservation tillage; Pasture; Sports fields; Turf	0.5
Arable; Blackcurrants; Blueberries; Cereals; Cereals spring; Grain; Grapes; Lucerne; Maize; Sweetcorn	0.7
Apples; Avocado; Bean and Pea; Beets; Carrots; Chinese greens; Cucurbits; Kiwifruit; Kumara; Lettuce; Onions; Ornamental trees/shrubs; Pear; Persimmons; Potatoes; Spinach; Squash; Stonefruit; Summerfruit; Swedes	1.6
Brassica forage; Brassica seeds; Field crops; Forage brassica; Kale crops; Rape; Seed crops; Strawberries	3.3
Citrus	4.9
Bulbs	5.5
(EPA, 2012, pp118-119)	

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000224 – Additional controls: indicated a maximum application rate of 1500g chlorpyrifos/ha (EPA, 2013, p216).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.32.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000224	Substance Name	Emulsifiable concentrate containing 450-500g/litre chlorpyrifos		ACVM Register	See x.5.7		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Avocado	Leaf roller caterpillar	50-75mL/100L of water or 1.7L/ha (aerial)	1125g a.i./ha; 5 appl'n; 7-day interval [Avo 13&17] ^{a,b}	Fruit from trees – Search/Reach/Pick	1.82	0.91	1.4	0.0
Brassica and Forage crops	Aphids	300-400mL in 100-200L water/ha	-					

	Nysius (Wheat bug)	1.25L in 100-200L water/ha	600g a.i./ha; 1 appl'n [F&F 7&22] ^{a,c}	Vegetables – Reach/Pick	0.51	0.11	0.0	0.0
	Springtails	200mL in 100-200L water/ha	-					
Cereals	Cereal, Rose and Grain Aphid	300-400mL/ha	200g a.i./ha; 1 appl'n [Ara 9&23] ^{a,c}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.07	NA	0.0	NA
Cereals and Ryegrass, Grapes (except Table Grapes)	Argentine Stem Weevil	1.25L in 100-200L water/ha	625g a.i./ha; 1 appl'n [Ara 3] ^{a,c}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.21	NA	0.0	NA
				Berries – Reach/Pick	0.64	0.16	0.0	0.0
	Aphids, Grapevine Weevil, Leafroller Caterpillar, Mealybug, Scale Crawlers, Thrips	50-75mL/100L of water or 1L/ha; 14 and 21 day intervals	-					

Kiwifruit	Greedy Scale, Leafroller, Passion Vine Hopper	50mL/100L of water; not less than 1L/ha	500g a.i./ha; 2 appl'n; 21-day interval [Kwi 2] _{a,d}	Berries – Reach/Pick	0.51	0.13	0.0	0.0
Lucerne	Aphids	300-450mL in 100-200L water/ha	-					
	Sitona weevil	600-800mL in 100-200L water/ha	400g a.i./ha	Pasture – Mowing	0.07	NA	0.0	NA
Maize	Army caterpillar, Corn Earworm	500mL in 50- 200L water/ha; 14-21 day intervals	-					
	Cutworm	600mL in 50- 200L water/ha	300g a.i./ha; 4 appl'n; 14-day interval [Mai 3] _{a,d}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.10	NA	0.0	NA
Onions	Onion Thrips	1L in 400-500L water/ha; 3-4	500g a.i./ha; 8 appl'n; 5-day	Vegetables – Reach/Pick	0.48	0.10	0.0	0.0

		appl'n; 5-14 day intervals	interval [Oni 5] a,e					
Pasture	Lucerne Flea	200mL in 50-200L water/ha	-					
	Army Caterpillar	400mL in 50-200L water/ha	-					
	Porina Caterpillar	1.25-1.7L in 50-200L water/ha	850g a.i./ha	Pasture – Mowing	0.15	NA	0.0	NA
	Tasmanian Grass Grub	1.25-1.5L in 100-200L water/ha	-					
	Argentine stem weevil	1.25L in 100-200L water/ha	-					
Pipfruit, Stonefruit	Brown Beetle, Leafroller, Mealybug, Scale Crawlers, Woolly Aphid	50mL/100L of water; not less than 2.4L/ha on mature trees; 10-14 day intervals	1200g a.i./ha; 4 appl'n; 14-day interval	Fruit from trees – Search/Reach/Pick	1.86	0.93	1.4	0.0

Squash	Aphids, Caterpillars	500mL/ha in approx. 200L water/ha	250g a.i./ha; 2 appl'n; 7-day intervals [Cuc 3] _{a,c}	Vegetables – Reach/Pick	0.22	0.05	0.0	0.0
Industrial pests	Ants, Slaters, Spiders	120mL in 10L of water or deodorised kerosene	-					
All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Industry source: Critical (rate>label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^d Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^e Industry source: Critical (rate<label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.32.5. Notes

Only the highest use rate was modelled for each crop.

2.32.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000224*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/CB2CDC88-5475-4A06-AD2B-395790C9406D>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.32.7. Approved Substance ACVM Registered Label

P009351 - Genfarm Chlorpyrifos 500

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=49686

P001839: - Lorsban 50 EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&

[p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=51961](https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=51961)

P005913 - Chlorfos 480

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=53603

P004987 - Hortcare Chlorpyrifos 50 EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=44618

P004852 - Chlor-P 480EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=53834

P007842 - Chlorpyrifos 500EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=54812

P009338 - Pyrinex 500 EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55339

P009870 - Rainifos

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55514

P009881 - Synergy Chlor-P

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55396

P008457 - Toppel 500

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=54773

P008369 - Donaghys INSEC480

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2

[2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=52617](#)

P009013 - Kensban 500

[https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=52484](#)

- 2.33. HSR000225: Emulsifiable concentrate containing 480g/litre chlorpyrifos. Also contains xylene

2.33.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000225	Emulsifiable concentrate containing 480g/litre chlorpyrifos. Also contains xylene	Avocado; Pipfruit, Stonefruit	48 hours
		All other crops, except: Avocado; Brassica and Forage crops; Cereals; Cereals and Ryegrass, Grapes (except Table Grapes); Kiwifruit; Lucerne; Maize; Onions; Pasture; Pipfruit, Stonefruit; Squash	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.33.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR000225 was: P007273 – Pyrinex.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p231), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.33.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000224.

2.33.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000225	Substance Name	Emulsifiable concentrate containing 480g/litre chlorpyrifos. Also contains xylene		ACVM Register	P007273 – Pyrinex		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Lucerne	Aphids	300-450mL/ha	-					
	Sitona weevil	600-800mL/ha in 100-200L water	400g a.i./ha	Pasture – Mowing	0.07	NA	0.0	NA
Maize	Army caterpillar, Corn Earworm	500mL/ha	-					

	Cutworm	600mL/ha	300g a.i./ha; 4 appl'n; 14-day interval [Mai 3] a,d	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.10	NA	0.0	NA
Pasture	Army Caterpillar	400mL/ha in 50-200L water	-					
	Lucerne Flea	200mL/ha	-					
	Porina Caterpillar	1.25-1.7L/ha in 50-200L water	850g a.i./ha	Pasture – Mowing	0.15	NA	0.0	NA
	Tasmanian Grass Grub	1.25-1.5L/ha in 100-200L water	-					
	Argentine stem weevil	1.25L in 100-200L water/ha	-					
Cereals	Cereal, Rose and Grain Aphid	300-400mL/ha	200g a.i./ha; 1 appl'n [Ara 9&23] a,c	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.07	NA	0.0	NA
Ryegrass and Cereals	Argentine Stem Weevil	1.25L/ha	625g a.i./ha; 1 appl'n [Ara 3] a,c	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.21	NA	0.0	NA

Avocado	Leaf roller	50-75mL/100L of water or 1.7L/ha (aerial)	1125g a.i./ha; 5 appl'n; 7-day interval [Avo 13&17] ^{a,b}	Fruit from trees – Search/Reach/Pick	1.82	0.91	1.4	0.0
Brassica and Forage crops	Aphids	300-400mL/ha in 100-200L water/ha	-					
	Nysius (Wheat bug)	1.25L/ha in 100-200L water/ha	600g a.i./ha; 1 appl'n [F&F 7&22] ^{a,c}	Vegetables – Reach/Pick	0.51	0.11	0.0	0.0
	Springtails	200mL/ha in 50-200L water/ha	-					
Grapes (except Table Grapes)	Grape vine weevil, Aphids, Leafroller, Mealy bug, Scale Crawlers, Thrips	50-75mL/ha in 100-200L water						
Kiwifruit	Greedy Scale, Leafroller,	50mL/100L	500g a.i./ha; 2 appl'n; 21-day	Berries – Reach/Pick	0.51	0.13	0.0	0.0

	Passion Vine Hopper		interval [Kwi 2] a,d					
Onions	Onion Thrips	1L/ha in 400-500L water/ha; 3-4 appl'n; 5-14 day intervals	500g a.i./ha; 8 appl'n; 5-day interval [Oni 5] a,e	Vegetables – Reach/Pick	0.48	0.10	0.0	0.0
Pipfruit, Stonefruit [pre-flowering]	Mealy bug, Scale Crawlers, Woolly Aphid, Brown Beetle	80mL/100L of water; not less than 2.4L/ha on mature trees; 10-14 day intervals	1200g a.i./ha; 4 appl'n; 14-day interval	Fruit from trees – Search/Reach/Pick	1.86	0.93	1.4	0.0
Winter Squash	Aphids, Caterpillars	500mL/ha in 50-500L water/ha	250g a.i./ha; 2 appl'n; 7-day intervals [Cuc 3] a,c	Vegetables – Reach/Pick	0.22	0.05	0.0	0.0
Industrial pests	Spiders , Ants, Slaters	120mL in 10L of water or deodorised kerosene	-					

All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ; ^b Industry source: Critical (rate>label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^d Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^e Industry source: Critical (rate<label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].								

2.33.5. Notes

Only the highest use rate was modelled for each crop.

2.33.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000225*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/19E25E95-B68E-4C67-B1B6-64AF45082A92>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.33.7. Approved Substance ACVM Registered Label

P007273 - Pyrinex

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=53569

2.34. HSR000226: Soluble concentrate containing 600g/litre methamidophos (Substance A)

2.34.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000226	Soluble concentrate containing 600g/litre methamidophos (Substance A)	Maize, Sweetcorn	56 days
		Potatoes, Kumara; Onions; Tomatoes (outdoor)	70 days
		Cabbage, Cauliflower, Brussel sprouts, Broccoli; Tamarillo	75 days
		All other crops, except: Maize, Sweetcorn, Potatoes, Kumara, Onions, Tomatoes (outdoor),	75 days

Consultation

Given the biological activity of methamidophos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.34.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR000226 were: P005629 – Metafort 60SL and P005915 – Metafos 600.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) methamidophos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p727), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.34.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000203.

2.34.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000226	Substance Name	Soluble concentrate containing 600g/litre methamidophos (Substance A)		ACVM Register	P005629 – Metafort 60SL and P005915 – Metafos 600		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Potatoes	Aphids	800mL/ha; repeat 14-21 days	-					
	Tuber moth, Tomato/Potato psyllid	1.1L/ha; max. 4 appl'n per season	660g a.i./ha; 4 appl'n; 14-day interval [Pot7] ^{a,b}	Vegetables – Reach/Pick	389.89	81.10	65.4	48.2

Kumara	Caterpillars, adult White-fringed weevil, adult black beetle	1.1L/ha; max. 4 appl'n per season; 14-21 day intervals	660g a.i./ha; 4 appl'n; 14-day interval	Vegetables – Reach/Pick	389.89	81.10	65.4	48.2
Cabbage, Cauliflower, Brussel sprouts, Broccoli	Diamondback moth, White butterfly, Tomato fruitworm, Looper caterpillar	1.1-1.5L/ha; 7-10 day intervals	900g a.i./ha; 4 appl'n; 7-day interval [Bra 15] _{a,c}	Vegetables – Reach/Pick	753.82	156.79	72.6	55.4
Tomatoes (Outdoor only)	Tomato fruitworm, Looper caterpillar	1.1-1.5L/ha; max. 2 appl'n per season; 7-10 day intervals	900g a.i./ha; 2 appl'n; 7-day interval [FTo 6] _{a,b}	Vegetables – Reach/Pick	589.42	122.60	69.9	52.7
Tamarillo	Tomato/Potato psyllid	160mL/100L in 500-900L/ha; max. 2 appl'n per season; 14 day interval	900g a.i./ha; 2 appl'n; 14-day interval	Fruit from trees – Search/Reach/Pick	887.93	443.97	74.4	66.8

Maize	Army caterpillar, Aphids	1L/ha; max. 2 appl'n per season	600g a.i./ha; 2 appl'n; 7-day interval [Mai 9] _{a,b}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	157.18	NA	55.5	NA
Sweetcorn	Aphids, Corn ear worm, Tomato fruit worm, Green vegetable bug	1L/ha; max. 2 appl'n per season; 10 day interval	600g a.i./ha; 2 appl'n; 10-day interval [Swe 14] _{a,b}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	144.18	NA	54.5	NA
Onions	Thrips	1L/ha; max. 3 appl'n per season; 7 day interval	600g a.i./ha; 3 appl'n; 7-day interval	Vegetables – Reach/Pick	464.67	96.65	67.3	50.1
All crops: maximum stipulated application rate in APP201045		900 g a.i./ha; 1 appl'n/year	900 g a.i./ha; 1 appl'n/year	Default in absence of any data	802.29	No data	73.3	No data
<p>^a Application rate from relevant EPA, 2012. APP201045: Summary and Analysis Report;</p> <p>^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: Summary and Analysis Report];</p> <p>^c Label (non-critical) [relevant EPA, 2012. APP201045: Summary and Analysis Report].</p>								

2.34.5. Notes

2.34.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000226*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/23109DC1-2C6F-4C69-BB1D-FAB82971C9A8>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.34.7. Approved Substance ACVM Registered Label

P005629 – Metafort 60SL

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=42966

P005915 – Metafos 600

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=44959

2.35. HSR000441: Suspension concentrate containing 100g/litre carbaryl

2.35.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000441	Suspension concentrate containing 100g/litre carbaryl	All crops	32 days

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.35.2. Discussion

As of 6 July 2021, we were unable to match HSR000441 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p92).

2.35.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.01	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Carbaryl:

AOEL = 0.01 mg/kg bw/d (EPA, 2012, p135 citing EFSA, 2006a).

Dermal Absorption (DA) = 10% for spray dilution [0.10] (EPA, 2012, p135 citing EFSA, 2006a).

Foliar DT₅₀ = 5.1 days (EPA, 2012, spreadsheet of compiled data).

Soil DT₅₀ = 115.5 days (EPA, 2012, p146 citing EFSA, 2006a).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000441 – Additional controls: indicated a maximum application rate of 2700g carbaryl/ha; 3 applications/year; with no minimum interval stipulated, so a 7-day interval was modelled (EPA, 2013, p92).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.35.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000441	Substance Name	Suspension concentrate containing 100g/litre carbaryl		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2700 g a.i./ha; 3 appl'n/year; minimum 7-day interval	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

2.35.5. Notes

2.35.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000441*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/882C6667-24B4-4454-9BB0-82282BA7B502>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.35.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.36. HSR000450: Suspension concentrate containing 500g/litre carbaryl (Substance A)

2.36.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000450	Suspension concentrate containing 500g/litre carbaryl (Substance A)	All crops	32 days

The REI was based on the calculated RQ.

HSR000450 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.36.2. Discussion

As of 6 July 2021, we were unable to match HSR000450 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, pp107-108).

2.36.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000441.

2.36.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000450	Substance Name	Suspension concentrate containing 500g/litre carbaryl (Substance A)		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2700 g a.i./ha; 3 appl'n/year; minimum 7-day interval	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

2.36.5. Notes

2.36.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000450*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/F9917361-E19A-40F5-B9E7-9710B16A88BA>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.36.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.37. HSR000584: Soluble concentrate containing 200g/litre methomyl

2.37.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000584	Soluble concentrate containing 200g/litre methomyl	Pasture	13 days
		Cereals; Maize, Sweetcorn	19 days
		Grapes; Lettuce; Beans; Bush and Canefruit; Cabbage, Cauliflower; Tomatoes (outdoor)	26 days
		Greenhouse crops; Strawberries	30 days
		All other crops, except: Pasture; Cereals; Maize, Sweetcorn; Grapes; Lettuce; Beans; Bush and Canefruit; Cabbage, Cauliflower; Tomatoes (outdoor);	30 days

Consultation

Given the biological activity of methomyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.37.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR000584 were: P007639 – Orion Methomyl 200SL and P009767 – Lumina Plus.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) methomyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p745).

2.37.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific
DA = dermal absorption (expressed as a proportion)	0.15	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Methomyl:

AOEL = 0.0025 mg/kg bw/d (EPA, 2012a, p138 citing EFSA, 2009).

Dermal Absorption (DA) = 15% [0.15] (EPA, 2012a, p138 citing EFSA, 2009).

Foliar DT₅₀ = 5.1 days (EPA, 2012, compiled data).

Soil DT₅₀ = 45 days (EPA, 2012, p147 citing PMRA, 2009).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000584 – Additional controls: indicated a maximum application rate of 480g methomyl/ha, once per crop cycle (EPA, 2013, p745).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.37.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000584	Substance Name	Soluble concentrate containing 200g/litre methomyl		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Beans	Green peach aphid, Looper caterpillar	1.5-2L/ha; repeat as required	400g a.i./ha; 2 appl'n; 7-day interval [B&P 1] _{a,b}	Vegetables – Reach/Pick	28.52	5.93	24.7	13.1
Cabbage, Cauliflower	Green peach aphid, Looper caterpillar	1.5-2L/ha; repeat as required	400g a.i./ha; 4 appl'n; 7-day interval [Bra 4] _{a,c}	Vegetables – Reach/Pick	32.77	6.82	25.7	14.1

Cereals	Army caterpillar, Greasy cutworm	1.5-2L/ha; repeat as required	400g a.i./ha; 4 appl'n; 7-day interval [Ara 4] ^{a,c}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	13.11	NA	18.9	NA
Glasshouse crops: Capsicums, Cucumbers, Tomatoes	Whitefly	120mL/100L; 4- day intervals	480g a.i./ha; 12 appl'n; 7-day interval [GHC 1,4,10] ^{a,b}	Vegetables – Reach/Pick	40.22	8.37	27.2	15.6
Grapes	Leafroller caterpillar, Mealy bug	120- 180mL/100L; 14-day intervals	360g a.i./ha; 4 appl'n; 14-day interval [Gra 5] _{a,b}	Berries – Reach/Pick	26.10	6.52	24.0	13.8
Lettuce	Green peach aphid	2L/ha; repeat as required	400g a.i./ha; 4 appl'n; 14-day interval [L&S 2] _{a,c}	Vegetables – Reach/Pick	24.17	5.03	23.4	11.9
	Looper caterpillar	1.5-2L/ha; repeat as required						
Maize, Sweetcorn	Corn earworm, Greasy cutworm	1.5-2L/ha; repeat as required	400g a.i./ha; 4 appl'n; 7-day	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	13.11	NA	18.9	NA

			interval [Mai 4] a,c					
Pasture	Armyworm caterpillar	1.5-2L/ha; repeat as required	400g a.i./ha; 2 appl'n; 7-day interval [Par 67] a,c	Pasture – Mowing	5.70	NA	12.8	NA
Bush and Canefruit	Bud moth, Leafroller caterpillar	120mL/100L; full season program	480g a.i./ha; 1 appl'n [Ber 1&8] a,b	Berries – Reach/Pick	29.62	7.41	24.9	14.7
Strawberries	Leafroller caterpillar, Aphids	120mL/100L; full season program	480g a.i./ha; 12 appl'n; 6-day interval [Str 9] a,d	Berries – Reach/Pick	53.13	13.28	29.2	19.0
Tomatoes	Green peach aphid	2L/ha; repeat as required	400g a.i./ha; 4 appl'n; 7-day interval [FTo 2] a,c	Vegetables – Reach/Pick	32.77	6.82	25.7	14.1
	Looper caterpillar, Tomato fruit worm	1.5-2L/ha; repeat as required						
All crops: maximum		480 g a.i./ha; 1 appl'n/year	480 g a.i./ha; 1 appl'n/year	Default in absence of any data	51.35	No data	29.0	No data

stipulated application rate in APP201045								
<p>^a Application rate from relevant EPA, 2012. APP201045: Summary and Analysis Report;</p> <p>^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: Summary and Analysis Report];</p> <p>^c Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^d Industry source: Critical (rate>label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.37.5. Notes

2.37.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000584*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5178A77C-AC0D-4694-98F7-3BC601AD4AC3>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.37.7. Approved Substance ACVM Registered Label

P007639 – Orion Methomyl 200SL

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=45425

P009767 – Lumina Plus

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=51336

- 2.38. HSR000594: Wettable powder containing 115g/kg carbaryl, 250g/kg copper as copper oxychloride and 284g/kg sulphur

2.38.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000594	Wettable powder containing 115g/kg carbaryl, 250g/kg copper as copper oxychloride and 284g/kg sulphur	All crops	32 days
<p>The REI modelling was driven by carbaryl with the lower AOEL. The REI was based on the calculated RQ.</p> <p>HSR000594 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.38.2. Discussion

As of 6 July 2021, we were unable to match HSR000594 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p119).

The REI modelling was driven by carbaryl with the lower AOEL (0.01mg/kg bw/day *cf* copper oxychloride, 0.072mg/kg bw/day (EFSA, 2008, p3); and, sulphur, *not necessary* (EFSA, 2008a, p2).

2.38.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000441.

2.38.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000594	Substance Name	Wettable powder containing 115g/kg carbaryl, 250g/kg copper as copper oxychloride and 284g/kg sulphur		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2700 g a.i./ha; 3 appl'n/year; minimum 7-day interval	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

2.38.5. Notes

2.38.6. Approved Substance Specific References

EFSA, 2008. *Conclusion on the peer review of copper compounds*. EFSA Scientific Report 187, 1-101. <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2008.187r>

EFSA, 2008a. *Peer review of the pesticide risk assessment of the active substance sulfur*. EFSA Scientific Report (2008) 221, 2-70. <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2009.221r>

EPA HSNO Classifications: HSR000594. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/08605769-272E-4106-8044-7425B01A9311>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.38.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.39. HSR000680: Suspension concentrate containing 500g/litre carbaryl
(Substance C)

2.39.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000680	Suspension concentrate containing 500g/litre carbaryl (Substance C)	Maize/Sweetcorn	14 days
		Strawberries; Ornamental flowers; Bushfruit and Canefruit; Tamarillos; Cabbages and Field Tomatoes	26 days
		Apples, Pears and Nashi; Avocados; Persimmons; Stonefruit	34 days
		All other crops, except: Maize/Sweetcorn; Strawberries; Ornamental flowers; Bushfruit and Canefruit; Tamarillos; Cabbages and Field Tomatoes; Apples, Pears and Nashi; Avocadoes; Persimmons; Stonefruit	32 days
The REIs were based on the calculated RQs.			

HSR000680 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1):
the spray must be completely dry on the affected surfaces before re-entry; and,
waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

P004042 – Sevin Flo has label claims for apple thinning during the 14 days from petal fall, this scenario was not modelled as re-entry work was not anticipated during this time.

- b) Was this assumption valid?
- c) If not, what activity could be expected, and what TC value would be most appropriate?

2.39.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR000680 was: P004042 – Sevin Flo.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p134), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

The GAP data in the crop specific APP201045: *Summary and Analysis Report* for persimmons (EPA, 2012ad) gave potentially the highest absolute rate: 3600g a.i./ha; 4 applications; 7-day interval; and the claim for stonefruit (EPA, 2012af) gave the highest cumulative dose: 2400g a.i./ha; 5 applications; 3-day interval. Both these rates have the potential to exceed the maximum in the additional control R-3: application parameters.

2.39.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific

DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.01	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Carbaryl:

AOEL = 0.01 mg/kg bw/d (EPA, 2012, p135 citing EFSA, 2006a).

Dermal Absorption (DA) = 10% for spray dilution [0.10] (EPA, 2012, p135 citing EFSA, 2006a).

Foliar DT_{50} = 5.1 days (EPA, 2012, spreadsheet of compiled data).

Soil DT_{50} = 115.5 days (EPA, 2012, p146 citing EFSA, 2006a).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000680 – Additional controls: indicated a maximum application rate of 2700g carbaryl/ha; 3 applications/year; with no minimum interval stipulated, so a 7-day interval was modelled (EPA, 2013, p134).

The Transfer Coefficient for “Default in absence of any data” ($5,200 \text{ cm}^2/\text{h}$) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.39.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000680	Substance Name	Suspension concentrate containing 500g/litre carbaryl (Substance C)		ACVM Register	P004042		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears and Nashi	Leafroller caterpillars; Mealy bug and Scale insects (crawlers)	160-240ml / 100 litres; 240ml / 100 litres [repeat applications not indicated]	2400g a.i./ha; 4 applications; 7-day interval [Pip1] ^{a,b}	Fruit from trees – Search/Reach/Pick	58.99	29.49	30.0	24.9
Avocadoes	Leafroller caterpillars,	160ml / 100 litres; Sevin Flo is best used in a	2400g a.i./ha; 4 applications; 7-	Fruit from trees – Search/Reach/Pick	58.99	29.49	30.0	24.9

	Mealy bug, Thrips and Scale insects	regular preventative programme; Thorough tree coverage is essential. Increased spray volume will be required for close planted trees.	day interval [Avo5] ^{a,b} [also 2700g a.i/ha; 3 applications; 7- day interval ^a]					
Bushfruit and Canefruit	Leafroller caterpillars, other caterpillars, Raspberry bud moth	240ml/ 100 litres; Apply at 14 day intervals from 100% petal fall (flowering finished) until immediately before harvest	2400g a.i/ha; 4 applications; 14- day interval [Ber6] ^{a,b}	Berries – Reach/Pick	29.00	7.25	24.8	14.6
Maize/Sweetcorn	Army caterpillar and corn earworms	1.6 – 2.4 litres per hectare (240ml /100	1200g a.i/ha; 4 applications; 7-	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	6.55	NA	13.8	NA

		litres) [repeat applications not indicated]	day interval [Mai2] ^{a,b}					
Ornamental flowers	Leafroller and other caterpillars. Crawler stage of Scale insects	240ml / 100 litres [repeat applications not indicated]	1200g a.i/ha; 4 applications; 14-day interval [Orn1] ^{a,c}	Ornamentals – Cut/Sort/Bundle/Carry	24.17	6.77	23.4	14.1
Persimmons	Leafroller caterpillars, Mealy bug, Thrips, Scale crawlers	240ml / 100 litres; to control Mealy bug and scale Sevin Flo is best used in a regular preventative programme	3600g a.i/ha; 4 applications; 7-day interval [Per1] ^{a,b}	Fruit from trees – Search/Reach/Pick	88.48	44.24	33.0	27.9
Stonefruit	Leafroller caterpillars; Oriental fruit moth	160-240ml / 100 litres; 240ml / 100 litres; Apply from fruit set to	2400g a.i/ha; 5 applications; 3-day interval [StF5] ^{a,c}	Fruit from trees – Search/Reach/Pick	96.16	48.09	33.6	28.5

		harvest at 14 day intervals						
Strawberries	Leafroller caterpillars; Oriental fruit moth	240ml / 100 litres; Repeat as necessary	1200g a.i./ha; 4 applications; 7-day interval [Str1] ^{a,b}	Berries – Reach/Pick	19.66	4.92	21.9	11.7
Tamarillos	Grass grub beetles, leafroller caterpillars and other caterpillars	240ml / 100 litres; Repeat as necessary	1200g a.i./ha; 4 applications; 7-day interval [Tam3] ^{a,b}	Fruit from trees – Search/Reach/Pick	29.49	14.75	24.9	19.8
Cabbages and Tomatoes	Tomato fruitworm, looper caterpillar and other caterpillars	2.4-4.8 litres hectare (240ml/100 litres) [repeat applications not indicated]	2400g a.i./ha; 4 applications; 7-day interval [FTo] ^{a,b}	Vegetables – Reach/Pick	32.77	6.82	25.7	14.1
All other crops: maximum stipulated		2700 g a.i./ha; 3 appl'n/year;	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

application rate in APP201045		minimum 7-day interval						
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.39.5. Notes

2.39.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000680*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/E8E66BB1-15FC-44B2-B811-AB26E6E7AFCB>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.39.7. Approved Substance ACVM Registered Label

P004042 – Sevin Flo

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=47875

2.40. HSR000681: Suspension concentrate containing 500g/litre carbaryl
(Substance B)

2.40.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000681	Suspension concentrate containing 500g/litre carbaryl (Substance B)	Maize/Sweetcorn	14 days
		Strawberries; Ornamental flowers; Bushfruit and Canefruit; Tamarillos; Cabbages and Field Tomatoes	26 days
		Apples, Pears and Nashi; Avocados; Persimmons; Stonefruit	34 days
		All other crops, except: Maize/Sweetcorn; Strawberries; Ornamental flowers; Bushfruit and Canefruit; Tamarillos; Cabbages and Field Tomatoes; Apples, Pears and Nashi; Avocados; Persimmons; Stonefruit	32 days

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

P004042 – Sevin Flo has label claims for apple thinning during the 14 days from petal fall, this scenario was not modelled as re-entry work was not anticipated during this time.

- b) Was this assumption valid?
- c) If not, what activity could be expected, and what TC value would be most appropriate?

2.40.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR000681 was: P008797 – Growchem Carbaryl.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p148), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

The GAP data in the crop specific APP201045: *Summary and Analysis Report* for persimmons (EPA, 2012ad) gave potentially the highest absolute rate: 3600g a.i./ha; 4 applications; 7-day interval; and the claim for stonefruit (EPA, 2012af) gave the highest cumulative dose: 2400g a.i./ha; 5 applications; 3-day interval. Both these rates have the potential to exceed the maximum in the additional control R-3: application parameters.

2.40.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific

DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.01	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Carbaryl:

AOEL = 0.01 mg/kg bw/d (EPA, 2012, p135 citing EFSA, 2006a).

Dermal Absorption (DA) = 10% for spray dilution [0.10] (EPA, 2012, p135 citing EFSA, 2006a).

Foliar DT_{50} = 5.1 days (EPA, 2012, spreadsheet of compiled data).

Soil DT_{50} = 115.5 days (EPA, 2012, p146 citing EFSA, 2006a).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000681 – Additional controls: indicated a maximum application rate of 2700g carbaryl/ha; 3 applications/year; with no minimum interval stipulated, so a 7-day interval was modelled (EPA, 2013, p1482).

The Transfer Coefficient for “Default in absence of any data” ($5,200 \text{ cm}^2/\text{h}$) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.40.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000681	Substance Name	Suspension concentrate containing 500g/litre carbaryl (Substance B)		ACVM Register	P008797		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears and Nashi	Leafroller caterpillars; Mealy bug and Scale insects (crawlers)	160-240ml / 100 litres; 240ml / 100 litres [repeat applications not indicated]	2400g a.i./ha; 4 applications; 7-day interval [Pip1] ^{a,b}	Fruit from trees – Search/Reach/Pick	58.99	29.49	30.0	24.9
Avocadoes	Leafroller caterpillars,	160ml / 100 litres; Sevin Flo is best used in a	2400g a.i./ha; 4 applications; 7-	Fruit from trees – Search/Reach/Pick	58.99	29.49	30.0	24.9

	Mealy bug, Thrips and Scale insects	regular preventative programme; Thorough tree coverage is essential. Increased spray volume will be required for close planted trees.	day interval [Avo5] ^{a,b} [also 2700g a.i/ha; 3 applications; 7- day interval ^a]					
Bushfruit and Canefruit	Leafroller caterpillars, other caterpillars, Raspberry bud moth	240ml/ 100 litres; Apply at 14 day intervals from 100% petal fall (flowering finished) until immediately before harvest	2400g a.i/ha; 4 applications; 14- day interval [Ber6] ^{a,b}	Berries – Reach/Pick	29.00	7.25	24.8	14.6
Maize/Sweetcorn	Army caterpillar and corn earworms	1.6 – 2.4 litres per hectare (240ml /100	1200g a.i/ha; 4 applications; 7-	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	6.55	NA	13.8	NA

		litres) [repeat applications not indicated]	day interval [Mai2] ^{a,b}					
Ornamental flowers	Leafroller and other caterpillars. Crawler stage of Scale insects	240ml / 100 litres [repeat applications not indicated]	1200g a.i/ha; 4 applications; 14-day interval [Orn1] ^{a,c}	Ornamentals – Cut/Sort/Bundle/Carry	24.17	6.77	23.4	14.1
Persimmons	Leafroller caterpillars, Mealy bug, Thrips, Scale crawlers	240ml / 100 litres; to control Mealy bug and scale Sevin Flo is best used in a regular preventative programme	3600g a.i/ha; 4 applications; 7-day interval [Per1] ^{a,b}	Fruit from trees – Search/Reach/Pick	88.48	44.24	33.0	27.9
Stonefruit	Leafroller caterpillars; Oriental fruit moth	160-240ml / 100 litres; 240ml / 100 litres; Apply from fruit set to	2400g a.i/ha; 5 applications; 3-day interval [StF5] ^{a,c}	Fruit from trees – Search/Reach/Pick	96.16	48.09	33.6	28.5

		harvest at 14 day intervals						
Strawberries	Leafroller caterpillars; Oriental fruit moth	240ml / 100 litres; Repeat as necessary	1200g a.i./ha; 4 applications; 7-day interval [Str1] ^{a,b}	Berries – Reach/Pick	19.66	4.92	21.9	11.7
Tamarillos	Grass grub beetles, leafroller caterpillars and other caterpillars	240ml / 100 litres; Repeat as necessary	1200g a.i./ha; 4 applications; 7-day interval [Tam3] ^{a,b}	Fruit from trees – Search/Reach/Pick	29.49	14.75	24.9	19.8
Cabbages and Tomatoes	Tomato fruitworm, looper caterpillar and other caterpillars	2.4-4.8 litres hectare (240ml/100 litres) [repeat applications not indicated]	2400g a.i./ha; 4 applications; 7-day interval [FTo] ^{a,b}	Vegetables – Reach/Pick	32.77	6.82	25.7	14.1
All other crops: maximum stipulated		2700 g a.i./ha; 3 appl'n/year;	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

application rate in APP201045		minimum 7-day interval						
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.40.5. Notes

2.40.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000681*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/4B3471B0-0AF0-4556-8F5A-EE37E37AED47>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.40.7. Approved Substance ACVM Registered Label

P008797 – Growchem Carbaryl

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=52041

2.41. HSR000703: Water dispersible granule containing 500g/kg pirimicarb (Substance B)

2.41.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000703	Water dispersible granule containing 500g/kg pirimicarb (Substance B)	Cucurbits ^a ; Flowering crops – Clovers ^a , Lucerne ^a , Peas ^a , Broad beans ^a , Forage brassicas ^a , Oilseed rape ^a ; Kale ^a , Swedes ^a , Turnips ^a , Cereals ^a ; Beans ^a ; Potatoes ^a ; Vegetable brassicas ^b , Lettuce ^b , Tomatoes ^b	24 hours
		Stonefruit	4 days ^b
		Apples	12 days ^b
		All other crops, except: Cucurbits; Flowering crops – Clovers, Lucerne, Peas, Broad beans, Forage brassicas, Oilseed rape; Kale, Swedes,	13 days

		Turnips, Cereals; Beans; Potatoes; Vegetable brassicas, Lettuce, Tomatoes; Stonefruit; Apples	
<p>^a The REI of 24 hours is recommended because HSR000703 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p> <p>^b The REIs were based on the calculated RQs.</p>			

Consultation

Given the biological activity of pirimicarb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.41.2. Discussion

As of 6 July 2021, several ACVM registered products with an approved label for HSR000703 were found.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) pirimicarb is included as an insecticide.

The application parameters used in the modelling for this substance were based on the label claims from the ACVM registered products.

2.41.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.035	Substance specific
DA = dermal absorption (expressed as a proportion)	0.13	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Pirimicarb:

AOEL = 0.035 mg/kg bw/d (EPA, 2012a, p140 citing EFSA, 2006e).

Dermal Absorption (DA) = 13% [0.13] (EPA, 2012a, p140 citing Footprint, 2011).

Foliar DT₅₀ = 5.1 days (EPA, 2012, complied data).

Soil DT₅₀ = 143 days (EPA, 2012, p147 citing EFSA, 2004c).

For the “All other crops” scenario, potential exposures were modelled on the highest application rate found on the approved labels.

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.41.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000703	Substance Name	Water dispersible granule containing 500g/kg pirimicarb (Substance B)	ACVM Register	See x.5.7			
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cucurbits	Aphids	250g/ha; 3 appl'n; 10-14 day intervals	125g a.i./ha; 3 appl'n; 7-day interval [Cuc 4&6] ^{a,b}	Vegetables – Reach/Pick	0.61	0.13	0.0	0.0
Flowering crops – Clovers, Lucerne, Peas, Broad beans, Forage	Aphids	250g/ha	125g a.i./ha; 4 appl'n; 7-day interval [F&F 11] ^{a,b}	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
				Pasture – Mowing	0.13	NA	0.0	NA

brassicas, Oilseed rape								
Lucerne, Kale, Swedes, Turnips, Cereals	Aphids	250g/ha	125g a.i./ha; 3 appl'n; 7-day interval [Ara 7] a,b	Vegetables – Reach/Pick	0.61	0.13	0.0	0.0
				Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.24	NA	0.0	NA
Peas, Broad beans, Oilseed rape, Beans	Aphids	250g/ha	125g a.i./ha; 4 appl'n; 7-day interval [B&P 7] a,b	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
Potatoes	Aphids	500g/ha	250g a.i./ha; 2 appl'n; 14-day interval [Pot 10] a,b	Vegetables – Reach/Pick	0.91	0.19	0.0	0.0
Stonefruit	Aphids	20g/100L water; Min. 2000L water/ha	250g a.i./ha; 3 appl'n; 18-day interval [StF 10] a,b	Fruit from trees – Search/Reach/Pick	1.57	0.78	3.3	0.0

Apples	Aphids	50g/100L water; Min. 1kg/ha	500g a.i./ha; 4 appl'n; 7-day interval [Pip 7] ^{a,b}	Fruit from trees – Search/Reach/Pick	4.56	2.28	11.2	6.1
Vegetable brassicas, Lettuce, Tomatoes	Aphids	250g/ha	125g a.i./ha; 3 appl'n; 10-day interval [Bra 18] _{a,b}	Vegetables – Reach/Pick	1.05	0.22	0.4	0.0
All crops: highest application rate found on the approved labels			500g a.i./ha; 4 appl'n; 7-day interval	Default in absence of any data	5.27	No data	12.2	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].								

2.41.5. Notes

2.41.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000703*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/8571BA55-B2A3-4A6A-B678-707BA656008E>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.41.7. Approved Substance ACVM Registered Label

P007109 – Pirimisect 500g/kg WDG

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=50141

P005948 – Prohive

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=45959

P007709 – Aphidex WG

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=49524

P009477 – Pirahid Xtra

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=51529

P009849 – Aphidex WG [same as P007709 ?]

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55248

P001904 – Pirimor 50

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55497

2.42. HSR000704: Water dispersible granule containing 500g/kg pirimicarb (Substance A)

2.42.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000704	Water dispersible granule containing 500g/kg pirimicarb (Substance A)	All crops	13 days

Consultation

Given the biological activity of pirimicarb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.42.2. Discussion

As of 6 July 2021, we were unable to match HSR000703 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) pirimicarb is included as an insecticide.

The application parameters used in the modelling for this substance were based on the highest label claim from similar approved substances with ACVM registered products.

2.42.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000703.

2.42.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000704	Substance Name	Water dispersible granule containing 500g/kg pirimicarb (Substance A)	ACVM Register	None			
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: highest application rate found on the approved labels			500g a.i./ha; 4 appl'n; 7-day interval	Default in absence of any data	5.27	No data	12.2	No data

2.42.5. Notes

2.42.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000704*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/FDD58586-F413-4679-8DEC-EA1D7CE7D4BD>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.42.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.43. HSR000791: Soluble concentrate containing 240g/litre oxamyl

2.43.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000791	Soluble concentrate containing 240g/litre oxamyl	All crops	48 days

Consultation

Given the biological activity of oxamyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.43.2. Discussion

As of 6 July 2021, we were unable to match HSR000791 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) oxamyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p770).

2.43.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.13591	Substance specific
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.001	Substance specific
DA = dermal absorption (expressed as a proportion)	0.05	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Oxamyl:

AOEL = 0.001 mg/kg bw/d (EPA, 2012a, p138 citing EFSA, 2005b).

Dermal Absorption (DA) = 5% [0.05] (EPA, 2012a, p138 citing EFSA, 2003b).

Foliar DT₅₀ = 5.1 days (EPA, 2012, complied data).

Soil DT₅₀ = 11.5 days (EPA, 2012, p147 citing EFSA, 2004b).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). HSR000791 – Additional controls: indicated a maximum application rate of 6720g oxamyl/ha (EPA, 2013, p770).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.43.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000791	Substance Name	Soluble concentrate containing 240g/litre oxamyl		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		6720 g a.i./ha; 1 appl'n/year	6720 g a.i./ha; 1 appl'n/year	Default in absence of any data	599.04	No data	47.1	No data

2.43.5. Notes

2.43.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000791*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5F8A1499-A6C6-4DAB-BEFF-13E0FD6683E4>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.43.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.44. HSR000956: Nemaicur 400EC

2.44.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000956	Nemaicur 400EC	Carrots, Parsnips, Potatoes	92 days
		All other crops, except: Carrots, Parsnips, Potatoes	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.44.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR000956 was: P002690 – NemaCur 400EC.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p596), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.44.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000198.

2.44.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000956	Substance Name	Nemacur 400EC		ACVM Register	P002690 – Nemacur 400EC		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Carrots and Parsnips – Pre-emergence	Root node nematode	20 L/ha in 200-300 L/ha water	8000g a.i./ha; maximum 1 application [C&P8] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5
Potatoes – Pre-emergence	Potato cyst nematode	20 L/ha	8000g a.i./ha; maximum 1 application [Pot11] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5

All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data
<p>^a Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>;</p> <p>^b Industry source: Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].</p>								

2.44.5. Notes

2.44.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000956*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/174114A2-4FC8-4AC1-BD59-22723D848559>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.44.7. Approved Substance ACVM Registered Label

P002690 – Nemaicur 400EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=42894

2.45. HSR000965: Perfekthion S-1

2.45.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR000965	Perfekthion S-1	All crops	49 days

Consultation

Given the biological activity of dimethoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.45.2. Discussion

As of 6 July 2021, we were unable to match HSR000965 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) dimethoate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p537).

2.45.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000188.

2.45.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR000965	Substance Name	Perfekthion S-1		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		400 g a.i./ha; 3 appl'n/year; 7-day interval	400 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	28.45	No data	48.3	No data

2.45.5. Notes

2.45.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR000965*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/936E2E30-1CE9-4D8B-BD8B-AD815C156B32>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.45.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.46. HSR002480: Fenafos 400

2.46.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR002480	Fenafos 400	Carrots, Parsnips, Potatoes	92 days
		All other crops, except: Carrots, Parsnips, Potatoes	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.46.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR002480 was: P007537 – Fenafos 400.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p570), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.46.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000198.

2.46.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR002480	Substance Name	Fenafos 400		ACVM Register	P007537 – Fenafos 400		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Carrots and Parsnips – Pre-emergence	Root node nematode	20 L/ha in 200-300 L/ha water	8000g a.i./ha; maximum 1 application [C&P8] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5
Potatoes – Pre-emergence	Potato cyst nematode	20 L/ha	8000g a.i./ha; maximum 1 application [Pot11] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5

All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data
<p>^a Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].</p>								

2.46.5. Notes

2.46.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR002480*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B7B9E413-D6C5-440D-BDE7-4568CCBC2BAD>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.46.7. Approved Substance ACVM Registered Label

P007537 – Fenafos 400

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=43578

2.47. HSR002481: Diazamax 800

2.47.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR002481	Diazamax 800	Cereals	39 days
		Pasture; Forage brassicas	49 days
		Seed crops (grass, clover, vegetables, ryegrass)	53 days
		Apples, Pears; Tomatoes (outdoor)	68 days
		All other crops, except: Cereals; Forage brassicas; Pasture; Apples, Pears; Seed crops (grass, clover, vegetables, ryegrass); Tomatoes (outdoor)	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.47.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR002481 was P007724 – Diazol 800.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p459), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.47.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.47.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR002481	Substance Name	Diazamax 800		ACVM Register	P007724 – Diazol 800		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears (Non-bearing)	Overwintering San Jose scale, woolly apple aphid, aphids, leaf curling midge, mealy bug	60 mL/100L; at green tip, thereafter use Diazol 500 EW	960 a.i./ha; 4 applications; 7-day intervals [Pip9] ^{b,c}	Search/Reach/Pick	434.20	217.10	66.6	59.0

Cereals	Cereal aphids	800 mL/ha	640g a.i./ha; 1 application	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	32.91	NA	38.3	NA
Forage brassicas	Army caterpillar, diamondback moth	800 mL/ha	640g a.i./ha; 1 application	Vegetables – Reach/Pick	82.29	17.12	48.4	31.1
	Springtails	350 mL/ha	280g a.i./ha; 1 application [Pas18] ^{c,d}	Vegetables – Reach/Pick	36.00	7.49	39.3	22.1
Pasture	Grass grub	3 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Pasture – Mowing	61.71	NA	45.2	NA
	Porina caterpillar	1-1.5 L/ha	1200g a.i./ha; 1 application [Pas14] ^{c,d}	Pasture – Mowing	30.86	NA	37.6	NA
	Army caterpillar	800 mL/ha	640g a.i./ha; 1 application [Pas17] ^{b,d}	Mowing	16.46	NA	30.7	NA

	Lucerne flea	350 mL/ha	280g a.i./ha; 1 application [Pas18] ^{c,d}	Pasture – Mowing	7.20	NA	21.6	NA
Seed crops (grass, clover, vegetables, ryegrass)	Grass grub, carrot rust fly (carrot and parsnip seed crops only)	3 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	123.43	NA	52.8	NA
Tomatoes (outdoor)	Aphids, caterpillars, thrips	1 L/ha	900g a.i./ha; 4 applications; 7-day interval [FTo7] ^{c,g}	Berries – Reach/Pick	271.37	61.4	67.84	46.2
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data
^a Crop growth stage only stipulated if detailed on the label; ^b Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i> ; ^c Industry source: Critical (rate>label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>] ^d Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].								

2.47.5. Notes

2.47.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR002481*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/43FE577B-0445-4C1C-9F01-2F634EF58F12>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.47.7. Approved Substance ACVM Registered Label

P007724 – Diazol 800 Insecticide

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=46032

2.48. HSR007696: Wettable powder containing 150-200g/kg carbaryl and 150-200g/kg mancozeb

2.48.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR07696	Wettable powder containing 150-200g/kg carbaryl and 150-200g/kg mancozeb	All crops	32 days
The REI modelling was driven by carbaryl with the higher DA.			

Consultation

Given the biological activity of carbaryl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.48.2. Discussion

As of 6 July 2021, we were unable to match HSR007696 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) carbaryl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p80).

The REI modelling was driven by carbaryl with similar AOELs (0.01mg/kg bw/day *cf* mancozeb, 0.011mg/kg bw/day (EFSA, 2020, p9)), but higher dermal absorption (10% *cf* 1%).

2.48.3. Approved Substance Specific Inputs for REI Modelling

See carbaryl modelling inputs for HSR000441.

Mancozeb:

AOEL = 0.011 mg/kg bw/d, based on a 1-year toxicity study in dogs, with UF = 100 and a 50% absorption factor due to limited oral absorption (EFSA, 2020, p9).

Dermal Absorption (DA) = 1% for active [0.01], based on data with representative formulations of mancozeb (Penncozeb 80 WP, Dithane M-45, Agria Mancozeb 800 WP) (EFSA, 2020, p10).

2.48.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007696	Substance Name	Wettable powder containing 150-200g/kg carbaryl and 150-200g/kg mancozeb		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2700 g a.i./ha; 3 appl'n/year; minimum 7-day interval	2700 g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	73.91	No data	31.7	No data

2.48.5. Notes

2.48.6. Approved Substance Specific References

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance mancozeb*. EFSA Journal 2020;18(12):5755. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.5755>

EPA HSNO Classifications: HSR007696. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/51DAE97C-78AB-4CF8-9472-736A7670A12A>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.48.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.49. HSR007700: Emulsion (oil in water) containing 600g/L diazinon

2.49.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR007700	Emulsion (oil in water) containing 600g/L diazinon	All crops	76 days

The REI is based on the calculated RQ.

HSR007700 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.49.2. Discussion

As of 6 July 2021, we were unable to match HSR007700 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) diazinon is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p373).

2.49.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.49.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007700	Substance Name	Emulsion (oil in water) containing 600g/L diazinon		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.49.5. Notes

2.49.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR007700*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/7177FD81-5819-4FFB-B409-0A14AE485713>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

EPA, 2015. *Decision – Amended: APP201045 – Application for the Reassessment of a Group of Hazardous Substances*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/989dca5648/APP201045-APP201045-Decision-Amended-with-s67As-and-APP202142-2015.07.28.pdf>

2.49.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.50. HSR007761: ArmourCrop Insecticide

2.50.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR007761	ArmourCrop Insecticide	All crops	56 days

Consultation

Given the biological activity of methomyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.50.2. Discussion

As of 6 July 2021, we were unable to match HSR000173 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) methomyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p754).

2.50.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000584.

2.50.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007761	Substance Name	ArmourCrop Insecticide		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		480 g a.i./ha; 1 appl'n/year	480 g a.i./ha; 1 appl'n/year	Default in absence of any data	51.35	No data	29.0	No data

2.50.5. Notes

2.50.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR007761*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/CE496421-E039-4BCC-A84A-AADB87AF1693>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.50.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.51. HSR007769: Nematak 400EC

2.51.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR007769	Nematak 400EC	Carrots, Parsnips, Potatoes	92 days
		All other crops, except: Carrots, Parsnips, Potatoes	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.51.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR007769 was: P007636 – Nematak 400EC.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p612), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.51.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000198.

2.51.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007769	Substance Name	Nematak 400EC		ACVM Register	P007636		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Carrots and Parsnips – Pre-emergence	Root node nematode	20 L/ha in 200-300 L/ha water	8000g a.i./ha; maximum 1 application [C&P8] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5
Potatoes – Pre-emergence	Potato cyst nematode	20 L/ha	8000g a.i./ha; maximum 1 application [Pot11] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5

All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data
<p>^a Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].</p>								

2.51.5. Notes

2.51.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR007769*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/3DEA0C68-A0AD-46D2-9846-B842D69CACCF>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.51.7. Approved Substance ACVM Registered Label

P007636 – Nematak 400EC

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=46275

2.52. HSR007884: Piritek

2.52.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR007884	Piritek	Cucurbits ^a ; Flowering crops – Clovers ^a , Lucerne ^a , Peas ^a , Broad beans ^a , Forage brassicas ^a , Oilseed rape ^a ; Kale ^a , Swedes ^a , Turnips ^a , Cereals ^a ; Beans ^a ; Potatoes ^a ; Vegetable brassicas ^b , Lettuce ^b , Tomatoes ^b	24 hours
		Stonefruit	4 days ^b
		Apples	12 days ^b
		All other crops, except: Cucurbits; Flowering crops – Clovers, Lucerne, Peas, Broad beans, Forage brassicas, Oilseed rape; Kale, Swedes, Turnips, Cereals;	13 days

		Beans; Potatoes; Vegetable brassicas, Lettuce, Tomatoes; Stonefruit; Apples	
<p>^a The REI of 24 hours is recommended because HSR007884 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p> <p>^b The REIs were based on the calculated RQs.</p>			

Consultation

Given the biological activity of pirimicarb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.52.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR007884 was: P007737 – Piritek.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) pirimicarb is included as an insecticide.

The application parameters used in the modelling for this substance were based on the label claims from the ACVM registered product.

2.52.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000703.

2.52.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007884	Substance Name	Piritek		ACVM Register	P007737 – Piritek		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cucurbits	Aphids	250g/ha; 3 appl'n; 10-14 day intervals	125g a.i./ha; 3 appl'n; 7-day interval [Cuc 4&6] ^{a,b}	Vegetables – Reach/Pick	0.61	0.13	0.0	0.0
Flowering crops – Clovers, Lucerne, Peas, Broad beans, Forage	Aphids	250g/ha	125g a.i./ha; 4 appl'n; 7-day interval [F&F 11] ^{a,b}	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
				Pasture – Mowing	0.13	NA	0.0	NA

brassicas, Oilseed rape								
Lucerne, Kale, Swedes, Turnips, Cereals	Aphids	250g/ha	125g a.i./ha; 3 appl'n; 7-day interval [Ara 7] a,b	Vegetables – Reach/Pick	0.61	0.13	0.0	0.0
				Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.24	NA	0.0	NA
Peas, Broad beans, Oilseed rape, Beans	Aphids	250g/ha	125g a.i./ha; 4 appl'n; 7-day interval [B&P 7] a,b	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
Potatoes	Aphids	500g/ha	250g a.i./ha; 2 appl'n; 14-day interval [Pot 10] a,b	Vegetables – Reach/Pick	0.91	0.19	0.0	0.0
Stonefruit	Aphids	25g/100L water; Min. 2000L water/ha	250g a.i./ha; 3 appl'n; 18-day interval [StF 10] a,b	Fruit from trees – Search/Reach/Pick	1.57	0.78	3.3	0.0

Apples	Aphids	50g/100L water; Min. 1kg/ha	500g a.i./ha; 4 appl'n; 7-day interval [Pip 7] ^{a,b}	Fruit from trees – Search/Reach/Pick	4.56	2.28	11.2	6.1
Vegetable brassicas, Lettuce, Tomatoes	Aphids	250g/ha	125g a.i./ha; 3 appl'n; 10-day interval [Bra 18] _{a,b}	Vegetables – Reach/Pick	1.05	0.22	0.4	0.0
All crops: highest application rate found on the approved labels			500g a.i./ha; 4 appl'n; 7-day interval	Default in absence of any data	5.27	No data	12.2	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].								

2.52.5. Notes

2.52.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR007884*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/09621BB0-21D6-4718-8C86-E48924FE5245>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.52.7. Approved Substance ACVM Registered Label

P007737 – Piritek

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=45550

2.53. HSR007894: Namacur CS

2.53.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR007894	Namacur CS	All crops	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.53.2. Discussion

As of 6 July 2021, we were unable to match HSR007894 to any ACVM registered product with an approved label.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p626).

2.53.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000198.

2.53.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR007894	Substance Name	Nemacur CS		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data

2.53.5. Notes

2.53.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR007894*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/8823DE70-C900-4FC9-BBB7-0CECA7F7860E>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.53.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.54. HSR008052: Dovetail

2.54.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR008052	Dovetail	Cereals	6 days
		Forage and Vegetable Brassicas	23 days
		Potatoes	26 days
		All other crops, except: Cereals; Brassicas; Potatoes	13 days
<p>The REI modelling was driven by lambda-cyhalothrin with the lower AOEL.</p> <p>The REIs were based on the calculated RQs.</p> <p>HSR008052 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of lambda-cyhalothrin and pirimicarb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.54.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR008052 was: P007941 – Dovetail.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) pirimicarb is included as an insecticide.

The application parameters used in the modelling for this substance were based on the label claims from the ACVM registered product. For the “All other crops” scenario, potential exposures were modelled on the highest application rate found on the approved labels of similar substances.

The original approval, HSR08091, stipulated a maximum application rate to protect the environment:

The maximum application rate for Dovetail shall be 1.5 L/ha (8.955 g/ha lambda-cyhalothrin and 156.45 g/ha pirimicarb), with a maximum application frequency of 4 applications per season and a minimum application interval of 10 days. (ERMA, 2009, p7).

2.54.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000703.

lambda-Cyhalothrin:

AOEL = 0.00063mg/kg bw/d, based on a multigeneration study in rats, with a UF of 200 and corrected for 25% oral absorption modelled here (EFSA, 2014, p10). ERMA used 0.0006mg/kg bw/d (ERMA, 2010, p38).

Dermal absorption (DA) = 25% (0.25), based on a range of emulsifiable granule (EG), emulsifiable concentrate (EC) and capsule suspension (CS) formulations, and modelled here (EFSA, 2014, p10). ERMA used 1% for lambda-cyhalothrin in Ampligo, an encapsulated suspension flowable concentrate, based on US EPA information on Warrior and Karate products that are both CS formulations (ERMA, 2010, p38). The EFSA data is more relevant to Dovetail, an EC formulation.

2.54.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR008052	Substance Name	Dovetail			ACVM Register	P007941 – Dovetail	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cereals	Aphids	1L in 200-300L water; 2 appl'n	100g pirimicarb/ha; 4 appl'n; 7-day interval [Ara 14] <small>a,c</small>	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.20	NA	0.0	NA
			5g lambda-cyhalothrin/ha; 4		1.52	NA	6.0	NA

			appl'n; 7-day interval					
Forage and Vegetable Brassicas	Aphids	1-1.25L in 400-600L water; 14-day intervals	125g pirimicarb/ha; 4 appl'n; 7-day interval [Bra 5] ^{a,b}	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
			6.25g lambda-cyhalothrin/ha; 4 appl'n; 7-day interval		4.74	0.99	22.4	0.0
Potatoes	Aphids	1.5L in 200-400L water; 14-day intervals	150g pirimicarb/ha; 4 appl'n; 7-day interval [Pot 2] ^{a,c}	Vegetables – Reach/Pick	0.76	0.19	0.0	0.0
			7.5g lambda-cyhalothrin/ha; 4 appl'n; 7-day interval		5.68	1.18	25.1	2.4

All crops: highest application rate found on the approved labels			500g a.i./ha; 4 appl'n; 7-day interval	Default in absence of any data	5.27	No data	12.2	No data
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.54.5. Notes

2.54.6. Approved Substance Specific References

EFSA, 2014. *Conclusion on the peer review of the pesticide risk assessment of the active substance lambda-cyhalothrin*. EFSA Journal;12(5):3677.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2014.3677>

EPA HSNO Classifications: HSR008052. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/7C1CB62D-83E8-433E-B19A-11B64F0F8298>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

ERMA, 2009. *HSR06012 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/HSR08091/aa038e5bf1/HSR08091.doc>

ERMA, 2010. *ERMA200435 – Evaluation and Review Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200435/a65b41006e/ERMA200435-ERMA200435-EnR.pdf>

2.54.7. Approved Substance ACVM Registered Label

P007941 – Dovetail

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-

[2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=51939](#)

2.55. HSR100018: Rampage

2.55.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100018	Rampage	Avocado; Pipfruit, Stonefruit	48 hours
		All other crops, except: Avocado; Brassica and Forage crops; Cereals; Cereals and Ryegrass, Grapes (except Table Grapes); Kiwifruit; Lucerne; Maize; Onions; Pasture; Pipfruit, Stonefruit; Squash	8 days

Consultation

Given the biological activity of chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.55.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100018 was: P008048 – Rampage Encaps.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p28) chlorpyrifos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p266), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.55.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000224.

2.55.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100018	Substance Name	Rampage		ACVM Register	P008048 – Rampage Encaps		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Lucerne	Aphids	560-880mL/ha	-					
	Sitona weevil	1.2-1.6L/ha	400g a.i./ha	Pasture – Mowing	0.07	NA	0.0	NA
Maize	Army caterpillar	1.0L/ha	-					
	Corn Earworm	1.0L/ha	-					

	Cutworm	1.1L/ha	300g a.i./ha; 4 appl'n; 14-day interval [Mai 3] a,d	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.10	NA	0.0	NA
Pasture	Army Caterpillar	800mL/ha	-					
	Lucerne Flea, Clover Flea	400mL/ha	-					
	Porina Caterpillar	2.4-3.2L/ha	800g a.i./ha [Pas 7&38] a,c	Pasture – Mowing	0.14	NA	0.0	NA
	Tasmanian Grass Grub	2.4-2.9L/ha	-					
	Clover root weevil	1.0L/ha	-					
	Argentine stem weevil	2.4L/ha	-					
Cereals	Cereal, Grain and Rose Aphid	560-800mL/ha	200g a.i./ha; 1 appl'n [Ara 9&23] a,c	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.07	NA	0.0	NA

Cereals and Ryegrass	Argentine Stem Weevil	2.4L/ha	600g a.i./ha; 1 appl'n [Ara 10&24] ^{a,c}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.21	NA	0.0	NA
Brassica and Forage crops	Aphids	560-800mL/ha	-					
	Nysius	2.4L/ha	600g a.i./ha; 1 appl'n [F&F 7&22] ^{a,c}	Vegetables – Reach/Pick	0.51	0.11	0.0	0.0
	Springtails	400mL/ha	-					
Onions	Onion Thrips	2.0L/ha; 3-4 appl'n; 5-14 day intervals	500g a.i./ha; 8 appl'n; 5-day interval [Oni 5] ^{a,e}	Vegetables – Reach/Pick	0.48	0.10	0.0	0.0
Winter Squash	Aphids, Caterpillars	1.0L/ha	250g a.i./ha; 2 appl'n; 7-day intervals [Cuc 3] ^{a,c}	Vegetables – Reach/Pick	0.22	0.05	0.0	0.0
Avocado	Leaf roller	100-150mL/100L of water or 3.2L/ha (aerial)	1125g a.i./ha; 5 appl'n; 7-day interval [Avo 13&17] ^{a,b}	Fruit from trees – Search/Reach/Pick	1.82	0.91	1.4	0.0

Wine Grapes	Leafroller, Mealy bug, Aphids, Scale Crawlers, Thrips, Grape vine weevil	50-75mL/ha in 100-200L water	500g a.i./ha; 4 appl'n; 14-day interval [Gra 1] _{a,c}	Berries – Reach/Pick	0.51	0.13	0.0	0.0
Kiwifruit	Greedy Scale, Leafroller, Passion Vine Hopper	100mL/100L; not less than 2.0L/ha	500g a.i./ha; 2 appl'n; 21-day interval [Kwi 2] _{a,d}	Berries – Reach/Pick	0.51	0.13	0.0	0.0
Pipfruit, Stonefruit [pre- flowering]	Mealy bug, Scale Crawlers, Woolly Aphid, Leafrollers, Brown Beetle	160mL/100L of water; 4.8L/ha on mature trees; 2 appl'n; 10-12 day interval	1200g a.i./ha; 4 appl'n; 14-day interval	Fruit from trees – Search/Reach/Pick	1.86	0.93	1.4	0.0
Ornamentals	Caterpillars, Aphids, Leafrollers, Mealy bugs, Scale Crawlers,	100mL/100L; not less than 2.0L/ha	500g a.i./ha	Ornamentals – Cut/Sort/Bundle/Carry	0.86	0.24	0.0	0.0

	Bronze beetle, Brown beetle							
Industrial pests	Spiders , Ants, Slaters	240mL in 10L of water	-					
All crops: maximum stipulated application rate in APP201045		1500 g a.i./ha	1500 g a.i./ha	Default in absence of any data	2.67	No data	7.8	No data
<p>^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>;</p> <p>^b Industry source: Critical (rate>label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^d Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];</p> <p>^e Industry source: Critical (rate<label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].</p>								

2.55.5. Notes

Only the highest use rate was modelled for each crop.

2.55.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR100018*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/D7A25154-D451-474A-8EBC-788B388D2406>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.55.7. Approved Substance ACVM Registered Label

P008048 - Rampage Encaps

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=33589

2.56. HSR100129: Danadim

2.56.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100129	Danadim	Lucerne, Pasture	24 hours ^a
		Cereals, Barley, Oats, Wheat	24 hours ^b
		Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Potatoes, Fodder Beet, Sugar Beet, Red Beet, Kale, Rape, Turnips, Swedes	48 hours ^b
		Strawberries, Blackcurrants	3 days ^b
		Apples, Pears	15 days ^b
		All other crops, except: Cereals, Barley, Oats, Wheat, Lucerne, Pasture, Broccoli, Brussels Sprouts, Cabbage, Cauliflower,	49 days ^b

		Potatoes, Fodder Beet, Sugar Beet, Red Beet, Kale, Rape, Turnips, Swedes, Strawberries, Blackcurrants, Apples, Pears	
<p>^a HSR100129 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p> <p>^b The REIs were based on the calculated RQs.</p>			

Consultation

Given the biological activity of dimethoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.56.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100129 were: P002577 – ROGOR E and P008040 – Danadim Progress.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) dimethoate is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p554), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.56.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000188.

Foliar DT₅₀ and DFR values see table below:

Foliar DT ₅₀ and DFR values for dimethoate		
Crops	Foliar DT ₅₀ (days)	DFR
Cereals; Barley; Oats; Wheat; Lucerne; Pasture; Vegetables; Broccoli; Brussels Sprouts; Cabbage; Cauliflower; Carrots; Peas; Potatoes; Fodder crops	0.85	1.28
Berryfruit; Strawberries; Blackcurrants	0.86	1.47
Apples; Pear; Plum	4.16	1.61
(EPA, 2012, compiled data)		

2.56.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100129	Substance Name	Danadim		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Berryfruit Strawberries ^d	Strawberry aphid	80 mL / 100 L	700g a.i./ha; 1 application [Ber7] ^{a,b}	Berries – Reach/Pick	7.06	1.76	2.4	0.7
Black Currants ^d	Aphids							
Cereals, Barley, Oats, Wheat	Cereal aphid, Grain aphid	700 mL/ha in 100 - 200 L water	400g a.i./ha; 3 applications; 21-day interval [Ara1] ^{a,e}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	1.17	NA	0.2	NA

Lucerne	Blue-green lucerne aphid	300 - 500 mL/ha in 300 - 600 L water	400g a.i./ha; 1 application [F&F8] ^{a,b,i}	Mowing	0.59	NA	0.0	NA
Orchards Apples, Pears, Plums	Leaf hoppers, Pear and Cherry sawfly larvae	50 mL/ 100 L	650g a.i./ha; 4 applications; 14- day interval [Pip4; StF7] ^{a,b,f}	Fruit (from trees) – Search/Reach/Pick	11.92	5.96	14.9	10.7
	Aphids, Leaf miners, Mealy bug, Scale (Crawler Stage), Thrips, Whitefly	80 mL/ 100 L	-					
Pasture	Clover flea (Lucerne flea)	500 - 750 mL/ha in 300 - 500 L water; Respray at 6-8 week interval if reinvansion occurs	300g a.i./ha; 2 applications; 42- day interval [Pas68] ^{a,b}	Mowing	0.44	NA	0.0	NA

Vegetables Broccoli, Brussels Sprouts, Cabbage, Cauliflower	Cabbage aphid	800 mL/ha in 500 - 1000 L water	325g a.i./ha; 4 applications; 14- day interval [C&P3] ^{a,b,g}	Vegetables – Reach/Pick	2.38	0.49	1.1	0.0
Carrots	Carrot aphid							
Peas, Potatoes	Aphids							
Potatoes			400g a.i./ha; 3 applications; 21- day interval [Pot1] ^{a,h}	Vegetables – Reach/Pick	2.93	0.61	1.3	0.0
Fodder Crops e.g., Fodder Beet, Sugar Beet, Red Beet, Kale, Rape, Turnips, Swedes	Aphids, Springtails	800 mL - 1 L/ha	400g a.i./ha; 1 application [F&F8] ^{a,b,i}	Vegetables – Reach/Pick	2.93	0.61	1.3	0.0
All crops: maximum stipulated		400 g a.i./ha; 3 appl'n/year; 7- day interval	400 g a.i./ha; 3 appl'n/year; 7- day interval	Default in absence of any data	28.45	No data	48.3	No data

application rate in APP201045								
<p>^a Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>;</p> <p>^b Label (non-critical) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>];</p> <p>^c Industry source: Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>];</p> <p>^d Label claim not modelled in relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>; Strawberry modelled in EPA, 2012. <i>APP201045</i> at 325g a.i./ha, 1 application;</p> <p>^e Industry source: Critical (rate>label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>];</p> <p>^f Only one claim modelled in EPA, 2012. <i>APP201045: Summary and Analysis – Stonefruit and Pipfruit Reports</i> with the same application rates;</p> <p>^g Only carrot label claim modelled in EPA, 2012. <i>APP201045: Summary and Analysis</i>;</p> <p>^h Industry source: Critical (off label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>];</p> <p>ⁱ Only one claim modelled in EPA, 2012. <i>APP201045: Summary and Analysis – Fodder and forage</i>.</p>								

2.56.5. Notes

2.56.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR100129*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/C54B9E9B-14B5-42E3-AAFF-0E582EA888BC>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.56.7. Approved Substance ACVM Registered Label

P002577 – ROGOR E

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=43877

P008040 – Danadim Progress

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=52460

2.57. HSR100282: Canyon

2.57.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100282	Canyon	Carrots, Parsnips, Potatoes	92 days
		All other crops, except: Carrots, Parsnips, Potatoes	100 days

Consultation

Given the biological activity of fenamiphos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Is it valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses as the substance is exclusively used in pre-emergent crop scenarios?

2.57.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100282 was: P008091 – Canyon.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) fenamiphos is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, p643), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

2.57.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000198.

2.57.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100282	Substance Name	Canyon		ACVM Register	P008091 – Canyon		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Carrots and Parsnips – Pre-emergence	Root node nematode	20 L/ha in 200-300 L/ha water	8000g a.i./ha; maximum 1 application [C&P8] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5
Potatoes – Pre-emergence	Potato cyst nematode	20 L/ha	8000g a.i./ha; maximum 1 application [Pot11] ^{a,b}	Vegetables – Reach/Pick	4285.71	891.43	91.7	74.5

All crops: maximum stipulated application rate in APP201045		8000 g a.i./ha; 1 appl'n/year	8000 g a.i./ha; 1 appl'n/year	Default in absence of any data	8914.29	No data	99.7	No data
<p>^a Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].</p>								

2.57.5. Notes

2.57.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR100282*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/2FCC5C1F-0378-4965-9271-AAAE36B4B061>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.57.7. Approved Substance ACVM Registered Label

P008091 – Canyon

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=43334

2.58. HSR100571: Sharpen (700g saflufenacil/kg WDG)

2.58.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100571	Sharpen	Apples; Pears (weed control under trees)	None
		Pre-plant burn down; General (non- agricultural areas)	None
		Maize, Sweetcorn (Pre- emergence)	None
		All other crops except: Apples; Pears; Maize; Sweetcorn	None

Consultation

Given the herbicidal activity of saflufenacil:

- a) Is it valid to assume that dermal exposure of re-entry workers is unlikely for existing label claims; and
- b) Is it also valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses? In which case, the recommended REI for “All other crops” could be changed to “None”.

2.58.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100571 was: P008391 – Sharpen.

In the HSNO approval ERMA200799 – *Decision* (ERMA, 2011a, p1) *Purpose of the application* it stated that Sharpen was a post or pre-emergence herbicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

In the context of re-entry worker risk assessment and current and future “off label” uses, the US EPA noted that:

“Most of the proposed uses for saflufenacil are soil-directed preplant or preemergent uses where no crop foliage is present. The proposed labels indicate that crop injury will result if the products are applied postemergent (over the top) to any crop. Currently, HED has no transfer coefficients or other data to assess postapplication dermal exposures to soil by occupational workers. In general, such exposures are considered to be negligible. Therefore, for the proposed soil-directed uses, postapplication dermal exposures and risks to occupational workers were not assessed. For the use on sunflowers as a desiccant, postapplication exposure is expected to be minimal since harvesting of sunflowers is typically done by machine.” (US EPA, 2009, p19).

2.58.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default

i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.015	Substance specific
DA = dermal absorption (expressed as a proportion)	0.81	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Saflufenacil:

AOEL = 0.015 mg/kg bw/d, based on a 2-generation toxicity study in rats, with UF = 100 and a 70% correction for limited oral absorption (ERMA, 2011a, pp161-166).

Dermal Absorption (DA) = 81% for active [0.81] (ERMA, 2011a, p166).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100571 – Additional controls: indicated a maximum application rate of 105g saflufenacil/ha; 1 application/year; or, 17.5g saflufenacil/ha; 4 application/year; 21-day interval (EPA, 2021, p3). The single application of 105g saflufenacil/ha gave the highest annual rate and was used to model the “All other crops” scenario.

The Transfer Coefficient for “Default in absence of any data” (5,200 cm^2/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.58.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100571	Substance Name	Sharpen		ACVM Register	P008391		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples; Pears	Weed control under trees	25 g/ha; 3 appl'n/season; 21-day intervals	17.5g a.i./ha; 3 appl'n/season; 21-day intervals	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a
Pre-plant burn down; General (non-agricultural areas)		25 g/ha; 2 appl'n/season; 21-day intervals	17.5g a.i./ha; 2 appl'n/season; 21-day intervals	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a

Maize, Sweetcorn [Pre-emergence]	Weed control	150 g/ha; 1 appl'n/year	105 g a.i./ha; 1 appl'n/year	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a
All other crops: maximum stipulated application rate in HSR100571		105 g a.i./ha; 1 appl'n/year	105 g a.i./ha; 1 appl'n/year	Default in absence of any data	10.11	No data	33.4	No data
^a Not Applicable: Dermal exposure was considered unlikely for crop pre-emergence herbicide and weed clearance under established crop trees application.								

2.58.5. Notes

[ERMA (2011a, p169) used TC = 2500 cm²/h, as a “conservative assumption given the proposed use pattern of Sharpen”.]

2.58.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EPA, 2021. *Approval for reissue: HSR100571*.

https://www.epa.govt.nz/assets/RecordsAPI/Sharpen_HSR100571.pdf

ERMA, 2011. *ERMA200799 – Application Form: Sharpen*

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200799/8de051484f/ERMA200799-ERMA200799-Application-form.pdf>

ERMA, 2011a. *ERMA200799 – Decision: Sharpen*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200799/b712181b62/ERMA200799-ERMA200799-Decision.pdf>

US EPA, 2009. *Pesticide Fact Sheet: Saflufenacil*.

https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-118203_01-Aug-09.pdf

2.58.7. Approved Substance ACVM Registered Label

P008391 – Sharpen:

[https://eatsafe.nzfsa.govt.nz/web/public/acvm-](https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-)

[register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-](https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-)

2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=43508

2.59. HSR100588: Actigard (500g acibenzolar-S-methyl/L WDG)

2.59.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100588	Actigard	Kiwifruit	48 hours
		All other crops except: Kiwifruit	10 days
<p>The REIs for Kiwifruit and All other crops were based on the RQ calculations.</p> <p>HSR100588 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of acibenzolar-S-methyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.59.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR1010588 was: P008487 – Actigard.

In the HSNO approval APP201071– *Decision* (EPA, 2011a, p1) *Purpose of the application* it stated that Actigard was a plant activator to aid in the control of Psa-V (the virulent form of *Pseudomonas syringae* pv. *actinidiae*) on kiwifruit.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

In the US, acibenzolar-S-methyl is registered for use on other crops in addition to kiwifruit, for example: to control downy mildew on leafy vegetables (including Brassica (cole) leafy vegetables); bacterial spot and bacterial speck on tomatoes; and, blue mold on tobacco (US EPA, 2000).

2.59.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
l = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default

AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.1	Substance specific
DA = dermal absorption (expressed as a proportion)	0.81	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Acibenzolar-S-methyl:

AOEL = 0.1 mg/kg bw/d (EPA (2011b, pp37-39) citing EFSA (2001)).

Dermal Absorption (DA) = 81% for spray dilution [0.81] (EPA (2011b, p39) citing EFSA (2001)).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100709 – Additional controls: indicated a maximum application rate of 100g acibenzolar-S-methyl/ha; 4 applications/year; minimum interval 21 days (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.59.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100588	Substance Name	Actigard		ACVM Register	P008487		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Kiwifruit	Psa (<i>Pseudomonas syringae</i> pv. <i>actinidiae</i>)	Do not exceed 200g Actigard/ha; maximum 4 sprays/year; minimum 21-day interval	100 g a.i./ha; 4 appl'n/year; 21-day interval	Berries – reach/pick	1.08	0.27	1.2	0.0

All other crops: maximum stipulated application rate in HSR100588		100 g a.i./ha; 4 appl'n/year; minimum 21- day interval	100 g a.i./ha; 4 appl'n/year; 21- day interval	Default in absence of any data	1.88	No data	9.1	No data

2.59.5. Notes

EPA (2011) states: *Staff did not attempt to model exposure to application to the base of each vine using a backpack sprayer as this would require knowledge of plant density per hectare. The assessment of the foliar application using an airblast sprayer was considered to be “worst” case in comparison with the back pack sprayer, and that the controls required by the other method would be address the exposure risks.*

2.59.6. Approved Substance Specific References

EFSA, 2014. *Conclusion on the peer review of the pesticide risk assessment of the active substance acibenzolar-S-methyl*. EFSA Journal 2014;12(8):3691.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2014.3691>

EPA HSNO Classifications: *Actigard*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/84EB5DC0-A383-4740-BF1C-48BA0858FD38>

EPA, 2011. *APP201071 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201071/7323411b1e/APP201071-APP201071-Application-Form.pdf>

EPA, 2011a. *APP201071 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201071/6760eb335c/APP201071-APP201071-Decision.pdf>

EPA, 2011b. *HSR100588 Science Memo*.

EPA, 2021. *Approval for reissue: HSR100588*.

https://www.epa.govt.nz/assets/RecordsAPI/Actigard_HSR100588.pdf

US EPA, 2000. *Pesticide Fact Sheet: Acibenzolar-S-methyl*.

https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-061402_11-Aug-00.pdf

2.59.7. Approved Substance ACVM Registered Label

P008487 – Actigard;

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=50091

2.60. HSR100598: Goltix Uno (350g metamitron/L and 150g ethofumesate/L SC)

2.60.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100598	Goltix Uno Herbicide	Beets	29 days
		All other crops except: Beets	40 days
The REI modelling was driven by metamitron with the lower AOEL and higher application rate.			

Consultation

Given the biological activities of metamitron and ethofumesate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.60.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100598 was: P008475 – Goltix Uno.

In the HSNO approval APP201004 (EPA, 2011) *Application purpose* it stated that Goltix Uno was an herbicide. The active ingredient metamitron is purposed as an herbicide or as a plant growth regulator in various Approvals.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.60.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling metamitron		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.036	Substance specific

DA = dermal absorption (expressed as a proportion)	0.20	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Metamitron:

AOEL = 0.036 mg/kg bw/d (EPA (2011a, p29) citing EFSA (2008)).

Dermal Absorption (DA) = 20% for active [0.20] (EPA (2011a, p27) citing EFSA (2008)).

Ethofumesate:

AOEL = 2.5 mg/kg bw/d (EPA (2011a, p29) citing EFSA (2008)).

Dermal Absorption (DA) = 10% for active [0.10] (EPA (2011a, p27)).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). APP204060 Modified Approval for HSR100598: indicated a maximum application rate of 308g ethofumesate/ha and 714g metamitron/ha; 3 applications/year; 5-day interval (EPA, 2021a, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.60.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100598	Substance Name	Goltix Uno Herbicide			ACVM Register	P008475	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Beet: Red, Fodder, Sugar, Mangolds	Broadleaf weeds	2 L/ha; 3 appl'n/year; 5-day interval	700g metamitron /ha; 3 appl'n/year; 5-day interval	Vegetables – reach/pick	7.36	1.53	28.8	6.1
			300g ethofumesate /ha; 3		0.02	0.0	0.00	0.0

			appl'n/year; 5-day interval					
All other crops: maximum stipulated application rate in APP204060 – HPC4B		714g metamitron/ha; 3 applications/year; 5-day interval	714g metamitron/ha; 3 applications/year; 5-day interval	Default in absence of any data	15.61	No data	39.6	No data
		308g ethofumesate/ha; 3 applications/year; 5-day interval	308g ethofumesate/ha; 3 applications/year; 5-day interval		0.05	No data	0.0	No data

2.60.5. Notes

[No Application documents in <https://www.epa.govt.nz/database-search/hsno-application-register/view/APP201004> as of 11Aug2021].

EPA has used different dermal absorption values for met amitron in different approvals:

For HSR100598 – Goltix Uno Herbicide: 20% (EPA, 2011a), based on EFSA assessment of data for met amitron from a “triple-pack” analysis (EFSA, 2008, p14) [does not show impact of formulation, but more credible than default values].

For HSR101178 – Brevis: 30% (EPA, ?), based on EPA evaluation of reference substance Meteor (700g met amitron/kg WDG; EPA, 2019), which used a default value for dilute spray [30% default presumed from Aggarwal *et al.*, 2015 cited in EPA, 2020].

For HSR101186 – Metafol 700 SC: 1.86% (EPA, 2016a), based on submitted 2010 *in vitro* data for formulation Metafol 700 SC [no *in vivo* data for a “triple-pack” analysis – in the absence of *in vivo* data, this value is not robust].

For HSR101235 – Beetron PM: 75% (EPA, 2017a), based on EFSA default values for spray dilutions containing less than 5% active ingredient (EFSA, 2012) [these default values have been revised by EFSA (2017) to 70% in these circumstances].

EPA has used met amitron specific DFR values for apple leaves in HSR101178 (Brevis).

[HSR101023 – Meteor (700g met amitron/kg) used as a thinning agent for apples has an application rate of 518g met amitron/ha and 2 applications/year with a 5-day interval, and the EPA modelled the REI using a crop specific DFR value (0.89 $\mu\text{g}/\text{cm}^2/\text{kg ai}/\text{ha}$); foliar DT_{50} (3 days); and, a TC value for Fruit from trees – Search/Reach/Pick (4500 cm^2/h without gloves). These differences in input parameter values would determine the different REI values calculated in each assessment.]

2.60.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2008. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance metamitron*. EFSA Scientific Report (2008) 185, 1-95.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2008.185r>

EFSA, 2012. *Guidance on Dermal Absorption*. EFSA Panel on Plant Protection Products and their Residues (PPR). EFSA Journal 2012;10(4):2665

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2012.2665>

EFSA, 2016. *Peer review of the pesticide risk assessment of the active substance ethofumesate*. EFSA Journal 2016;14(1):4374. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2016.4374>

EPA HSNO Classifications: *Goltix Uno Herbicide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/266B9F7B-AB6E-4746-9437-E4492A9997BB>

EPA, 2011. *APP201004* No documents <https://www.epa.govt.nz/database-search/hsno-application-register/view/APP201004>

EPA, 2011a. *APP201004 Goltix Uno Herbicide: Science Memo*.

EPA, 2021. *Approval for reissue: HSR100598*.

https://www.epa.govt.nz/assets/RecordsAPI/Goltix_Uno_Herbicide_HSR100598.pdf

EPA, 2021a. *Modified Approval - Goltix Uno (HSR100598)*. https://epa.govt.nz/assets/FileAPI/hsno-ar/APP204060/Modified_Approval_Goltix_Uno_Herbicide_HSR100598.pdf

2.60.7. Approved Substance ACVM Registered Label

P008475 – Goltix Uno:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53787

2.61. HSR100602: Attack

2.61.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
		Glasshouse Tomatoes and Cucurbits; Forage brassicas; Vegetable brassicas; Fodder beet	12 days
		Flowers and ornamentals; Grapes	22 days
		Citrus; Persimmons; Avocados	34 days
		All other crops, except: Glasshouse Tomatoes and Cucurbits; Forage brassicas; Vegetable brassicas; Fodder beet; Flowers and ornamentals; Grapes; Citrus; Persimmons; Avocados	36 days

The REI modelling was driven by pirimiphos-methyl with the lower AOEL, and higher application rate.

The REIs were based on the calculated RQs.

HSR100602 is classified as a respiratory (6.5A; Resp Sens. 1) and skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1):

the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activities of pirimiphos-methyl and permethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.61.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100602 was: P002912 – Attack.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) pirimiphos-methyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for this approval APP201045 – *Controls Appendix* (EPA, 2013, pp880-881) , and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

The REI modelling was driven by pirimiphos-methyl with a lower AOEL (0.02mg/kg bw/d (EPA, 2012, p140 citing EFSA, 2011) *cf* permethrin, 0.05mg/kg bw/day (IPCS, 1990)), and higher formulated concentration.

2.61.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000187.

2.61.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100602	Substance Name	Attack			ACVM Register	P002912 – Attack	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Avocados	Leafroller, Mealy bug, Greedy scale	100mL/100L water; 4-6 week intervals	1425g pirimiphos-methyl/ha; 4 appl'n; 7-day interval [Avo 9&16] ^{a,b}	Fruit from trees – Search/Reach/Pick	21.48	10.74	33.6	26.0

Citrus	Leafroller, Mealy bug, Scale crawler, Aphids	100mL/100L water; 4-6 week intervals	1425g pirimiphos- methyl/ha; 4 appl'n; 28-day interval [Cit 5] ^{a,c}	Fruit from trees – Search/Reach/Pick	11.92	5.96	27.2	19.6
Flowers and ornamentals	Mealy bug, Whitefly, Aphids, Caterpillars	1L/ha; 3-4 week intervals	600g pirimiphos- methyl/ha; 3 appl'n; 21-day interval [Orn 2] _{a,d}	Ornamentals – Cut/Sort/Bundle/Carry	6.01	1.68	19.7	5.7
Glasshouse Tomatoes and Cucurbits	Leafroller, Mealy bug	100mL/100L water; 2-3 week intervals	475g pirimiphos- methyl/ha; 4 appl'n; 21-day interval [GHC 7] _{a,b}	Vegetables – Reach/Pick	2.39	0.50	9.5	0.0
Grapes	Leafroller, Mealy bug	Min. 1.5L/ha	712.5g pirimiphos- methyl/ha; 4 appl'n; 7-day interval	Berries – Reach/Pick	7.16	1.79	21.6	6.4

Persimmons	Leafroller, Mealy bug, Greedy scale, Latania scale	Min. 2L/ha; 2-3 week intervals	1425g pirimiphos- methyl/ha; 4 appl'n; 28-day interval [Per 4] ^{a,c}	Fruit from trees – Search/Reach/Pick	11.92	5.96	27.2	19.6
Forage brassicas	Springtails	100-200mL/ha; 2-3 week intervals	-					
	White butterfly, Leaf miner, Nysius, Argentine stem weevil	500mL-1L/ha; 2- 3 week intervals	-					
	Diamondback moth, Aphids	750mL-1L/ha; 2- 3 week intervals	475g pirimiphos- methyl/ha; 4 appl'n; 14-day interval [F&F 13] ^{a,d}	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0
Vegetable brassicas	White butterfly, Diamondback	1L/ha; 2-3 week intervals	475g pirimiphos- methyl/ha; 4	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0

	moth, Caterpillars, Aphids, Leaf miner, Nysius		appl'n; 14-day interval [Bra 6] ^{a,c}					
Fodder beet	Springtails	100-200mL/ha	-					
	Leaf miner, Nysius, Aphids, Argentine stem weevil	500mL-1L/ha	475g pirimiphos- methyl/ha; 4 appl'n; 14-day interval [F&F 13] _{a,d}	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0
All crops: maximum stipulated application rate in APP201045		1425g pirimiphos- methyl/ha; 4 appl'n/year	1425g pirimiphos- methyl/ha; 4 appl'n/year; 7- day interval	Default in absence of any data	24.83	No data	35.2	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ; ^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^c Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^d Label: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>];								

2.61.5. Notes

2.61.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR100602*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/19E7F42D-37DC-407F-AC6D-EDAA31FC5816>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

IPCS, 1990. *Environmental health criteria: 94 – Permethrin*. World Health Organization, Geneva. <https://incem.org/documents/ehc/ehc/ehc94.htm>

2.61.7. Approved Substance ACVM Registered Label

P002912 – Attack

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55018

2.62. HSR100609: XF-92037 (750g fenbuconazole/kg WSP)

2.62.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100609	XF-92037	All crops	31 days

Consultation

Given the biological activities of fenbuconazole:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.62.2. Discussion

As of 6 July 2021, we were unable to match HSR100609 to any ACVM registered product with an approved label.

The HSNO approval ERMA200870 – *Application* (EPA, 2011, p20) stated in *Benefits* that XF-92037 was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

2.62.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.02	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Fenbuconazole:

AOEL = 0.02 mg/kg bw/d (EPA (2011a, p39) based on EFSA).

Dermal Absorption (DA) = 30% for active [0.30] (ERMA (2011a, p39)).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100609 – Additional controls: indicated a maximum application rate for cereals of 113g XF-92037/ha (85g fenbuconazole/ha); 2 application/year; 11-day interval; and, for fruit crops of 113g XF-92037/ha (85g fenbuconazole/ha); 4 application/year; 1-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.62.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100609	Substance Name	XF-92037		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in HSR100609		113 g/ha (85g fenbuconazole/ha); 4 application/year; 1-day interval	85g fenbuconazole/ha; 4 application/year; 1-day interval	Default in absence of any data	8.22	No data	30.4	No data

2.62.5. Notes

2.62.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2010. *Conclusion on the peer review of the pesticide risk assessment of the active substance fenbuconazole*. EFSA Journal 2010;8(4),1558.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2010.1558>

EPA HSNO Classifications: *XF-92037*.

https://www.epa.govt.nz/assets/Uploads/Documents/Hazardous-Substances/GHS2/GHS_Classifications_and_Fates_30_April_2021.xlsx

EPA, 2021. *Approval for reissue: HSR100609*. https://www.epa.govt.nz/assets/RecordsAPI/XF-92037_HSR100609.pdf

ERMA, 2011. *ERMA200870 – Application: XF-92037*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200870/427e151277/ERMA200870-ERMA200870-Application.pdf>

ERMA, 2011a. *ERMA200870 – Science Memo*.

2.62.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.63. HSR100664: Doxstar (225g indoxacarb/L SL)

2.63.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100664	Doxstar	Cabbage, Cauliflower, Broccoli, Brussels sprouts, and Head lettuce (outdoor); Grapes; Kiwifruit	39 days
		Apples, Pears	45 days
		All crops except: Cabbage, Cauliflower, Broccoli, Brussels sprouts, and Head lettuce (outdoor); Grapes; Kiwifruit; Apples, Pears	52 days
<p>The REIs were based on the calculated RQs.</p> <p>HSR100664 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of indoxacarb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.63.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100664 was: P008476 – Imperio.

The HSNO approval APP201187 – *Science Memo* (EPA, 2012, p2) stated that Doxstar was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.63.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.004	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Indoxacarb:

AOEL = 0.004 mg/kg bw/d, based on a developmental toxicity study in rats with UF = 100, with a 60% correction for limited oral absorption (EFSA, 2005 cited in EPA, 2012, p6).

Dermal Absorption (DA) = 30% for active [0.30] (EPA, 2012, p7).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100664 – Additional controls: indicated a maximum application rate of 120g indoxacarb/ha; 4 applications/season; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.63.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100664	Substance Name	Doxstar		ACVM Register	P008476		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cabbage, Cauliflower, Broccoli, Brussels sprouts	Diamond back moth, Cabbage white butterfly	330 mL/ha; 7-14 day intervals; not more than 4 appl'n per season	75g indoxacarb /ha; 4 appl'n/year; 7-day interval	Vegetables – Reach/Pick	10.74	2.23	34.3	11.6
Kiwifruit [fruitlet less than 10mm long]	Leaf roller caterpillars	Minimum of 330 mL/ha	120g indoxacarb /ha; 1 appl'n/year	Berries – Reach/Pick	14.60	3.65	38.7	18.7

Head lettuce (outdoor)	Soybean looper	330 mL/ha; 7-14 day intervals; not more than 4 appl'n per season	75g indoxacarb /ha; 4 appl'n/year; 7-day interval	Vegetables – Reach/Pick	10.74	2.23	34.3	11.6
Apples, Pears	Codling moth, Leafrollers	Minimum of 530 mL/ha; 14 day intervals; not more than 4 appl'n per season	120g indoxacarb /ha; 4 appl'n/year; 14-day interval	Fruit (from trees) – Search/Reach/Pick	21.90	10.95	44.5	34.5
Grapes [up to pre-bunch closure]	Leafrollers	14 day intervals; maximum 2 appl'n per season	120g indoxacarb /ha; 2 appl'n/year; 14-day interval	Berries – Reach/Pick	12.76	3.19	36.7	16.7
All other crops: maximum stipulated application rate in HSR100664		120g indoxacarb /ha; 4 appl'n/year; 7-day interval	120g indoxacarb /ha; 4 appl'n/year; 7-day interval	Default in absence of any data	35.75	No data	51.6	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.63.5. Notes

[No Application documents on website, 14Aug2021.]

2.63.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2018. *Peer review of the pesticide risk assessment of the active substance indoxacarb*. EFSA Journal 2018;16(1):5140. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5140>

EPA HSNO Classifications: *Doxstar*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/13976876-8525-48BC-BCB0-5445C2BD8B93>

EPA, 2012. *APP201187 – Doxstar: Science Memo*.

EPA, 2021. *Approval for reissue: HSR100664*.

https://www.epa.govt.nz/assets/RecordsAPI/Doxstar_HSR100664.pdf

2.63.7. Approved Substance ACVM Registered Label

P008476 – Imperio 225g/L SC:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=33750

2.64. HSR100709: Zampro (300g ametoctradin/L and 225g dimethomorph/L SC)

2.64.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100709	Zampro	Onions; Potatoes	None
		All other crops, except: Onions; Potatoes	None
The REI modelling was driven by dimethomorph with the lower AOEL.			

Consultation

Given the biological activities of ametoctradin and dimethomorph:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.64.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100709 was: P008177 – Zampro.

The HSNO approval ERMA200388 stated in the *Application purpose* that Zampro was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.64.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling dimethomorph		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.15	Substance specific
DA = dermal absorption (expressed as a proportion)	0.20	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Ametoctradin:

AOEL = 2.0 mg/kg bw/d, based on the complete toxicology data package, with UF = 100 and a 20% correction for limited oral absorption (EPA, 2012, p6 citing EFSA, 2012, p7).

Dermal Absorption (DA) = 3% for active [0.03], based on data from a representative formulation, BAS 651 00 F (300g ametoctradin/L SC) (ERMA, 2012, p80 citing EFSA, 2012, p30).

Dimethomorph:

AOEL = 0.15 mg/kg bw/d (EPA, 2012b, p80, based on EFSA (2012)).

Dermal Absorption (DA) = 20% for active [0.20] (EPA, 2012b, p80).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100709 – Additional controls: indicated a maximum application rate of 0.8 L Zampro/ha (240g ametoctradin/ha and 180g dimethomorph/ha); 4 application/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.64.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100709	Substance Name	Zampro		ACVM Register	P008177		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Onions	Downy mildew	800 mL/ha; 4 appl'n/season; 7-10 day intervals	240g ametoctradin /ha; 4 application/year; 7-day interval	Vegetables – Reach/Pick	0.01	0.00	0.0	0.0
			180g dimethomorph /ha; 4		0.46	0.10	0.0	0.0

			application/year; 7-day interval					
Potatoes	Late blight	800 mL/ha; 4 appl'n/season; 7-14 day intervals	240g ametoctradin /ha; 4 application/year; 7-day interval	Vegetables – Reach/Pick	0.01	0.00	0.0	0.0
			180g dimethomorph /ha; 4 application/year; 7-day interval		0.46	0.10	0.0	0.0
All other crops: maximum stipulated application rate in HSR100709		0.8 L/ha (240g ametoctradin/ha and 180g dimethomorph/ha);	240g ametoctradin /ha; 4 application/year; 7-day interval	Default in absence of any data	0.01	No data	0.0	No data

		4 application/year; 7-day interval	180g dimethomorph /ha; 4 application/year; 7-day interval	Default in absence of any data	0.95	No data	0.0	No data

2.64.5. Notes

2.64.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EC, 2017a. *List of Endpoints - Dimethomorph*. Dimethomorph RAR_31.

<https://www.efsa.europa.eu/sites/default/files/consultation/consultation/Dimethomorph.zip>

EC, 2017b. *VOLUME 3 – Annex B (BAS 550 02F) – Dimethomorph: B.6 Toxicology and Metabolism Data and assessment of risks for humans*. Dimethomorph RAR_25.

<https://www.efsa.europa.eu/sites/default/files/consultation/consultation/Dimethomorph.zip>

EFSA, 2006. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance dimethomorph*. EFSA Scientific Report 2006;82,1-69.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2006.82r>

EFSA, 2012. *Conclusion on the peer review of the pesticide risk assessment of the active substance ametoctradin (BAS 650 F)*. EFSA Journal 2012;10(11),2921.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2921>

EPA HSNO Classifications: *Zampro*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/564589F8-8DD8-49CF-91D3-8C94DE205BB0>

EPA, 2021. *Approval for reissue: HSR100709*.

https://www.epa.govt.nz/assets/RecordsAPI/Zampro_HSR100709.pdf

EPA, 2012. *ERMA200388 Science Memo*.

2.64.7. Approved Substance ACVM Registered Label

P008177 – Zampro:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53594

2.65. HSR100716: Tripsol (22.5g acrinathrin/L and 12.6g abamectin/L EW)

2.65.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100716	Tripsol	Potatoes	24 hours ^a
		Tomatoes (outdoor)	24 hours ^a
		All other crops except: Potatoes: Tomatoes (outdoor)	8 days ^a
<p>The REI modelling was driven by abamectin with the lower AOEL.</p> <p>The REIs for Potatoes and Tomatoes were set because HSR100716 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1).</p> <p>The REI for All other crops was based on the calculated RQ.</p> <p>^a the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of acrinathrin and abamectin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.65.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100716 was: P008598 – Tripsol.

The HSNO approval APP201234 – *Decision* (EPA, 2012a, p1) stated in the *Purpose of the application* that Tripsol was for the control of tomato potato psyllid, potato tuber moth and aphid in potatoes and tomatoes, an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.65.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling abamectin		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific

DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Acrinathrin:

AOEL = 0.007 mg/kg bw/d, based on an acute neurotoxicity study in rats, with UF = 100 and a 71% correction for limited oral absorption (EPA, 2012a, p75 citing EFSA, 2013, p8).

Dermal Absorption (DA) = 8.6% for active [0.086] (ERMA, 2012a, p76).

Abamectin:

AOEL = 0.0025 mg/kg bw/d, EPA (2012a, p4) did not model abamectin in Tripsol, but used AOEL = 0.0025 mg/kg bw/d in other Approvals (for example: HSR101003 – Solvigo; HSR101034 – Abamet; HSR101144 – Abba; HSR101211 – Tina)].

Dermal Absorption (DA) = 10% for active [0.10], EPA (2012a, p4) did not model abamectin in Tripsol, but used 10% for active in other Approvals (for example: HSR101003 – Solvigo; HSR101034 – Abamet; HSR101144 – Abba; HSR101211 – Tina)].

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100716– Additional controls: indicated a maximum application rate of 0.85 L Tripsol/ha (19.13g acrinathrin/ha and 10.71g abamectin/ha); 4 application/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.65.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100716	Substance Name	Tripsol			ACVM Register	P008598	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Potatoes	Tomato/Potato Psyllid	850 mL/ha; 2-4 appl'n/season; 7-14 day intervals	19.13g acrinathrin/ha; 4 application/year; 7-day interval	Vegetables – Reach/Pick	0.45	0.09	0.0	0.0
			10.71g abamectin/ha; 4 application/year; 7-day interval		0.82	0.17	0.0	0.0

Tomatoes	Tomato/Potato Psyllid	850 mL/ha; 2 appl'n/season; 7-14 day intervals	19.13g acrinathrin/ha; 2 application/year; 7-day interval	Vegetables – Reach/Pick	0.33	0.07	0.0	0.0
			10.71g abamectin/ha; 2 application/year; 7-day interval		0.59	0.12	0.0	0.0
All other crops: maximum stipulated application rate in HSR100716		0.85 L/ha (19.13g acrinathrin/ha and 10.71g abamectin/ha); 4 application/year; 7-day interval	19.13g acrinathrin/ha; 4 application/year; 7-day interval	Default in absence of any data	0.93	No data	0.0	No data
			10.71g abamectin/ha; 4 application/year; 7-day interval	Default in absence of any data	1.70	No data	7.7	No data

2.65.5. Notes

HSR100716 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and REIs for Potatoes and Tomatoes of at least 24 hours are recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

[EPA (2012a, p4) stated that modelling of human exposures to abamectin had not been undertaken as previous assessments indicated that risks from the use of Tripsol would be acceptable.]

2.65.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2010. *Conclusion on the peer review of the pesticide risk assessment of the active substance acrinathrin*. EFSA Journal 2010;8(12),1872.

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2010.1872>

EFSA, 2013. *Conclusion on the peer review of the pesticide risk assessment of the active substance acrinathrin*. EFSA Journal 2013;11(12),3469.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2013.3469>

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance abamectin*. EFSA Journal 2020;18(8),6227. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6227>

EPA HSNO Classifications: *Tripsol*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/949683FA-DA23-4F4A-8A95-D4255AE82B4E>

EPA, 2012. *APP201234 – Application Form: Tripsol* <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201234/e804a4cd41/APP201234-Application-Form-APP201234-Tripsol.pdf>

EPA, 2012a. *APP201234 – Decision: Tripsol*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201234/7f82266ef8/APP201234-APP201234-Decision-FINAL-16.07.2012.pdf>

EPA, 2012b. *APP201234 Science Memo*.

EPA, 2021. *Approval for reissue: HSR100716*.

https://www.epa.govt.nz/assets/RecordsAPI/Tripsol_HSR100716.pdf

2.65.7. Approved Substance ACVM Registered Label

P008598 – Tripsol:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=55400

2.66. HSR100739: Brigade T&O (100g bifenthrin/L SC)

2.66.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100739	Brigade T&O 100 g/L SC	All crops	59 days
<p>The REI is based on the calculated RQ.</p> <p>HSR100739 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of bifenthrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.66.2. Discussion

As of 6 July 2021, we were unable to match HSR100739 to any ACVM registered product with an approved label.

The HSNO approval APP201428 (EPA, 2012, p1) stated in the *Purpose of the application* that Brigade T&O 100g/L SC was an insecticide for non-agricultural situations.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

2.66.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0075	Substance specific
DA = dermal absorption (expressed as a proportion)	0.35	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Bifenthrin:

AOEL = 0.0075 mg/kg bw/d, based on a 90-day neurotoxicity study and a 1-year toxicity study in dogs with UF = 100, and 50% correction for limited oral absorption (EPA, 2012a, p6 citing EFSA, 2011, p3).

Dermal Absorption (DA) = 35% for active [0.35] based on data for aqueous dilution in an *in vitro* human study with representative formulation, Talstar 8 SC [80g bifenthrin/L] (EPA, 2012a, p6 citing EFSA, 2011, p15).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100739 – Additional controls:) indicated a maximum application rate of 4.4 L/ha (440g bifenthrin/ha; 4 applications/year; 14-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.66.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100739	Substance Name	Brigade T&O 100 g/L SC		ACVM Register	None current		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in HSR100739		4.4 L/ha; 4 appl'n/year; 14-day interval	440 g a.i./ha; 4 appl'n/year; 14-day interval	Default in absence of any data	57.73	No data	58.5	No data

2.66.5. Notes

The EPA modelling on HSR100739 calculated a RQ of 10.36 as the outcome of the re-entry worker exposure assessment (EPA, 2012a, p7). The discrepancy with the RQ calculated above (57.73) may, in part, be due to different dermal absorption (DA) values used: 35% *cf* 3%. A DA of 35% was used here, following the EFSA Guidance document (2014): *For the dermal absorption percentage to be used for the assessment of worker, resident and bystander exposure towards surface deposits, the higher of the values for the undiluted product and the in-use dilution should be used. The use of higher dermal absorption is based on the precautionary principle as no measured values for dried residues after application of dilutions are available.*

2.66.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2011. *Conclusion on the peer review of the pesticide risk assessment of the active substance bifenthrin*. EFSA Journal 2011;9(5):2159.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2011.2159>

EPA HSNO Classifications: *Brigade T&O 100 g/L SC*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5895B793-DC36-459F-90AE-709C3B466887>

EPA, 2012. *Decision: APP201428*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201428/39967127f1/APP201428-APP201428-Decision-Final-HSR100739.pdf>

EPA, 2012a. *APP201428 – Brigade T&O 100 g/L SC: Science Memo*.

EPA, 2021. *Approval for reissue: HSR100739*.

https://www.epa.govt.nz/assets/RecordsAPI/Brigade_TO_100gl_SC_HSR100739.pdf

2.66.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.67. HSR100830: Rainbow Glufosinate-Ammonium 200 (200g glufosinate-ammonium/L EC)

2.67.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100830	Rainbow Glufosinate-Ammonium 200	Berryfruit – Raspberries and Brambles [Primocane control]	62 days
		Orchard and vineyard weed control; General weed control	None
		Stale seedbed preparation	None
		All crops except: Berryfruit – Raspberries and Brambles; Orchard and vineyards	73 days

Consultation

Given the herbicidal activity of glufosinate-ammonium:

- Is it valid to assume that dermal exposure of re-entry workers is unlikely for existing label claims for weed control and seedbed preparation; and
- Is it also valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses? In which case, the recommended REI for “All other crops” could be changed to “None”.

2.67.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100830 was: P008753 – Bastnate Herbicide.

The HSNO approval APP201745 – *Decision* (EPA, 2013, p1) stated in the *Purpose of the application* that Rainbow Glufosinate-ammonium was a non-selective herbicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

EFSA evaluated weed control in apple orchards, potato desiccation and transgenic maize, and concluded that worker exposure assessment was not relevant since re-entry was considered not necessary shortly after spraying (EFSA, 2005, p53).

2.67.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default

AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0021	Substance specific
DA = dermal absorption (expressed as a proportion)	0.09	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Glufosinate-ammonium:

AOEL = 0.0021 mg/kg bw/d, based on a developmental toxicity study in rabbits, with UF = 100; an additional safety factor = 3 due to the severity of the effects reported in both rats and rabbits; and, a 10% absorption factor due to limited oral absorption (EPA, 2009, p23 citing EFSA, 2005, p2).

Dermal Absorption (DA) = 9% for active [0.09], based on rat *in vivo* and *in vitro* data with representative products Basta SL18/Liberty SL18 (200g glufosinate-ammonium/L) (EPA, 2009, p25 citing EFSA, 2005, pp17-18).

Transfer Coefficient (TC) – EPA (2009, pp24-25) used 2,500 cm²/h to simulate scenarios with lower foliage contact.

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100830 – Additional controls: indicated a maximum application rate of 2030g glufosinate-ammonium/ha; 2 application/year; 90-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.67.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100830	Substance Name	Rainbow Glufosinate-Ammonium 200	ACVM Register	P008753			
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Berryfruit – Raspberries and Brambles	Primocane control	500-750 mL/100 L	2000g a.i./ha	Vegetables – Reach/Pick	73.47	15.28	62.0	39.3
Pipfruit, Kiwifruit, Stonefruit, Grapes, Citrus	Orchard and vineyard weed control	Rate appropriate to the weeds present	2030g a.i./ha; 2 appl'n/year; 90-day interval	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a

Stale seedbed preparation [Pre-emergence]		3-5 L/ha	1015g a.i./ha; 2 appl'n/year; 90-day interval	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a
Non-crop	General weed control	7.5-10 L/ha	2030g a.i./ha; 2 appl'n/year; 90-day interval	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a
All other crops: maximum stipulated application rate in HSR100830		2030g a.i./ha; 2 appl'n/year; 90-day interval	2030g a.i./ha; 2 appl'n/year; 90-day interval	Default in absence of any data	155.41	No data	72.8	No data
^a Not Applicable: Dermal exposure was considered unlikely for crop pre-emergence herbicide applications and weed clearance under established crop trees.								

2.67.5. Notes

[EPA cross-referenced HSR100096 – Nirvana (200g glufosinate-ammonium/L SC): the *Science Memo* indicated a maximum application rate of 2030g glufosinate-ammonium /ha; 2 application/year; 90-day interval (2009, p13)].

2.67.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2005. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance glufosinate*. EFSA Scientific Report 2005;27,1-81.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2005.27r>

EFSA, 2012. *Conclusion on the peer review of the pesticide risk assessment of confirmatory data submitted for the active substance glufosinate*. EFSA Journal 2012;10(3):2609.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2609>

EPA HSNO Classifications: *Rainbow Glufosinate-Ammonium 200*.

<https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/C9662254-E54D-4367-8B9D-14DFD3C0BB56>

EPA, 2013. *APP201745 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201745/6701f00c7a/APP201745-APP201745-Decision-Document.pdf>

EPA, 2009. *ERMA200028 – Nirvana*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200028/247dfe558b/ERMA200028-E-and-R-Report-FINAL-2009.11.06.pdf>

EPA, 2021. *Approval for reissue: HSR100830*.

https://www.epa.govt.nz/assets/RecordsAPI/Rainbow_Glufosinate-Ammonium_200_HSR100830.pdf

2.67.7. Approved Substance ACVM Registered Label

P008753 – Bastnate 200g/L SC:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=47825

2.68. HSR100873: Silo Smoke (142g permethrin/kg)

2.68.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100873	Silo Smoke	Empty farm buildings, grain storage facilities, and glasshouses	24 hours
<p>The REI was set because HSR100873 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1) and respiratory sensitiser (HSNO 6.5A; GHS Resp Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p> <p>For indoor scenarios, the REI applies once ventilation is complete.</p>			

Consultation

Given the biological activity of permethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Do the 15-minute and 8-hour duration activities modelled here appropriately assess the risk to re-entry workers?

2.68.2. Discussion

As of 6 July 2021, we were unable to match HSR100873 to any ACVM registered product with an approved label.

APP201844 – *Decision* (EPA, 2013a, p1) stated in *Purpose of the application* that Silo Smoke was an insecticide for use in empty farm buildings, grain storage facilities, and glasshouses.

The Silo Smoke generators were described as weighing 31g (net), and the maximum application rate was 1 generator/ 200m³. [i.e. approximately 0.425g/ 200m³ or 2.13mg/m³].

2.68.3. Approved Substance Specific Inputs for REI Modelling

Permethrin:

AOEL = 0.05 mg/kg bw/day (IPCS, 1990).

Inhalation absorption = 100%.

2.68.4. REI Modelling

The modelling is based on the EPA process adopted to assess the post-application inhalation exposure of HSR101001 (APP202303 – Grainguard Supersmoke: 100g pirimiphos-methyl/kg and 50g deltamethrin/kg)

The EPA modelled the scenario where re-entry occurred when the worker entered the treated empty grain store/silo to recover the spent generator(s) prior to filling the facility (EPA, 2014, pp9-11).

The duration of exposure was modelled at 15 minutes and only the inhalation route was estimated, as the use of gloves to pick up the discharged generator(s) was stipulated. Without data, EPA assumed that the substance(s) did not degrade, and there was no leakage from the silo during the 24-hour application period. Without data, the EPA used a ventilation rate of 0.6 air changes per hour (the minimal ventilation rate for a European residential house (citing ConsExpo 4, RIVM, 2006)).

As APP201844 – *Decision* (EPA, 2013a, p1) stated in the *Purpose of the application* that HSR100873 (Silo Smoke) was for use in empty farm buildings and glasshouses, as well as grain storage facilities, a re-entry worker inhalation exposure duration of 8 hours was also modelled to account for longer activities in those disinfected structures.

The EPA calculated the substance air concentration at various timepoints using the ConsExpo 4 equation:

$$C_{air} = \text{initial target concentration} \times e^{-qt}$$

Where: C_{air} = concentration at time t (mg/m^3);

Initial target concentration = $2.13 \text{mg permethrin}/\text{m}^3$;

e = constant 2.72;

q = ventilation rate (number of air changes per unit of time) = 0.6;

t = time from application (hour) = 0, 1, 2, 3.

The post-application inhalation exposure is calculated from (US EPA, 2012, eq 7.5):

$$E = \frac{C_0 \times IR}{ACH} \times [1 - e^{(-ACH \times ET)}]$$

Where: E = exposure (mg/day);

C_0 = initial concentration (mg/m³);

IR = inhalation rate (m³/hour) = 1 m³/h;

ACH = air changes per hour (hour⁻¹) = 0.6; and,

ET = exposure duration (hour/day) = 0.25 or 8.

Absorbed inhalation dose normalised to body weight is calculated from (US EPA, 2012, eq 7.6):

$$D = \frac{E \times AF}{BW}$$

Where: D = dose (mg/kg bw/day);

E = exposure (mg/day);

AF = absorption factor (inhalation) = 1; and,

BW = body weight (kg) = 70.

$$RQ = \frac{D}{AOEL}$$

Where: RQ = Risk Quotient;

D = dose (mg/kg bw/day); and,

AOEL = Acceptable Operator Exposure Level (mg/kg bw/day) = 0.05mg permethrin/kg bw/day.

Estimated re-entry inhalation exposure to permethrin of 15-minute duration

Time after venting (hours)	Estimated air concentration (mg/m ³)	Estimated worker exposure (mg/kg bw/day)	Risk Quotient (RQ)
0	2.13	0.007	0.14

Estimated re-entry inhalation exposure to permethrin of 8-hour duration			
Time after venting (hours)	Estimated air concentration (mg/m ³)	Estimated worker exposure (mg/kg bw/day)	Risk Quotient (RQ)
0	2.13	0.050	1.01
1	1.17	0.028	0.56

2.68.5. Notes

2.68.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EPA HSNO Classifications: *Silo Smoke*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/453BE8A0-14D2-411C-B1F0-1CD472B70355>

EPA, 2013. *APP201844 – Application Form: Silo Smoke*

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201844/18d82f7500/APP201844-APP201844-Application-form.pdf>

EPA, 2013a. *APP201844 – Decision: Silo Smoke*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201844/7e78bd971a/APP201844-APP201844-decision.pdf>

EPA, 2014. *APP202303 – Science Memo*.

IPCS, 1990. *Environmental health criteria: 94 – Permethrin*. World Health Organization, Geneva. <https://inchem.org/documents/ehc/ehc/ehc94.htm>

2.68.7. Approved Substance ACVM Registered Label

None current (August 2021).

2.69. HSR100878: Diazec 800

2.69.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100878	Diazec 800	All crops	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.69.2. Discussion

As of 9 November 2021, we were unable to match HSR100878 to any ACVM registered product with an approved label.

In the HSNO approval APP201878 – *Decision* (EPA, 2013, p21) *Purpose of the application*, Diazec 800 is stated to be an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, APP201878 (pp19-20).

2.69.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.69.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100878	Substance Name	Diazec 800		ACVM Register	None		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7-day interval	Default in absence of any data	980.79	No data	75.5	No data

2.69.5. Notes

2.69.6. Approved Substance Specific References

EPA HSNO Classifications: *Diazec 800*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/214C6986-54D8-4E29-A32E-B5C390FC05C1>

EPA, 2013. *APP201878 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201878/1b9ea355d2/APP201878-APP201878-Decision.pdf>

2.69.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.70. HSR100889: Kasumin (22g kasugamycin/L SC)

2.70.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100889	Kasumin	Kiwifruit	13 days
		All crops except: Kiwifruit	19 days

Consultation

Given the biological activities of kasugamycin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.70.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100889 was: P008603 – Kasumin.

The HSNO approval APP201581 – *Decision* (EPA, 2013, p1) stated in the *Purpose of the application* that Kasumin was a bactericide antibiotic for the control of *Pseudomonas syringae* pv. *actinidiae* (Psa-V) in kiwifruit.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

In Canada kasugamycin is used to control or suppress bacterial diseases in greenhouse and field fruiting vegetables, pome fruits (fire blight) and walnuts (PMRA, 2012, p5).

2.70.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default

AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.009	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Kasugamycin:

AOEL = 0.009 mg/kg bw/d, based on a 13-week toxicity study in rats, with UF = 100 and a 5% absorption factor due to limited oral absorption (EPA, 2013, p120).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2013, p11).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100889 – Additional controls: indicated a maximum application rate of 100g kasugamycin/ha; 4 applications/year; 10-day interval (EPA, 2021, p4).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.70.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100889	Substance Name	Kasumin		ACVM Register	P008603		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Kiwifruit [after harvest to before flower opening]	<i>Pseudomonas syringae</i> pv. <i>actinidiae</i> (Psa-V)	500 mL/100 L; 600-1000 l/ha; maximum 2 consecutive and 4 total appl'n/year; 10-14 day intervals	110g a.i./ha; 4 appl'n/year; 10-day interval	Berries – Reach/Pick	2.36	0.59	12.4	0.0

All other crops: maximum stipulated application rate in HSR100889		100 g/ha; 4 appl'n/year; 10- day interval	100 g/ha; 4 appl'n/year; 10- day interval	Default in absence of any data	3.71	No data	18.9	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.70.5. Notes

The EPA evaluation did not appear to link the calculated RQ (15.00) to the recommended REI (17 days without gloves) (EPA, 2013, pp122-123).

[In the EPA evaluation, the applicant suggested that based on the physico-chemical properties of the substance, a dermal absorption value of 50% was unrealistic, and this should be refined. The EPA staff accepted this argument and used an internationally recognised method of estimating dermal absorption values in the absence of data. The EPA staff remodelled the re-entry risks with a refined value of 10% [as used in this modelling], and determined that the REIs should be 7 days if gloves are worn, or 17 days with no use of PPE (EPA, 2013, p11).

EFSA (2017, p20) seems to imply that if oral absorption was less than 10% for water-based formulations, the oral absorption value (5% for kasugamycin) can be used instead of the default dermal absorption value for concentrated products (*in exceptional circumstances*).

PMRA (2012, p18) assumed 100% dermal absorption in the absence of any data.]

2.70.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EPA HSNO Classifications: *Kasumin*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/E43210BA-45B7-44C3-957D-4A1AF4C58CE8>

EPA, 2013. *APP201581 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201581/135f72d628/APP201581-APP201581-decision-final.pdf>

EPA, 2013a. *APP201581 – Kasumin: Science Memo*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201581/e1eebdf27e/APP201581-APP201581-Evaluation-and-review-report.pdf>

EPA, 2021. *Approval for reissue: HSR100889*. https://www.epa.govt.nz/assets/RecordsAPI/Kasumin_2L_HSR100889.pdf

PMRA, 2012. *Proposed Registration Decision – Kasugamycin*. PRD2012-30.

2.70.7. Approved Substance ACVM Registered Label

P008603 – Kasumin:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=54614

2.71. HSR100908: GF-2595

2.71.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100908	GF-2595	Maize	5 days
		Cereals	12 days
		Forage brassicas	18 days
		Potatoes	32 days
		All other crops, except: Forage brassicas; Cereals; Maize; Potatoes	58 days
The REI modelling was driven by lambda-cyhalothrin with the lower AOEL.			

Consultation

Given the biological activities of lambda-cyhalothrin and chlorpyrifos:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.71.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100908 was: P008826 – Cobalt Advanced.

In the HSNO approval APP201670 – *Decision* (ERMA, 2014, p1) *Purpose of the application* it stated that GF-2595 was for the control of insects.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

The REI modelling was driven by lambda-cyhalothrin with a lower AOEL (chlorpyrifos, 0.01mg/kg bw/day *cf* lambda-cyhalothrin, 0.00063mg/kg bw/day (EFSA, 2010, p38)).

2.71.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000224.

lambda-Cyhalothrin:

AOEL = 0.00063mg/kg bw/d, based on a multigeneration study in rats, with a UF of 200 and corrected for 25% oral absorption modelled here (EFSA, 2014, p10). ERMA used 0.0006mg/kg bw/d (ERMA, 2010, p38).

Dermal absorption (DA) = 25% (0.25), based on a range of emulsifiable granule (EG), emulsifiable concentrate (EC) and capsule suspension (CS) formulations, and modelled here (EFSA, 2014, p10). ERMA used 1% for lambda-cyhalothrin in Ampligo, an encapsulated suspension flowable concentrate, based on US EPA information on Warrior and Karate products that are both CS formulations (ERMA, 2010, p38). The EFSA data is more relevant to GF-2595, an EC formulation.

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code R-3). APP201670 – Additional controls: indicated a maximum application rate of 1500g chlorpyrifos/ha (EPA, 2014, p40).

2.71.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100908	Substance Name	GF-2595		ACVM Register	P008826 – Cobalt Advanced		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cereals	Cereal and Rose Aphid	333-667mL/ha; 2 appl'n	200g chlorpyrifos/ha; 2 appl'n; 7-day interval	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.07	NA	0.0	NA
			10g lambda-cyhalothrin/ha; 2 appl'n; 7-day interval		2.20 [0.09]	NA	11.4 [0.0]	NA

	Grain Aphid	467-667mL/ha; 2 appl'n	-					
Forage brassicas	Diamond back moth, White butterfly, Leaf miner	667mL/ha; with repeats	200g chlorpyrifos/ha	Vegetables – Reach/Pick	0.17	0.04	0.0	0.0
			10g lambda-cyhalothrin/ha		3.40 [0.14]	0.71 [0.03]	17.7 [0.0]	0.0 [0.0]
	Springtails	333mL/ha	-					
	Nysius (wheat bug – <i>Nysius huttoni</i>)	667mL/ha	-					
	Cutworm	667mL/ha	-					
	Aphids	467-667mL/ha	-					
Maize	Cutworm	667mL/ha	200g chlorpyrifos/ha	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.07	NA	0.0	NA
			10g lambda-cyhalothrin/ha		1.36 [0.05]	NA	4.4 [0.0]	NA
Potatoes	Potato tuber moth	667mL/ha; 14-day intervals	-					

	Tomato / Potato psyllid (<i>Bactericera cockerelli</i> , TPP)	1667mL/ha; 7- day intervals	500g chlorpyrifos/ha	Vegetables – Reach/Pick	0.43	0.09	0.0	0.0
26g lambda- cyhalothrin/ha			8.84 [0.35]		1.84 [0.07]	31.4 [0.0]	8.8 [0.0]	
All crops: maximum stipulated application rate in APP201670		1500 g chlorpyrifos/ha	1500 g chlorpyrifos/ha	Default in absence of any data	2.67	No data	7.8	No data
		77g lambda- cyhalothrin/ha	77g lambda- cyhalothrin/ha		54.48 [2.18]	No data	57.7 [11.2]	No data
^a Application of 1500g chlorpyrifos/ha is the equivalent of 5L formulation/ha or 77g lambda-cyhalothrin/ha								

2.71.5. Notes

Only the highest use rate was modelled for each crop.

2.71.6. Approved Substance Specific References

EFSA, 2014. *Conclusion on the peer review of the pesticide risk assessment of the active substance lambda-cyhalothrin*. EFSA Journal;12(5):3677.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2014.3677>

EPA HSNO Classifications: GF-2595. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/C7ADCFB4-1137-45A1-8E31-717FA4F22E12>

EPA, 2014. APP201670 – Decision. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201670/3c65d1c345/APP201670-APP201670-Decision.pdf>

ERMA, 2010. ERMA200435 – Evaluation and Review Report.

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200435/a65b41006e/ERMA200435-ERMA200435-EnR.pdf>

2.71.7. Approved Substance ACVM Registered Label

P008826 – Cobalt Advanced

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=51956

2.72. HSR100911: Ambush

2.72.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
		Glasshouse Tomatoes and Cucurbits; Forage brassicas; Vegetable brassicas; Fodder beet	12 days
		Flowers and ornamentals; Kiwifruit; Grapes	22 days
		Citrus; Persimmons; Avocados	34 days
		All other crops, except: Glasshouse Tomatoes and Cucurbits; Forage brassicas; Vegetable brassicas; Fodder beet; Flowers and ornamentals; Kiwifruit; Grapes; Citrus; Persimmons; Avocados	36 days

The REI modelling was driven by pirimiphos-methyl with the lower AOEL, and higher application rate.

The REIs were based on the calculated RQs.

HSR100602 is classified as a respiratory (6.5A; Resp Sens. 1) and skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1):

the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

Consultation

Given the biological activities of pirimiphos-methyl and permethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.72.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR100911 were: P008629 – Ambush, P009657 – Pirithrin and P009878 – Synergy Ambush.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p30) pirimiphos-methyl is included as an insecticide.

The application parameters used in the modelling for this substance were based on the additional control R-3: application parameters set by the EPA for approvals APP201948 (EPA, 2014a, p20) and APP202313 (EPA, 2014, p14), and the label claims on the approved label. For the label claims, the GAP data was supplemented with information taken from the crop specific APP201045: *Summary and Analysis Report* (EPA, 2012b-aj).

The REI modelling was driven by pirimiphos-methyl with a lower AOEL (0.02mg/kg bw/d (EPA, 2012, p140 citing EFSA, 2011) *cf* permethrin, 0.05mg/kg bw/day (IPCS, 1990)), and higher formulated concentration.

2.72.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000187.

2.72.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100911	Substance Name	Ambush		ACVM Register	P008629 – Ambush, P009657 – Pirithrin and P009878 – Synergy Ambush		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Avocados	Leafroller, Mealy bug, Greedy scale	100mL/100L water; 4-6 week intervals	1425g pirimiphos-methyl/ha; 4 appl'n; 7-day interval [Avo 9&16] ^{a,b}	Fruit from trees – Search/Reach/Pick	21.48	10.74	33.6	26.0

Citrus	Leafroller, Mealy bug, Scale crawler, Aphids	100mL/100L water; 4-6 week intervals	1425g pirimiphos- methyl/ha; 4 appl'n; 28-day interval [Cit 5] ^{a,c}	Fruit from trees – Search/Reach/Pick	11.92	5.96	27.2	19.6
Flowers and ornamentals	Mealy bug, Whitefly, Aphids, Caterpillars	1L/ha; 3-4 week intervals	600g pirimiphos- methyl/ha; 3 appl'n; 21-day interval [Orn 2] _{a,d}	Ornamentals – Cut/Sort/Bundle/Carry	6.01	1.68	19.7	5.7
Glasshouse Tomatoes and Cucurbits	Aphids, Caterpillars, Whitefly	100mL/100L water; 2-3 week intervals	475g pirimiphos- methyl/ha; 4 appl'n; 21-day interval [GHC 7] _{a,b}	Vegetables – Reach/Pick	2.39	0.50	9.5	0.0
Grapes	Leafroller, Mealy bug	Min. 1.5L/ha	712.5g pirimiphos- methyl/ha; 4 appl'n; 7-day interval	Berries – Reach/Pick	7.16	1.79	21.6	6.4

Kiwifruit	Leafroller, Latania scale, Greedy scale, Passionvine hopper	Min. 2L/ha; 3-4 week intervals	950g pirimiphos- methyl/ha; 4 appl'n; 21-day interval [Kiw 5] _{a,c}	Berries – Reach/Pick	5.73	1.43	19.1	3.9
Persimmons	Leafroller, Mealy bug, Greedy scale, Latania scale	Min. 2L/ha; 2-3 week intervals	1425g pirimiphos- methyl/ha; 4 appl'n; 28-day interval [Per 4] _{a,c}	Fruit from trees – Search/Reach/Pick	11.92	5.96	27.2	19.6
Forage brassicas	Springtails	100-200mL/ha; 2-3 week intervals	-					
	White butterfly, Leaf miner, Nysius, Argentine stem weevil	500mL-1L/ha; 2- 3 week intervals	-					
	Diamondback moth, Aphids	750mL-1L/ha; 2- 3 week intervals	475g pirimiphos- methyl/ha; 4 appl'n; 14-day	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0

			interval [F&F 13] a,d					
Vegetable brassicas	White butterfly, Diamondback moth, Caterpillars, Aphids, Leaf miner, Nysius	1L/ha; 2-3 week intervals	475g pirimiphos-methyl/ha; 4 appl'n; 14-day interval [Bra 6] a,c	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0
Fodder beet	Springtails	100-200mL/ha	-					
	Leaf miner, Nysius, Aphids, Argentine stem weevil	500mL-1L/ha	475g pirimiphos-methyl/ha; 4 appl'n; 14-day interval [F&F 13] a,d	Vegetables – Reach/Pick	2.81	0.58	11.3	0.0
All crops: maximum stipulated application rate in APP201045		1425g pirimiphos-methyl/ha; 4 appl'n/year	1425g pirimiphos-methyl/ha; 4 appl'n/year; 7-day interval	Default in absence of any data	24.83	No data	35.2	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ;								

^b Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: *Summary and Analysis Report*];

^c Label (non-critical) [relevant EPA, 2012. APP201045: *Summary and Analysis Report*];

^d Label: Critical (rate=label) [relevant EPA, 2012. APP201045: *Summary and Analysis Report*];

2.72.5. Notes

2.72.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR100911*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/06DAA805-B154-497D-89F9-41C943DD9233>

EPA, 2014. *APP202313 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202313/99b6b6bb15/APP202313-APP202313-Decision-FINAL-2014.12.09.pdf>

EPA, 2014a. *APP201948 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201948/761be0a2b7/APP201948-APP201948-Decision-with-coversheet-from-reassessment.pdf>

IPCS, 1990. *Environmental health criteria: 94 – Permethrin*. World Health Organization, Geneva. <https://incem.org/documents/ehc/ehc/ehc94.htm>

2.72.7. Approved Substance ACVM Registered Label

P008629 – Ambush

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=53138

P009657 – Pirithrin

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=46590

P009878 – Synergy Ambush

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55296

2.73. HSR100918: Crown 225SL Systemic Insecticide (225g acetamiprid/L SL)

2.73.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100918	Crown 225SL Systemic Insecticide	All crops	13 days

Consultation

Given the biological activities of acetamiprid:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.73.2. Discussion

As of 6 July 2021, we were unable to match HSR100918 to any ACVM registered product with an approved label.

The HSNO approval APP201813 (EPA, 2014, p1) stated in the *Purpose of the application* that Crown 225SL Systemic Insecticide was to be used for the control of insect pests in ornamental horticulture production nurseries.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

2.73.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.025	Substance specific
DA = dermal absorption (expressed as a proportion)	0.337	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Acetamiprid:

AOEL = 0.025 mg/kg bw/d, based on a developmental neurotoxicity (DNT) study in rats with UF = 100 (EPA, 2014a, p42 citing EFSA).

Dermal Absorption (DA) = 33.7% for active [0.337] (EPA, 2014a, p43 citing EU, 2004 review of acetamiprid).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100918 – Additional controls: indicated a maximum application rate of 50g acetamiprid/ha; 3 applications/season; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.73.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100918	Substance Name	Crown 225SL Systemic Insecticide		ACVM Register	None current		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in HSR100918		0.05kg a.i./ha; 3 appl'n/year; 7-day interval	50g a.i./ha; 3 appl'n/year; 7-day interval	Default in absence of any data	2.40	No data	12.6	No data

2.73.5. Notes

2.73.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2016. *Peer review of the pesticide risk assessment of the active substance acetamiprid*. EFSA Journal 2016;14(11):4610. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2016.4610>

EPA HSNO Classifications: *Crown 225SL Systemic Insecticide* <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/88CDACC6-FA83-4987-9774-DC434800F675>

EPA, 2014. *Decision: APP201813*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201813/84e6ceecd9/APP201813-APP201813-Decision.pdf>

EPA, 2014a. *APP201813 – Crown: Science Memo*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201813/c0f43123d9/APP201813-APP201813-Evaluation-and-Review-Report.pdf>

EPA, 2021. *Approval for reissue: HSR100918*. https://www.epa.govt.nz/assets/RecordsAPI/Crown_225SL_Systemic_Insecticide_HSR100918.pdf

2.73.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.74. HSR100932: Warlock Insecticide (19.2g emamectin benzoate/L EC)

2.74.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100932	Warlock Insecticide	All crops except: Apples, Pears; Avocados; Grapes; Kiwifruit	48 hours

Consultation

Given the biological activities of emamectin benzoate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.74.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100932 was: P008900 – Warlock Insecticide.

The HSNO approval APP201892 – *Decision* (EPA, 2014a, p1) stated in the *Purpose of the application* that Warlock was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.74.3. Approved Substance Specific Inputs for REI Modelling

The EPA did not conduct REI modelling for HSR100932, so the latest EFSA data was used.

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0003	Substance specific

DA = dermal absorption (expressed as a proportion)	0.02	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Emamectin benzoate:

AOEL = 0.0003 mg/kg bw/d, based on a 14-week toxicity study in dogs, with UF = 100; an extra UF = 5 due to the severity of the effects; and, a 55% correction for limited oral absorption (EFSA, 2012, p8).

Dermal Absorption (DA) = 2% for active [0.02], based on data from a representative formulation, AFFIRM 0.95% SG (EFSA, 2012, pp8&33).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100932 – Additional controls: indicated a maximum application rate of 310 mL Warlock/ha [5.95g emamectin benzoate/ha] (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval “Off label” uses should occur under this maximum.

2.74.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100932	Substance Name	Warlock Insecticide		ACVM Register	P008900		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears	Leafrollers	105 mL/ha on mature trees; 3 appl'n; 14-day interval	2.02g a.i./ha; 3 appl'n; 14-day interval	Fruit (from trees) - Search/Reach/Pick	0.32	0.16	0.0	0.0
Avocados	Leafrollers	10.5 mL/100L; no more than 6 appl'n; 14-day interval	5.95g a.i./ha; 6 appl'n; 14-day interval	Fruit (from trees) - Search/Reach/Pick	0.98	0.49	0.0	0.0

Grapes	Leafrollers	105 mL/ha; no more than 2 appl'n/season	2.02g a.i./ha; 2 appl'n; 14-day interval	Berries – Reach/Pick	0.19	0.05	0.0	0.0
Kiwifruit	Leafrollers	105 mL/ha on full crop canopy; no more than 3 appl'n/season; 21-day interval	2.02g a.i./ha; 3 appl'n; 21-day interval	Berries – Reach/Pick	0.18	0.04	0.0	0.0
All other crops: maximum stipulated application rate in HSR100932		310 mL/ha	5.95g emamectin benzoate/ha; 6 appl'n; 14-day interval	Default in absence of any data	1.14	No data	1.8	No data

2.74.5. Notes

[EPA (2012b, p2) stated that no quantitative human health risk assessment was undertaken for emamectin benzoate, as the active had already been assessed in earlier Approval(s) – unclear which.]

2.74.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2012. *Conclusion on the peer review of the pesticide risk assessment of the active substance emamectin*. EFSA Journal 2012;10(11),2955.

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2010.1872>

EPA HSNO Classifications: *Warlock Insecticide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/4D12CCFD-2F48-4978-B39B-E12734DADD5D>

EPA, 2014. *APP201892 – Application Form: Warlock Insecticide*.

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201892/682325c237/APP201892-APP201892-Application-form-Final.pdf>

EPA, 2014a. *APP201892 – Decision: Warlock Insecticide*.

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201892/ca0243fe03/APP201892-APP201892-Decision.pdf>

EPA, 2014b. *APP201892 Science Memo*.

EPA, 2021. *Approval for reissue: HSR100932*.

https://www.epa.govt.nz/assets/RecordsAPI/Warlock_Insecticide_HSR100932.pdf

2.74.7. Approved Substance ACVM Registered Label

P008900 – Warlock Insecticide:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=50524

2.75. HSR100967: Sercadis (300g fluxapyroxad/L SC)

2.75.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100967	Sercadis	Apples, Pears	9 days
		All other crops except: Apples, Pears; Onions; Winter squash	11 days

Consultation

Given the biological activities of fluxapyroxad:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.75.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100967 was: P008977 – Sercadis.

The HSNO approval APP202219 – *Decision* (EPA, 2014a, p1) stated in the *Purpose of the application* that Sercadis was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.75.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.04	Substance specific
DA = dermal absorption (expressed as a proportion)	0.16	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Fluxapyroxad:

AOEL = 0.04 mg/kg bw/d, based on a 90-day toxicity study in rats, with UF = 100 and a 68% correction for limited oral absorption (EPA, 2014b, p73 citing EFSA, 2012, p8).

Dermal Absorption (DA) = 14% for active [0.14] (ERMA, 2014b, p73).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100967 – Additional controls: indicated a maximum application rate of 150g fluxapyroxad/ha; 4 application/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.75.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100967	Substance Name	Sercadis			ACVM Register	P008977	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples; Pears	Black spot, Powdery mildew (apples only)	20 mL/100L; 4 appl'n/season; 7-10 day intervals; not later than 21 days after petal fall or fruitlets	150g a.i./ha; 4 appl'n/year; 7-day interval [GAP, EPA, 2014, p17]	Fruit (from trees) – Search/Reach/Pick	1.80	0.90	8.5	0.0

		reach 25mm diameter						
Onions	White rot control, Pink root suppression	700 mL/ha; 3 appl'n/season; 14-21 day interval	210g a.i./ha; 3 appl'n/season; 14-day interval	Vegetables – Reach/Pick	0.96	0.20	0.0	0.0
Winter squash	Powdery mildew	200 mL/ha; 2 appl'n/season	150g a.i./ha; 2 appl'n/year; 7-day interval	Vegetables – Reach/Pick	0.73	0.15	0.0	0.0
All other crops: maximum stipulated application rate in HSR100967		150g a.i./ha; 4 appl'n/year; 7-day interval	150g a.i./ha; 4 appl'n/year; 7-day interval	Default in absence of any data	2.09	No data	10.6	No data

2.75.5. Notes

2.75.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2012. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance fluxapyroxad (BAS 700 F)*. EFSA Journal 2012;10(1),2522.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2522>

EPA HSNO Classifications: *Sercadis*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/8D4719AE-914B-41AA-B475-738E01033B07>

EPA, 2014. *APP202219 – Application Form: Sercadis* <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202219/5a43ac37ef/APP202219-APP202219-Application-form.pdf>

EPA, 2014a. *APP202219 – Decision: Sercadis*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202219/8cec915499/APP202219-APP202219-Decision.pdf>

EPA, 2014b. *APP202219 Science Memo*.

EPA, 2021. *Approval for reissue: HSR100967*.

https://www.epa.govt.nz/assets/RecordsAPI/Sercadis_HSR100967.pdf

2.75.7. Approved Substance ACVM Registered Label

P008977 – Sercadis:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=51258

2.76. HSR100972: Raincozeb Plus (750g mancozeb/kg WDG)

2.76.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100972	Raincozeb Plus	Grapes; Strawberries; Boysenberries, Loganberries, Raspberries, Current (Red and Black), Gooseberries; Maize, Sweetcorn	20 days
		Ornamentals; Nectarines, Peaches	37 days
		Tomatoes; Potatoes; Beans, Broccoli, Brussels sprouts, Cabbage, Cauliflower, Carrots, Celery, Cucurbits: Cucumber, Melons, Pumpkin, Squash, Lettuce, Onions; Apples, Pears; Citrus	31 days
		All crops except: Grapes; Strawberries; Boysenberries, Loganberries, Raspberries, Current (Red and Black), Gooseberries; Maize, Sweetcorn; Tomatoes; Potatoes; Beans, Broccoli, Brussels sprouts, Cabbage, Cauliflower, Carrots, Celery, Cucurbits: Cucumber, Melons, Pumpkin, Squash, Lettuce, Onions; Apples, Pears; Citrus Ornamentals; Nectarines, Peaches	43 days
<p>The REIs are based on the calculated RQs.</p> <p>HSR100972 is classified as a skin sensitizer (HSNO 6.5B; GHS Skin Sens. 1) and respiratory sensitizer (HSNO 6.5A; GHS Resp Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of mancozeb:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.76.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100972 was: P009117 – Raincozeb Plus.

The HSNO approval APP202258 – *Decision* (EPA, 2014a, p1) stated in the *Purpose of the application* that Raincozeb Plus was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.76.3. Approved Substance Specific Inputs for REI Modelling

The EPA did not conduct REI modelling for HSR100972, so the latest EFSA data was used.

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.011	Substance specific

DA = dermal absorption (expressed as a proportion)	0.01	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Mancozeb:

AOEL = 0.011 mg/kg bw/d, based on a 1-year toxicity study in dogs, with UF = 100 and a 50% absorption factor due to limited oral absorption (EFSA, 2020, p9).

Dermal Absorption (DA) = 1% for active [0.01], based on data with representative formulations of mancozeb (Penncozeb 80 WP, Dithane M-45, Agria Mancozeb 800 WP) (EFSA, 2020, p10).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100972 – Additional controls: indicated a maximum application rate of 3200g mancozeb/ha; 6 application/year (EPA, 2021, p3). A 3-day interval was modelled, based on current label claims.

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

HSR100972 *Science Memo* GAP Table (pp4-12) listed application rates; numbers and interval ranges for the crop/pest covered by the label. However, using the highest application rate for the largest number of times often exceeded the stipulated maximum rate for the year. It was decided to model the highest application rate from the GAP table for a frequency, within the given range, that kept the total annual application rate (g a.i./ha) under the maximum stipulated rate.

2.76.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100972	Substance Name	Raincozeb Plus			ACVM Register	P009117	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears	Black spot, <i>Glomerella</i> , Ripe spot, Sooty blotch	110-160g/100L; 10-14 day intervals [GAP: 2400 g/ha; 1-10 appl'n/year; 10-14 day interval]	2,400g a.i./ha; 8 appl'n/year; 10-day interval	Fruits (from trees) – Search/Reach/Pick	6.71	3.35	27.5	17.5

Boysenberries, Loganberries, Raspberries	Downy mildew (Dryberry), Leaf spot, Rust	210g/100L; 10- 14 day intervals [GAP: 1,600 g/ha; 1-10 appl'n/year; 7- 21 day interval]	1,600g a.i./ha; 10 appl'n/year; 7-day interval	Berries – Reach/Pick	3.86	0.97	19.5	0.0
Citrus	Brown rot, <i>Alternaria</i> , <i>Verrucosis</i> , Citrus rust mite	210g/100L; 14- 28 day intervals [GAP: 3,200 g/ha; 1-12 appl'n/year; 14- 42 day interval]	3,200g a.i./ha; 6 appl'n/year; 14- day interval	Fruits (from trees) – Search/Reach/Pick	7.21	3.60	28.5	18.5
Current (Red and Black), Gooseberries	Leaf spot	210g/100L; 14- 21 day intervals [GAP: 1,600 g/ha; 1-10 appl'n/year; 7- 21 day interval]	1,600g a.i./ha; 10 appl'n/year; 7-day interval	Berries – Reach/Pick	3.86	0.97	19.5	0.0

Grapes	<i>Anthraco</i> (Black spot), Downy Mildew	210g/100L; 10-14 day intervals [GAP: 1,600 g/ha; 1-15 appl'n/year; 10-14 day interval]	1,600g a.i./ha; 10 appl'n/year; 10-day interval	Berries – Reach/Pick	2.99	0.75	15.8	0.0
Nectarines, Peaches	Rust	210g/100L; not within 6 weeks of harvest [GAP: 3,200 g/ha; 1-5 appl'n/year; 7-14 day interval]	3,200g a.i./ha; 6 appl'n/year; 7-day interval	Fruits (from trees) – Search/Reach/Pick	11.04	5.52	34.6	24.6
Strawberries	<i>Mycosphaerella</i> leaf spot (Frogs eye)	210g/100L or 2kg/ha; 10-14 or 7-day intervals [GAP: 1,600 g/ha; 1-10	1,500g a.i./ha; 12 appl'n/year; 7-day interval	Berries – Reach/Pick	3.64	0.91	18.6	0.0

		appl'n/year; 7-21 day interval]						
Ornamentals	Blights, Spots and Rust	210g/100L; 7-14 day intervals [GAP: 3,150 g/ha; 1-15 appl'n/year; 7-14 day interval]	3,200g a.i./ha; 6 appl'n/year; 7-day interval	Ornamentals – Cut/Sort/Bundle/Carry	12.27	3.43	36.2	17.8
Beans	<i>Anthraco</i> nose, Rust	160-210g/100L; 7-10 day intervals [GAP: 1,890 g/ha; 1-15 appl'n/year; 3-14 day interval]	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1
Broccoli, Brussels sprouts, Cabbage, Cauliflower	Downy Mildew	160-210g/100L; 7-10 or 3-4 day intervals [GAP: 1,890 g/ha; 1-15	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1

		appl'n/year; 3-14 day interval]						
Carrots	<i>Cercospora</i> leaf spot	160-210g/100L; 7-10 day intervals [GAP: 1,890 g/ha; 1-15 appl'n/year; 3-14 day interval]	1,890 / a.i.ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1
Celery	<i>Septoria</i> leaf spot	160-210g/100L; 7-10 or 3-5 day intervals [GAP: 1,890 g/ha; 1-15 appl'n/year; 3-14 day interval]	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1
Cucurbits: Cucumber, Melons, Pumpkin, Squash	<i>Anthraco</i> se, <i>Alternaria</i> , <i>Cercospora</i> leaf	160-210g/100L; 5-7 day intervals [GAP: 1,890 g/ha; 1-15	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1

	spot, Downy mildew	appl'n/year; 3-14 day interval]						
Lettuce	Downy mildew, Leaf spot, Ring spot	160-210g/100L; 7-10 day intervals [GAP: 1,890 g/ha; 1-15 appl'n/year; 3-14 day interval]	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1
Maize, Sweetcorn	Northern leaf blight	2.1kg/ha; repeat as necessary [GAP: 1,575 g/ha; 1-15 appl'n/year; 3-10 day interval]	1,575g a.i./ha; 12 appl'n/year; 7-day interval	Vegetables – Reach/Pick	3.18	0.66	16.7	0.0
Onions	<i>Botrytis</i> , Downy mildew	160-210g/100L; 7-10 day intervals	1,890g a.i./ha; 10 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.86	1.43	27.8	5.1

		[GAP: 1,890 g/ha; 1-15 appl'n/year; 3-14 day interval]						
Potatoes	Early blight (Target spot), Late blight	1.6-2.1kg/ha; 7-10 or 3-4 day intervals [GAP: 1,600 g/ha; 1-15 appl'n/year; 3-10 day interval]	1,575g a.i./ha; 12 appl'n/year; 3-day interval	Vegetables – Reach/Pick	6.00	1.25	25.8	3.2
Tomatoes	<i>Anthracnose</i> , Early blight, Late blight, <i>Septoria</i> leaf spot	160-210g/100L; 7-10 day intervals [GAP: 2,900 g/ha; 1-15 appl'n/year; 3-10 day interval]	2,900g a.i./ha; 6 appl'n/year; 3-day interval	Vegetables – Reach/Pick	8.58	1.78	31.0	8.4

All other crops: maximum stipulated application rate in HSR100972		3,200 g/ha; 6 appl'n/year	3,200g a.i./ha; 6 appl'n/year; 3- day interval	Default in absence of any data	19.69	No data	43.0	No data
GAP data from HSR100972 <i>Science Memo</i> .								

2.76.5. Notes

[EPA cross-referenced HSR007898/HSR06130 – Zyban WP: the *Decision* indicated a maximum application rate of 3.264kg mancozeb/ha and 0.795kg thiophanate-methyl/ha 6 times per season].

2.76.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance mancozeb*. EFSA Journal 2020;18(12):5755. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.5755>

EPA HSNO Classifications: *Raincozeb Plus*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/3A06C6F1-AE74-4360-8A3E-B511D270BC9D>

EPA, 2014. *APP202258 – Raincozeb Plus: Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202258/c7dd56ff80/APP202258-APP202258-FINAL-Application-Form-Raincozeb-Plus.pdf>

EPA, 2014a. *APP202258 – Raincozeb Plus: Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202258/10a741f7f4/APP202258-APP202258-Raincozeb-Plus-Decision-Document.pdf>

EPA, 2014b. *APP202258 – Raincozeb Plus: Science Memo*.

EPA, 2021. *Approval for reissue: HSR100972*. https://www.epa.govt.nz/assets/RecordsAPI/Raincozeb_Plus_HSR100972.pdf

2.76.7. Approved Substance ACVM Registered Label

P009117 – Raincozeb Plus:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=54047

2.77. HSR100984: Ox 240 Herbicide (240g oxyfluorfen/L EC)

2.77.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR100984	Ox 240 Herbicide	Apples, Grapes, Kiwifruit, Stonefruit [Post-emergence weed control under crops]	None
		Forest nurseries, Pinus, Cupressus spp., Eucalyptus, Racosperma (Acacia) spp. [Post-emergence weed control under crops]	19 days
		All crops except: Apples, Grapes, Kiwifruit, Stonefruit; Forest nurseries, Pinus, Cupressus spp., Eucalyptus, Racosperma (Acacia) spp.	40 days

Consultation

Given the herbicidal activity of oxyfluorfen:

- Is it valid to assume that dermal exposure of re-entry workers is unlikely for existing label claims for post-emergence weed control under fruit crops; and,
- Is it valid to assume that dermal exposure of re-entry workers is unlikely for existing label claims for post-emergence weed control in forestry nurseries and under tree crops; and,
- Is it also valid to assume that dermal exposure of re-entry workers is unlikely for any existing and potential future “off label” uses? In which case, the recommended REI for “All other crops” could be changed to “None”.

2.77.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR100984 was: P009166 – Ox 240 Herbicide.

The HSNO approval APP202211 – *Decision* (EPA, 2014, p1) stated in the *Purpose of the application* that Ox 240 was an herbicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

EFSA concluded that an exposure assessment for workers was not required (2010, p25).

2.77.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.03	Substance specific

DA = dermal absorption (expressed as a proportion)	0.18	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Oxyfluorfen:

AOEL = 0.03 mg/kg bw/d, based on a 52-week toxicity study in dogs, with UF = 100 and assuming 100% absorption in the absence of data (EPA, 2009, p31).

Dermal Absorption (DA) = 18% [0.18] citing rat data from USEPA (2002) (EPA, 2009, p30).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100984 – Additional controls: indicated a maximum application rate of 1500g oxyfluorfen/ha; 1 application/year (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

The only ACVM registered product P009166 – Ox 240 also has a label claim for pre-emergence weed control for Apples, Grapes, Kiwifruit and Stonefruit this use was not modelled because it was accepted that dermal exposure of re-entry workers is unlikely for pre-emergence weed control.

Transfer Coefficient (TC) – EPA (2009, p33) used 2,500 cm²/h to simulate a forestry nursery scenario for transplanting and similar activities, and was used in this modelling.

2.77.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR100984	Substance Name	Ox 240	ACVM Register	P009166			
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Grapes, Kiwifruit, Stonefruit [Post-emergence]	Weed control	2-3 L/ha by boom spray	720g a.i./ha	NA	NA	NA	NA	NA
Forest nurseries, Pinus, Cupressus spp., Eucalyptus, Racosperma	Weed control	2-3 L/ha	720g a.i./ha	Vegetables – Reach/Pick ^b	3.70	0.77	18.9	0.0

(Acacia) spp. [Post-emergence]								
All other crops: maximum stipulated application rate in HSR100984		1500g a.i./ha; 1 appl'n/year	1500g a.i./ha; 1 appl'n/year	Default in absence of any data	16.05	No data	40.0	No data
<p>^a Crop growth stage only stipulated if detailed on the label;</p> <p>^b EPA used 2,500 cm²/h to simulate a forestry nursery scenario for transplanting and similar activities (EPA, 2009, p33);</p> <p>NA - Not Applicable: Dermal exposure was considered unlikely for crop post-emergence herbicide applications under established fruit crop trees.</p>								

2.77.5. Notes

[EPA cross-referenced HSR100031 – Oxy 500 SC (500g oxyfluorfen/L SC): the *Science Memo* indicated a maximum post-emergence application rate of 0.789kg oxyfluorfen/ha once per season, or 0.126kg oxyfluorfen/ha, 3 applications per year].

2.77.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2010. *Conclusion on the peer review of the pesticide risk assessment of the active substance oxyfluorfen*. EFSA Journal 2010;8(1):1906.

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2010.1906>

EFSA, 2015. *Peer review of the pesticide risk assessment of the active substance oxyfluorfen in light of confirmatory data submitted*. EFSA Journal 2015;13(8):4205.

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2015.4205>

EPA HSNO Classifications: *Ox 240 Herbicide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/ED787B37-011D-4C11-B320-AB42ED34BCB1>

EPA, 2009. *HSR08141 – Oxy 500*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/HSR08141/03ac860e32/E-and-R-Report.pdf>

EPA, 2014. *APP202211 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202211/52f25cd172/APP202211-APP202211-Decision.pdf>

EPA, 2014a. *APP203024 – Ox 240 Herbicide: Science Memo*.

EPA, 2021. *Approval for reissue: HSR100984*.

https://www.epa.govt.nz/assets/RecordsAPI/Ox_240_Herbicide_HSR100984.pdf

2.77.7. Approved Substance ACVM Registered Label

P009166 – Ox 240:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=43818

2.78. HSR101001: Grainguard Supersmoke

2.78.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR101001	Grainguard Supersmoke	Empty grain stores/silos	3 hours after ventilation started ^a
The REI modelling was driven by deltamethrin with the lower AOEL. ^a gloves should be worn to recover spent generator(s).			

Consultation

Given the biological activities of pirimiphos-methyl and deltamethrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?
- b) Does the 15-minute duration activity modelled here appropriately assess the risk to re-entry workers?

2.78.2. Discussion

As of 6 July 2021, we were unable to match HSR101001 to any ACVM registered product with an approved label.

In the HSNO approval APP202303 – *Decision* (EPA, 2015, p1) *Purpose of the application* it stated that Grainguard Supersmoke was used for the disinfestation of grain stores/silos. The application implied that the use was for disinfecting empty grainstores/silos prior to filling with grain (EPA, 2014, Table 3).

In the HSNO approval APP202303 – *Decision* (EPA, 2015, p20) *Additional controls* it stated that:

- (1) No person can use this substance for any purpose other than for the internal treatment of a grain store/silo.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval. [The Information Sheet for Orion Agriscience GrainMaster SuperSmoke (100g pirimiphos-methyl/kg and 50g deltamethrin/kg) stated that each 60g generator treated 333m³ or grain stores with capacity for 250MT barley, 200MT wheat or 150MT oats (Orion, 2021)].

The HSNO approval APP202303 – *Decision* stated that one Grainguard Supersmoke generator was intended to treat up to 500m³ (EPA, 2015, p2).

2.78.3. Approved Substance Specific Inputs for REI Modelling

[Each 60g generator would contain 6g pirimiphos-methyl and 3g deltamethrin that would give in a silo of 333m³, rates of: 18mg pirimiphos-methyl/m³ and 9mg deltamethrin/m³.]

Pirimiphos-methyl:

AOEL = 0.02 mg/kg bw/d (EPA, 2012a, p140 citing EFSA, 2011).

Inhalation absorption = 100%.

Initial (t=0) concentration = 18mg pirimiphos-methyl/m³.

On the basis of no data, assumed that pirimiphos-methyl did not degrade or settle-out of the enclosed atmosphere, and no leakage occurred from the silo prior to ventilation.

Deltamethrin:

AOEL = 0.0075mg/kg bw/day, based on neurological signs in 90-day and 1-year studies in dogs, with a UF = 100, and adjusted for 75% oral absorption (EPA, 2015, p30 citing EFSA, 2009).

Inhalation absorption = 100% (EPA, 2015, p31).

Initial (t=0) concentration = 9mg deltamethrin/m³ (EPA, 2015, p31).

Breathing rate = 1m³/hour (EPA, 2015, p31).

Body weight = 70kg (EPA, 2015, p31).

2.78.4. REI Modelling

The EPA modelled the scenario for deltamethrin (pirimiphos-methyl had been assessed in an earlier application) where re-entry occurred when the worker entered the treated empty grain store/silo to recover the spent generator(s) prior to filling the facility (EPA, 2014, pp9-11).

The duration of exposure was modelled at 15 minutes and only the inhalation route was estimated, as the use of gloves to pick up the discharged generator(s) was stipulated. Without data, EPA assumed that deltamethrin did not degrade, and there was no leakage from the silo during the 24-hour application period. Without data, the EPA used a ventilation rate of 0.6 air changes per hour (the minimal ventilation rate for a European residential house (citing ConsExpo 4, RIVM, 2006)).

The EPA calculated the deltamethrin air concentration at various timepoints using the ConsExpo 4 equation:

$$C_{air} = \text{initial target concentration} \times e^{-qt}$$

Where: C_{air} = concentration at time t (mg/m³);

Initial target concentration = 9 mg deltamethrin/m³;

e = constant 2.72;

q = ventilation rate (number of air changes per unit of time) = 0.6;

t = time from application (hour) = 0, 1, 2, 3.

The post-application inhalation exposure is calculated from (US EPA, 2012, eq 7.5):

$$E = \frac{C_0 \times IR}{ACH} \times [1 - e^{(-ACH \times ET)}]$$

Where: E = exposure (mg/day);

C_0 = initial concentration (mg/m³);

IR = inhalation rate (m³/hour) = 1;

ACH = air changes per hour (hour⁻¹) = 0.6; and,

ET = exposure duration (hour/day) = 0.25.

Absorbed inhalation dose normalised to body weight is calculated from (US EPA, 2012, eq 7.6):

$$D = \frac{E \times AF}{BW}$$

Where: D = dose (mg/kg bw/day);

E = exposure (mg/day);

AF = absorption factor (inhalation) = 1; and,

BW = body weight (kg) = 70.

$$RQ = \frac{D}{AOEL}$$

Where: RQ = Risk Quotient;

D = dose (mg/kg bw/day); and,

AOEL = Acceptable Operator Exposure Level (mg/kg bw/day).

Estimated re-entry inhalation exposure to deltamethrin			
Time after venting (hours)	Estimated air concentration (mg/m ³)	Estimated worker exposure (mg/kg bw/day)	Risk Quotient (RQ)
0	9	0.03	4.0
1	4.9	0.02	2.2
2	2.7	0.01	1.2
3	1.5	0.005	0.7

The calculated pirimiphos-methyl initial air concentrations will be 18 mg/m³, twice that of deltamethrin.

Estimated re-entry inhalation exposure to pirimiphos-methyl			
Time after venting (hours)	Estimated air concentration (mg/m ³)	Estimated worker exposure (mg/kg bw/day)	Risk Quotient (RQ)
0	18	0.06	3.0
1	9.8	0.04	1.6
2	5.4	0.02	0.9
3	3.0	0.01	0.5

2.78.5. Notes

The HSNO approval APP202303 – *Decision* indicated that exposure modelling had not been carried out for pirimiphos-methyl in Grainguard Supersmoke as it had already been assessed in similar approved substances (EPA, 2015, p4).

2.78.6. Approved Substance Specific References

EPA HSNO Classifications: *HSR101001*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B6DD29C2-C249-4293-B60D-09471E61F03E>

EPA, 2014. *APP202303 – Science Memo*.

EPA, 2015. *APP202303 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202303/bd48ecfd57/APP202303-APP202303-FINAL-Grainguard-Supersmoke-Decision.pdf>

Orion, 2021. *Orion Agriscience GrainMaster SuperSmoke - Information Sheet*. <https://www.orionagriscience.co.nz/storage/products/March2021/GrainMaster%20SuperSmoke%20Information%20Sheet.pdf>

US EPA, 2012. *Standard Operating Procedures for Residential Pesticide Exposure Assessment*. https://www.epa.gov/sites/default/files/2015-08/documents/usepa-opp-hed_residential_sops_oct2012.pdf

2.78.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.79. HSR101003: Solvigo (36g abamectin/L + 72g thiamethoxam/L SC)

2.79.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR101003	Solvigo	Bulb onions	11 days
		All crops except: Bulb onions	21 days
The REI modelling was driven by abamectin with the lower AOEL.			

Consultation

Given the biological activities of abamectin and thiamethoxam:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.79.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101003 was: P009133 – Solvigo.

The HSNO approval APP201999 – *Decision* (EPA, 2016a, p1) stated in the *Purpose of the application* that Solvigo was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.79.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling abamectin		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Abamectin:

AOEL = 0.0025 mg/kg bw/d (EPA, 2014, p59).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2014, p60).

Thiamethoxam:

AOEL = 0.08 mg/kg bw/d (EPA, 2014, p60).

Dermal Absorption (DA) = 25% [0.25] (EPA, 2014, p 60).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101003 – Additional controls: indicated a maximum application rate of 750 mL/ha (27g abamectin/ha and 54g thiamethoxam/ha); 4 applications/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.79.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101003	Substance Name	Solvigo			ACVM Register	P009133	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Bulb Onions	Onion thrips	750 mL/ha; max. 4 appl'n/year; 7-day interval	27g abamectin/ha; 4 appl'n; 7-day interval	Vegetables – reach/pick	2.06	0.43	10.4	0.0
			54g thiamethoxam/ha; 4 appl'n; 7-day interval		0.32	0.07	0.0	0.0

All other crops: maximum stipulated application rate in HSR101003		750 mL/ha; 4 appl'n/year; 7- day interval	27g abamectin/ha; 4 appl'n; 7-day interval	Default in absence of any data	4.29	No data	21.0	No data
			54g thiamethoxam/ha; 4 appl'n; 7-day interval		0.67	No data	0.0	No data

2.79.5. Notes

2.79.6. Approved Substance Specific References

EC, 2018. *Combined Draft Renewal Assessment Report – Thiamethoxam: Volume 1*. RAR-CLH
<https://echa.europa.eu/documents/10162/b3750dbe-7250-26f0-a94c-9becb622a07c>

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance abamectin*. EFSA Journal 2020;18(8):6227. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6227>

EPA HSNO Classifications: *Solvigo*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/F82A6C06-BB08-4635-B2C5-CEE3071907E6>

EPA, 2014. *APP201999 – Staff Evaluation Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/89e939b78d/APP201999-APP201999-Staff-Evaluation-and-Review-Report.pdf>

EPA, 2016. *APP201999 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/03eae6a773/APP201999-APP201999-Application-Form.pdf>

EPA, 2016a. *APP201999 – Decision amended*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/0c9fe85898/APP201999-APP201999-Decision-amended-FINAL.pdf>

EPA, 2021. *Approval for reissue: HSR101003*.
https://www.epa.govt.nz/assets/RecordsAPI/Solvigo_HSR101003.pdf

2.79.7. Approved Substance ACVM Registered Label

P009133 – Solvigo:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=54401

2.80. HSR101016: Dianex

2.80.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR101016	Dianex	Cereals	39 days
		Pasture; Forage brassicas; Seed crops (grass, clover, and vegetables)	53 days
		Apples, Pears; Tomatoes (outdoor)	68 days
		All other crops, except: Cereals; Forage brassicas; Pasture; Apples, Pears; Seed crops (grass, clover, vegetables); Tomatoes (outdoor)	76 days

Consultation

Given the biological activity of diazinon:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.80.2. Discussion

As of 6 July 2021, the only ACVM registered products with an approved label for HSR101016 were P009158 – Dianex and P009258 – Diazate.

In the HSNO approval APP202388 – *Decision* (EPA, 2013, p21) *Purpose of the application*, Dianex is stated to be used for the control of pests.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, APP202388 (p18), and the label claims on the approved labels.

2.80.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000174.

2.80.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101016	Substance Name	Dianex		ACVM Register	P009158 – Dianex and P009258 – Diazate		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears	Overwintering San Jose scale, woolly apple aphid, aphids, leaf curling midge, mealy bug	60 mL/100L	960 a.i./ha; 4 applications; 7-day intervals [Pip9] ^{b,c}	Search/Reach/Pick	434.20	217.10	66.6	59.0

Cereals	Cereal aphids	800 mL/ha	640g a.i./ha; 1 application	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	32.91	NA	38.3	NA
Forage brassicas	Army caterpillar, diamondback moth	800 mL/ha	640g a.i./ha; 1 application	Vegetables – Reach/Pick	82.29	17.12	48.4	31.1
	Springtails	350 mL/ha	280g a.i./ha; 1 application [Pas18] ^{c,d}	Vegetables – Reach/Pick	36.00	7.49	39.3	22.1
Pasture	Grass grub	3 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Pasture – Mowing	61.71	NA	45.2	NA
	Porina caterpillar	1-1.5 L/ha	1200g a.i./ha; 1 application [Pas14] ^{c,d}	Pasture – Mowing	30.86	NA	37.6	NA
	Lucerne flea	350 mL/ha	280g a.i./ha; 1 application [Pas18] ^{c,d}	Pasture – Mowing	7.20	NA	21.6	NA

Seed crops (grass, clover, vegetables, ryegrass)	Grass grub, carrot rust fly (carrot and parsnip seed crops only)	3 L/ha	2400g a.i./ha; 1 application [Pas13] ^{c,d}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	123.43	NA	52.8	NA
Seed crops (Carrots and Parsnips)	Carrot rust fly							
Tomatoes (outdoor)	Aphids, caterpillars, thrips	1 L/ha; repeat as necessary	900g a.i./ha; 4 applications; 7- day interval [FTo7] ^{c,g}	Berries – Reach/Pick	271.37	61.4	67.84	46.2
All crops: maximum stipulated application rate in APP201045		2400 g a.i./ha; 2 appl'n/year; minimum 7-day interval	2400 g a.i./ha; 2 appl'n/year; 7- day interval	Default in absence of any data	980.79	No data	75.5	No data
^a Crop growth stage only stipulated if detailed on the label; ^b Application rate from relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i> ; ^c Industry source: Critical (rate>label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>] ^d Critical (rate=label) [relevant EPA, 2012. <i>APP201045: Summary and Analysis Report</i>].								

2.80.5. Notes

2.80.6. Approved Substance Specific References

EPA HSNO Classifications: *Dianex*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/6FC8BCA2-7EB7-479D-B63F-8820BA0E72C0>

EPA, 2015. *APP202388 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202388/77ea425ebf/APP202388-APP202388-Decision.pdf>

2.80.7. Approved Substance ACVM Registered Label

P009158 – Dianex

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=43572

P009258 – Diazate

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=55846

2.81. HSR101029: Blossom Protect Component B (*Aureobasidium pullulans* WDG)

2.81.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101029	Blossom Protect Component B	All crops	24 hours
<p>The REI for All crops was set because HSR1001029 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1); HSR1001029 is also classified as a respiratory sensitiser (HSNO 6.5A; GHS Resp Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activity of *Aureobasidium pullulans* WDG:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.81.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101029 were: P009589 – Aureo Gold; and, P009700 Botector.

The HSNO approval APP202131– *Decision* (EPA, 2011a, p1) stated in the *Purpose of the application* that Blossom Protect was for the protection of pome fruit trees against the disease organism *Erwinia amylovora* (fire blight) and kiwifruit vines from *Pseudomonas syringae* pv. *actinidiae* (Psa).

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

The EPA noted:

“The currently available exposure models are not appropriate for microorganisms. However, although an assessment of the operator, worker and bystander exposure is not necessary, the staff note that there is uncertainty about the possible metabolites/toxins produced by MCPA (aureobasidin A, B, C, E, S2b, S3, and S4).

“Therefore the staff recommend that a restricted entry interval (REI) of 4 hours unless wearing appropriate PPE is set in order to mitigate the risk of the uncertainties. The US EPA (EPA Reg. No. 86174-4) has set the following control; “Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours unless wearing appropriate PPE”. The staff consider this control should be applied to Blossom Protect.” (EPA, 2015b, p117).

No modelling was possible.

The EFSA concluded that:

“as *Aureobasidium pullulans* DSM 14940 and DSM 14941 did not elicit any signs of toxicity, infectivity and pathogenicity, an assessment of the operator, worker and bystander exposure is not necessary.” (EFSA, 2013, p 7).

2.81.3. Approved Substance Specific Inputs for REI Modelling

Aureobasidium pullulans:

AOEL = none derived (EPA, 2015a, p117).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101029 – Additional controls: indicated a maximum application rate of either: 4500g a.i./ha; 10 applications/year; 5-day interval; or, 1500g a.i./ha; 4 applications/year; 2-day interval (EPA, 2021, p3 “Off label” uses should occur under this maximum.

2.81.4. Notes

HSR101029 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and a REI for All crops of at least 24 hours is recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

2.81.5. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2013. *Conclusion on the peer review of the pesticide risk assessment of the active substance Aureobasidium pullulans (strains DSM 14940 and DSM 14941)*. EFSA Journal 2013;11(4):3183. <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2013.3183>

EPA HSNO Classifications: *Blossom Protect Component B*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/9FA1DDA1-BE65-4B0B-9934-84411C551873>

EPA, 2015. *APP202131 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202131/fae3aaa9e1/APP202131-APP202131-Application-Form.pdf>

EPA, 2015a. *APP202131 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202131/8e0b988be6/APP202131-APP202131-Decision.pdf>

EPA, 2015b. *APP202131 – Evaluation and Review Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202131/a811bb4725/APP202131-APP202131-Evaluation-and-Review-Report.pdf>

EPA, 2021. *Approval for reissue: HSR101029*. https://www.epa.govt.nz/assets/RecordsAPI/Blossom_Protect_Component_B_HSR101029.pdf

2.81.6. Approved Substance ACVM Registered Label

P009589 – Aureo Gold (4×10^9 cfu/g):

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53056

P009700 – Botector (5×10^9 cfu/g):

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=54086

2.82. HSR101034: Abamet (18g abamectin/L EC)

2.82.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101034	Abamet	Tomatoes (indoor)	48 hours ^a
		Strawberries	6 days
		Apples and Pears (Pipfruit)	8 days
		Avocados	14 days
		All crops except: Kiwifruit; Potatoes; Ornamentals; Tomatoes (indoor); Strawberries; Apples, Pears; Avocados	21 days
^a For indoor scenarios, the REI applies once ventilation is complete.			

Consultation

Given the biological activities of abamectin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.82.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101034 was: P008914 – Abamet.

The HSNO approval APP202414– *Decision* (EPA, 2015a, p1) stated in the *Purpose of the application* that Abamet was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.82.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling abamectin		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific
DA = dermal absorption (expressed as a proportion)	0.10	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Abamectin:

AOEL = 0.0025 mg/kg bw/d (EPA, 2014, p59).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2014, p60).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR100709 – Additional controls: indicated a maximum application rate of 27g abamectin/ha; 4 applications/year; 7-day interval (EPA, 2021, p3). .

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.82.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101034	Substance Name	Abamet		ACVM Register	P008914		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples and Pears (Pipfruit)	European Red Mite, Two-spotted Mite	37.5 mL/100L; max. 2000L spray mix/ha; do not exceed 1.5 L/ha; only 1 appl'n per season	27g a.i./ha	Fruits (from trees) – search/reach/pick	1.67	0.83	7.4	0.0

Avocados	Six-spotted Mite	37.5 mL/100L; max. 3/season; interval 14-28 days	27g a.i./ha; 3 appl'n/season; 14-day interval	Fruits (from trees) – search/reach/pick	2.54	1.27	13.4	3.4
Kiwifruit	Leafrollers	25 mL/100L; not within 120 days of harvest	11.25g a.i./ha; 3 appl'n/season; 14-day interval	Berries – reach/pick	0.70	0.18	0.0	0.0
Ornamental (Roses, Chrysanthemums, Carnations, indoor foliage plants)	Two-spotted Mite	25-50 mL/100L; max. 3 appl'n/season; 7-10 day interval	9g a.i./ha; 3 appl'n/season; 14-day interval	Ornamentals – cut/sort/bundle/carry	0.94	0.26	0.0	0.0
Potatoes	Tomato-potato psyllid	600 mL/ha; max. 4 appl'n/season; 7-day interval	10.80g a.i./ha; 4 appl'n/season; 7-day interval	Vegetables – reach/pick	0.82	0.17	0.0	0.0
Strawberries	Two-spotted Mite	100 mL/100L; max. 3 appl'n/season;	18g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.48	0.37	5.6	0.0

		7-10 day interval						
Tomatoes (indoor)	Two-spotted Mite, Tomato russet mite	60-90 mL/100L; max. 3 appl'n/season; minimum 300-450 mL/ha	16.2g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.11	0.23	1.5	0.0
All other crops: maximum stipulated application rate in HSR101034		27g a.i./ha; 4 appl'n; 7-day interval	27g a.i./ha; 4 appl'n/season; 7-day interval	Default in absence of any data	4.29	No data	21.0	No data

2.82.5. Notes

GAP data from *APP202414 – Application* (EPA, 2015, pp17-21).

EPA cross-referenced HSR101003 – Solvigo (EPA, 2014).

The vapour pressure of abamectin was reported to be negligible (Pohanish, 2014).

2.82.6. Approved Substance Specific References

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance abamectin*. EFSA Journal 2020;18(8):6227. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6227>

EPA HSNO Classifications: *Abamet*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/7FA1CBEE-EE39-41F8-8991-DB493718DA1B>

EPA, 2014. *APP201999 – Staff Evaluation Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/89e939b78d/APP201999-APP201999-Staff-Evaluation-and-Review-Report.pdf>

EPA, 2015. *APP202414 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202414/3395acb2ba/APP202414-APP202414-Application-form-Abamet.pdf>

EPA, 2015a. *APP202414 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202414/46d68aeefb/APP202414-APP202414-Decision-FINAL-2015-06-18.pdf>

EPA, 2015b. *APP202414 – Science Memo*.

EPA, 2021. *Approval for reissue: HSR101034*.

https://www.epa.govt.nz/assets/RecordsAPI/Abamet_HSR101034.pdf

Pohanish, R., 2014 *“Stittig’s Handbook of Pesticides and Agricultural Chemicals 2nd Edition.”*

2.82.7. Approved Substance ACVM Registered Label

P008914 – Abamet:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=40331

2.83. HSR101069: Fury 120 SC (80g bifenthrin/L and 40g alpha-cypermethrin/L SC)

2.83.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101069	Fury 120 SC	All uses	None
The REI modelling was driven by bifenthrin with the lower AOEL.			

Consultation

Given the biological activities of bifenthrin and alpha-cypermethrin:

- a) The original Approval was for urban pest control. Is the modelling appropriate for potential use scenarios;
- b) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.83.2. Discussion

As of 6 July 2021, we were unable to match HSR101069 to any ACVM registered product with an approved label.

The HSNO approval APP202599 (EPA, 2015, p1) stated in the *Purpose of the application* that Fury 120 SC was an urban pest control product.

The original application was for “general surface applications” and “crack and crevice/spot treatment” (EPA, 2015a, pp12-18), although use restrictions were imposed to try and limit exposures by children (EPA, 2015, p10; EPA, 2021, p4). As a consequence of the assessed risk to residential children after application, no exposure risk for workers was undertaken (EPA, 2015, 2015a). However to assess the residential child exposure risk, the EPA used ConsExpo and US EPA Standard Operating Procedure for assessing residential pesticide exposure that can also be used to assess adult exposures (EPA, 2015a, p15; RIVM, 2021; US EPA, 2012).

Other Approvals for bifenthrin alone (for example: HSR100739 and HSR101189) do include use on turf as a possibility.

2.83.3. Approved Substance Specific Inputs for REI Modelling

Bifenthrin:

AOEL = 0.0075 mg/kg bw/d, based on a 1-year oral study in dogs supported by a developmental study in rats, with UF = 100; and; a 50% correction for limited oral absorption (EPA, 2015a, p9 citing EFSA, 2011, p3).

Dermal Absorption (DA) = 30% for active [0.30] using the default value proposed by Aggarwal *et al.*, 2015 (EPA, 2015a, p10).

alpha-Cypermethrin:

AOEL = 0.01 mg/kg bw/d, based on 90-day oral study in dogs with UF = 100, and 45% correction for limited oral absorption (EPA, 2015a, p6 citing EFSA).

DA = 30% for active [0.30], based on default value for spray dilutions (Aggarwal *et al.*, 2015 cited in EPA, 2015a, p10).

APP202599 – *Science Memo* (EPA, 2015a, p3) indicated a maximum application rate of 150 mL Fury 120 SC per 100 m² (1200g bifenthrin/ha and 600g *alpha*-cypermethrin/ha), but this was not picked up in APP202599 – *Decision* (EPA, 2015).

US EPA Standard Operating Procedures for Residential Pesticide Exposure Assessment (2012, pp7-22 to 7-23):

Post-application dermal exposure resulting from contact with treated indoor surfaces is dependent on three exposure factors: transferable residue (TR), transfer coefficient (TC), and exposure time (ET).

TC = transfer coefficient (cm²/hr) [adult: 6,800];

ET = exposure time (hr/day) [adult, hard surfaces: 2].

If chemical-specific TR data are available, this is preferred and should be used to calculate exposure. However, if chemical-specific TR data are not available, then TR can be calculated using the following formula:

$$TR = DepR * F_{ai} \quad (7.17)$$

where:

TR = indoor surface transferable residue (µg/cm²);

DepR = deposited residue (µg/cm²), based on (in order of preference):

(1) Chemical-specific residue deposition data (µg/cm²),

(2) Application rate (lb ai/area) [broadcast (liquid formulations) use application rate: 1,200 µg/cm²], or

(3) Default residue based on type of application (µg/cm²); and

F_{ai} = fraction of ai available for transfer from carpet or hard surface (unitless) [no chemical-specific data, hard surfaces: 0.08].

2.83.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101069	Substance Name	Fury 120 SC		ACVM Register	None current		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All uses: maximum stipulated application rate in APP202599 – <i>Science Memo</i>		150 mL Fury 120 SC per 100 m ²	1200g bifenthrin/ha	See Substance Specific inputs	0.75	No data	0.0	No data

2.83.5. Notes

2.83.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2011. *Conclusion on the peer review of the pesticide risk assessment of the active substance bifenthrin*. EFSA Journal 2011;9(5):2159.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2011.2159>

EFSA, 2018. *Conclusion on the peer review of the pesticide risk assessment of the active substance alpha-cypermethrin*. EFSA Journal 2018;16(9):5403.

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5403>

EPA HSNO Classifications: *Fury 120 SC*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/4917DA4E-DB11-413A-9132-2F4230D943A8>

EPA, 2015. *Decision: APP202599*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202599/0e0a9d7d64/APP202599-APP202599-Decision-Final-V8-Approved-2015-10-15.pdf>

EPA, 2015a. *APP202599 – Fury 120 SC: Science Memo*.

EPA, 2021. *Approval for reissue: HSR101069*.

https://www.epa.govt.nz/assets/RecordsAPI/Fury_120_SC_HSR101069.pdf

RIVM, 2021. *ConsExpo*. <https://www.rivm.nl/en/consexpo>

US EPA, 2012. *Standard Operating Procedures for Residential Pesticide Exposure Assessment*.

<https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/standard-operating-procedures-residential-pesticide#sops>

2.83.7. Approved Substance ACVM Registered Label

None current (July 2021).

2.84. HSR101088: Advance Gold (123g salicylic acid/L SC)

2.84.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101088	Advance Gold	Kiwifruit	None
		All crops except: Kiwifruit	None
HSR101088 has been determined to be a <i>plant growth regulator</i> and not meet the definition of a <i>pesticide</i> – no REI can be set under Regulation 13.23 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.			

Consultation

Given the biological activities of salicylic acid:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.84.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101088 was: P009164 – Advance Gold.

The HSNO approval APP202250 – *Decision* (EPA, 2015a, p1) stated in the *Purpose of the application* that Advance Gold was a bud breaker in horticultural crops.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

In the US, salicylic acid is registered for formulation into plant growth regulator end-use products for seed treatment uses (US EPA, 2021).

2.84.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default

AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.38	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Salicylic acid:

AOEL = 0.38 mg/kg bw/d, based on read-across from acetylsalicylic acid with UF = 100 (EPA, 2015a, pp21-22).

Dermal Absorption (DA) = 30% for spray dilution [0.30] (Aggarwal et al. 2015 default values cited in EPA, 2015a, p22).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101088 – Additional controls: indicated a maximum application rate of 7400g salicylic acid/ha; 1 application/year (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

HSR101088 – Additional controls: indicated the substance must only be applied during the dormant growth period (BBCH 00) (EPA, 2021, p4).

2.84.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101088	Substance Name	Advance Gold		ACVM Register	P009164		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Kiwifruit (dormant; BBCH 00)	Bud break	Maximum 27L Advance Gold/ha [3321g salicylic acid/ha]	3321g salicylic acid/ha; 1 appl'n/year	Berries – reach/pick	2.70	0.67	14.3	0.0
All other crops: maximum stipulated		7400g a.i./ha; 1 appl'n/year	7400g a.i./ha; 1 appl'n/year	Default in absence of any data	10.42	No data	33.8	No data

application rate in HSR101088								
^a Crop growth stage only stipulated if detailed on the label.								

2.84.5. Notes

EPA (2015b, p24) states: *Advance Gold is intended to be applied to plants in the dormant stage during winter. Information from the applicant indicates that re-entry involving contact with treated plants is not generally required for 21 days unless there is a need to cut out vines infected with the kiwifruit vine disease Pseudomonas syringae pv actinidiae (Psa). Non contact re-entry is required for tasks such as weed spraying, mowing or Psa monitoring.*

For these scenarios, the EPA's quantitative approach to re-entry exposure assessment which is based on contact with residues on foliage while searching for and picking fruit is not considered relevant. On a qualitative basis, unacceptable risks are not anticipated for re-entry workers. However, as a precaution a re-entry control preventing re-entry until the spray has dried is proposed.

EPA (2015b, p4) indicates crops: kiwifruit; pipfruit; canefruit; and, grapes.

2.84.6. Approved Substance Specific References

EPA HSNO Classifications: *Advance Gold*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B88BD8A4-B61F-4F04-AEF3-5DBAEBFDE60C>

EPA, 2015. APP202250 – *Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202250/d93c5e7cdf/APP202250-APP202250-Application-Form-Final.pdf>

EPA, 2015a. APP202250 – *Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202250/4e79cdc275/APP202250-APP202250-Decision-FINAL.pdf>

EPA, 2015b. APP202250 – *Science Memo*.

EPA, 2021. *Approval for reissue: HSR101088*.

https://www.epa.govt.nz/assets/RecordsAPI/Advance_Gold_HSR101088.pdf

US EPA, 2021. EPA RN: 34704-1055. https://www3.epa.gov/pesticides/chem_search/ppls/090866-00027-20210105.pdf

2.84.7. Approved Substance ACVM Registered Label

P009164 – Advance Gold:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=55765

2.85. HSR101089: Mycotal WG (*Lecanicillium muscarium* 19-79 strain WG)

2.85.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101089	Mycotal WG	All crops	24 hours
<p>The REI for All crops was set because HSR101089 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1); HSR101089 is also classified as a respiratory sensitiser (HSNO 6.5A; GHS Resp Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of *Lecanicillium muscarium* 19-79 strain:

- a) Is there any better data available on re-entry worker activities for any existing and potential future "off label" uses?

2.85.2. Discussion

As of 6 July 2021, we were unable to match HSR101089 to any ACVM registered product with an approved label.

The HSNO approval APP202247 (EPA, 2016, p1) stated in the *Purpose of the application* that Mycotol WG was a microbial pest control agent for the control of whitefly in greenhouse crops.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

The EPA noted:

“In a recent approval a re-entry interval (REI) of 4 hours was applied based on a similar control applied by the US EPA. This was applied after recognising uncertainty associated with the metabolites present after application of a microbial pesticide control agent. In relation to Mycotol WG, EPA staff considered whether or not a REI should be applied. EPA Staff noted that:

- The active ingredient was not associated with any toxicological concerns;
- No relevant toxic metabolites are known to be present based on the production process for used for the formulated product.

EPA staff concluded that a 4 hour REI should be proposed for the product and that dermal PPE (gloves, long-sleeved shirt and long pants) should be worn for early re-entry due to the contact sensitisation hazard.” (EPA, 2016a, p113).

The EPA also acknowledged that:

“Due to the contact and respiratory sensitisation hazard associated with the product, an identification control requiring the use of PPE (gloves and overalls during mixing, loading and application) and respiratory protection (during application) has been proposed.” (EPA, 2016a, p113).

The EFSA noted that:

“It is generally accepted that no reference values (acceptable daily intake – ADI, acute reference dose – ARfD, acceptable operator exposure level – AOEL or acute acceptable operator exposure level – AAOEL) are needed in cases where the microorganism is not pathogenic or infective and does not produce toxins (which remains to be confirmed). Accordingly, no exposure risk assessment would be needed. It is noted that operators and workers are recommended to use personal protective equipment (PPE) because all microorganisms are regarded as potential sensitisers (via the dermal and inhalation routes). Considering the data gap identified for secondary metabolites/toxins except destruxins, operator and worker exposure could not be finalised – as mentioned above, the RMS considered this issue sufficiently addressed. Assuming that the product is used in high technology (permanent) greenhouses or tunnels that are closed during application and 12 hours afterwards, bystanders and residents are unlikely to be exposed to the MCA.” (EFSA, 2020, p8).

No modelling was possible.

2.85.3. Approved Substance Specific Inputs for REI Modelling

Lecanicillium muscarium 19-79 strain:

AOEL = None (EFSA, 2020, p8; EFSA, 2016, p10).

Dermal Absorption (DA) = Not applicable

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101089 – Additional controls: indicated a maximum application rate of 96g a.i./ha; 12 applications/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.85.4. Notes

HSR101089 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and a REI for All crops of at least 24 hours is recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

[Strain Ve6 appears the same as 19-79 (Assadi *et al.*, 2021
<https://ejbpc.springeropen.com/articles/10.1186/s41938-021-00395-5>)]

2.85.5. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance Akanthomyces muscarius strain Ve6, formerly Lecanicillium muscarium strain Ve6*. EFSA Journal 2020;18(6):6121.
<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2020.6121>

EPA HSNO Classifications: *Mycotal WG*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B650B705-C458-46BB-9806-FF14ED6E0467>

EPA, 2016. *Decision: APP202247*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202247/b898797fc2/APP202247-APP202247-Decision-Document-Final.pdf>

EPA, 2016a. *APP202247 – Mycotal WG: Science Memo*.

EPA, 2021. *Approval for reissue: HSR101089*.
https://www.epa.govt.nz/assets/RecordsAPI/MYCOTAL_WG_HSR101089.pdf

2.85.6. Approved Substance ACVM Registered Label

None current (July 2021).

2.86. HSR101125: DuPont Zorvec Enicade Fungicide (100g oxathiapiprolin/L OD)

2.86.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101125	DuPont Zorvec Enicade Fungicide	Bulb onions, All other crops	24 hours
<p>The REI for Bulb onions and All crops was set because HSR101125 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1); HSR101125 is also classified as a respiratory sensitiser (HSNO 6.5A; GHS Resp Sens. 1)::</p> <p>the spray must be completely dry on the affected surfaces before re-entry; and,</p> <p>waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of oxathiapiprolin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.86.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101125 was: P009225 – DuPont Zorvec Enicade Fungicide.

The HSNO approval APP202567 – *Decision* (EPA, 2016, p1) stated in the *Purpose of the application* that DuPont Zorvec Enicade Fungicide was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.86.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.31	Substance specific
DA = dermal absorption (expressed as a proportion)	0.007	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Oxathiapiprolin:

AOEL = 0.31 mg/kg bw/d, based on a multigeneration toxicity study in rats with UF = 100, with a 30% correction for limited oral absorption (EPA, 2016a, p377 citing EFSA, 2005).

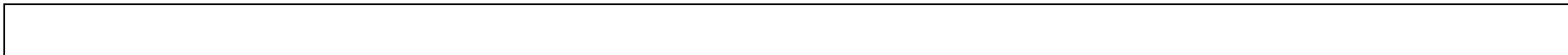
Dermal Absorption (DA) = 0.7% for spray dilutions [0.007], based on “triple pack” data for a 100 g/L OD formulation (EPA, 2016a, p378).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101125 – Additional controls: indicated a maximum application rate of 35g oxathiapiprolin/ha; 2 applications/year; 10-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.86.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101125	Substance Name	DuPont Zorvec Enicade Fungicide		ACVM Register	P009225		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Bulb onions	Downy mildew	350 mL/ha; 2 appl'n/year; 10-day interval	35g a.i./ha; 2 appl'n/year; 10-day interval	Vegetables – Reach/Pick	0.00	0.00	0.0	0.0
All other crops: maximum stipulated application rate in HSR101125		35g a.i./ha; 2 appl'n/year; 10-day interval	35g a.i./ha; 2 appl'n/year; 10-day interval	Default in absence of any data	0.00	No data	0.0	No data



2.86.5. Notes

HSR101125 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and a REI for Bulb onions and All crops of at least 24 hours is recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

2.86.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2016. *Peer review of the pesticide risk assessment of the active substance oxathiapiprolin*. EFSA Journal 2016;14(7):4504.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2016.4504>

EPA HSNO Classifications: *DuPont Zorvec Enicade Fungicide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/842B4972-30EC-4D96-A686-CC67260E4A1B>

EPA, 2016. *APP202567 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202567/33b82fa7f2/APP202567-APP202567-Decision-Zorvec-Enicade-FINAL.pdf>

EPA, 2016a. *APP202567 – DuPont Zorvec Enicade Fungicide: Science Memo*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202567/dfc513f34d/APP202567-APP202567-Staff-Report-Final.pdf>

EPA, 2021. *Approval for reissue: HSR101125*.

https://www.epa.govt.nz/assets/RecordsAPI/DuPont_Zorvec_Enicade_Fungicide_HSR101125.pdf

2.86.7. Approved Substance ACVM Registered Label

P009225 – Zorvec Enicade:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=51454

2.87. HSR101142: Timorex Gold (222.5g tea tree oil/L EC)

2.87.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101142	Timorex Gold	Grapes; Kiwifruit	24 hours ^a
		All other crops except: Grapes; Kiwifruit	7 days
<p>The REIs for Grapes and Kiwifruit were set because HSR101142 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1).</p> <p>The REI for All other crops was based on the calculated RQ.</p> <p>^a the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of tea tree oil:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.87.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101142 was: P009392 – Timorex Gold.

The HSNO approval APP202590 – *Decision* (EPA, 2016a, p1) stated in the *Purpose of the application* that Timorex Gold was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

APP202590 *Science Memo* (2016b, p63) noted that the constituents of tea tree oil were volatile, and that substantial volatilisation from plant and soil surfaces could occur in the first 24 hours after application.

EFSA (2018, p4) noted the lack of worker exposure assessment, although considered relevant to applications in permanent greenhouse structures.

2.87.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default

AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.30	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Tea tree oil:

AOEL = 0.3 mg/kg bw/d, based on an EU DAR (EPA, 2016b, p59).

Dermal Absorption (DA) = 30% for active [0.30], default value (Aggarwal *et al.*, 2015 cited in ERMA, 2016b, p61).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101142 – Additional controls: indicated a maximum application rate of 450g tea tree oil/ha; 8 application/year; 10-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.87.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101142	Substance Name	Timorex Gold		ACVM Register	P009392		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Grapes	Powdery mildew	0.5-2.0 L/ha; 4 appl'n/season; 10-14 day interval	450g a.i./ha; 4 appl'n/year; 10-day interval	Berries – Reach/Pick	0.87	0.22	0.0	0.0
Kiwifruit	Sclerotinia	1.5 L/ha; 2 appl'n/season	334g a.i./ha; 2 appl'n/year; 10-day interval	Berries – Reach/Pick	0.52	0.13	0.0	0.0

All other crops: maximum stipulated application rate in HSR101142		450g a.i./ha; 8 appl'n/year; 10- day interval	450g a.i./ha; 8 appl'n/year; 10- day interval	Default in absence of any data	1.60	No data	6.8	No data

2.87.5. Notes

HSR101142 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and REIs for Grapes and Kiwifruit of at least 24 hours are recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

2.87.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2012. *Conclusion on the peer review of the pesticide risk assessment of the active substance extract from tea tree*. EFSA Journal 2012;10(2),2542.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2542>

EFSA, 2018. *Outcome of the consultation with Member States, the applicant and EFSA on the pesticide risk assessment for extract from tea tree in light of confirmatory data*. EFSA Supporting publication 2018:EN-1407. <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/sp.efsa.2018.EN-1407>

EPA HSNO Classifications: *Timorex Gold*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/7B840D13-D61F-47A5-952F-0C521D4B59E2>

EPA, 2016. *APP202590 – Application Form: Timorex Gold*

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202590/ca71a4aa96/APP202590-APP202590-Application-form.pdf>

EPA, 2016a. *APP202590 – Decision: Timorex Gold*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202590/ad56963af3/APP202590-APP202590-Decision-FINAL-02-06-16.pdf>

EPA, 2016b. *APP202590 Science Memo*.

EPA, 2021. *Approval for reissue: HSR101142*.

https://www.epa.govt.nz/assets/RecordsAPI/Timorex_Gold_HSR101142.pdf

2.87.7. Approved Substance ACVM Registered Label

P009392 – Timorex Gold:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=47471

2.88. HSR101144: Abba (18g abamectin/L EC)

2.88.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101144	Abamet (new formulation 2)	Tomatoes (indoor)	48 hours ^a
		Strawberries	6 days
		Apples and Pears (Pipfruit)	8 days
		Avocados	14 days
		All crops except: Kiwifruit; Potatoes; Tomatoes (indoor); Strawberries; Apples, Pears; Avocados	21 days
^a For indoor scenarios, the REI applies once ventilation is complete.			

Consultation

Given the biological activities of abamectin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.88.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101144 was: P008448 – Abba.

The HSNO approval APP202814– *Decision* (EPA, 2016a, p1) stated in the *Purpose of the application* that Abba was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

The label claims for Abba are similar to those for Abamet (HSR101034), except for ornamentals.

2.88.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling abamectin		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific

DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Abamectin:

AOEL = 0.0025 mg/kg bw/d (EPA, 2014, p59).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2014, p60).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101144 – Additional controls: indicated a maximum application rate of 27g abamectin/ha; 4 applications/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.88.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101144	Substance Name	Abba (new formulation 2)		ACVM Register	P008448		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples and Pears (Pipfruit)	European Red Mite, Two-spotted Mite	37.5 mL/100L; max. 2000L spray mix/ha; do not exceed 1.5 L/ha; only 1 appl'n per season	27g a.i./ha	Fruits (from trees) – search/reach/pick	1.67	0.83	7.4	0.0

Avocados	Six-spotted Mite	37.5 mL/100L; max. 3/season; interval 14-28 days	27g a.i./ha; 3 appl'n/season; 14-day interval	Fruits (from trees) – search/reach/pick	2.54	1.27	13.4	3.4
Tomatoes (indoor)	Two-spotted Mite, Tomato russet mite	60-90 mL/100L; max. 3 appl'n/season; 7-10 day interval	16.2g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.11	0.23	1.5	0.0
Kiwifruit	Leafrollers	25 mL/100L; 3 appl'n/season; 14-day interval	11.25g a.i./ha; 3 appl'n/season; 14-day interval	Berries – reach/pick	0.70	0.18	0.0	0.0
Potatoes	Tomato-potato psyllid	600 mL/ha; max. 4 appl'n/season; 7-day interval	10.80g a.i./ha; 4 appl'n/season; 7-day interval	Vegetables – reach/pick	0.82	0.17	0.0	0.0
Strawberries	Two-spotted Mite	100 mL/100L; max. 3 appl'n/season;	18g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.48	0.37	5.6	0.0

		7-10 day interval						
All other crops: maximum stipulated application rate in HSR101144		27g a.i./ha; 4 appl'n; 7-day interval	27g a.i./ha; 4 appl'n/season; 7-day interval	Default in absence of any data	4.29	No data	21.0	No data

2.88.5. Notes

GAP data from *APP202814 – Application* (EPA, 2016, pp16-20).

EPA cross-referenced HSR101003 – Solvigo (EPA, 2014).

The vapour pressure of abamectin was reported to be negligible (Pohanish, 2014).

2.88.6. Approved Substance Specific References

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance abamectin*. EFSA Journal 2020;18(8):6227. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6227>

EPA HSNO Classifications: *Abba (new formulation 2)*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/BABEB89E-DA0B-4615-8446-2A07A01D556C>

EPA, 2014. *APP201999 – Staff Evaluation Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/89e939b78d/APP201999-APP201999-Staff-Evaluation-and-Review-Report.pdf>

EPA, 2016. *APP202814 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202814/2009dfc181/APP202814-APP202814-Application-form-Final-22April2016.pdf>

EPA, 2016a. *APP202814 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202814/5f3d13245c/APP202814-APP202814-Decision-FINAL-8June2016.pdf>

EPA, 2016b. *APP202814 – Abba Science Memo*.

EPA, 2021. *Approval for reissue: HSR101144*.

https://www.epa.govt.nz/assets/RecordsAPI/Abba_new_formulation_2_HSR101144.pdf

Pohanish, R., 2014 *“Stittig’s Handbook of Pesticides and Agricultural Chemicals 2nd Edition.”*

2.88.7. Approved Substance ACVM Registered Label

P008448 – Abba:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53608

2.89. HSR101178: Brevis (150g met amitron/L SG)

2.89.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101178	Brevis	Apples and Pears	None
		All crops except: Apples, Pears	None

Consultation

Given the biological activities of met amitron:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.89.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101178 was: P009397 – Brevis.

The HSNO approval APP202968 (EPA, 2016, p1) stated in the *Purpose of the application* that Brevis was a plant growth regulator. The active ingredient metamitron is purposed as an herbicide or as a plant growth regulator in various Approvals.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.89.3. Approved Substance Specific Inputs for REI Modelling

Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	1.3	Substance specific
n = number of applications	-	-
k = rate constant for foliar dissipation	-	-
i = interval between applications (days)	-	-
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	0.89	Substance specific
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.036	Substance specific
DA = dermal absorption (expressed as a proportion)	0.20	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Metamitron:

AOEL = 0.036 mg/kg bw/d (EPA Science Memo for HSR100598, Goltix Uno (2011a, p29) citing EFSA (2008)).

Dermal Absorption (DA) = 20% for active [0.20] (EPA Science Memo for HSR100598, Goltix Uno (2011a, p27) citing EFSA (2008)).

Dislodgeable Foliar Residue (DFR) = 0.89 µg/cm²/kg ai/ha (APP202968 used Meteor (HSR101023; 700g metamitron/kg WDG; EPA, 2019) as a reference substance, which used substance specific DFR values for apple leaves).

Multiple application factor (MAF) = 1.3 (EPA, 2019, p18).

Foliar DT₅₀ = 3 days (EPA, 2019, p17).

k = 0.231 d⁻¹ (EPA, 2019, p18).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR10178– Additional controls: indicated a maximum application rate of 330g metamitron/ha; 2 applications/year; 5-day interval (EPA, 2021a, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.89.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101178	Substance Name	Brevis		ACVM Register	P009397		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples, Pears [king fruitlets 8-14mm in diameter]	Crop thinning	1.1 to 2.2 kg/ha; if low rate used 2 appl'n/year; 5-day interval; no more than 2.2 kg/ha per year	330g a.i./ha; 2 appl'n/year; 5-day interval	Fruits (from trees) – search/reach/pick	0.84	0.42	0.0	0.0

All other crops: maximum stipulated application rate in HSR101178 – Additional Controls		330g a.i./ha; 2 appl'n/year; 5- day interval	330g a.i./ha; 2 appl'n/year; 5- day interval	Default in absence of any data	0.97	No data	0.0	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.89.5. Notes

EPA has used different dermal absorption values for met amitron in different approvals – see HSR100598 – Goltix Uno Herbicide: *Notes*.

2.89.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2008. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance met amitron*. EFSA Scientific Report (2008) 185, 1-95.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2008.185r>

EPA HSNO Classifications: *Brevis*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/D2CF9E68-0226-4BE0-A193-52407FB81F2F>

EPA, 2011a. *APP201004 Goltix Uno Herbicide: Science Memo*.

EPA, 2016. *Decision: APP202968*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202968/91c8f69c49/APP202968-APP202968-Decision-FINAL-20-09-2016.pdf>

EPA, 2019. *APP203786 Staff Report (Meteor)*. https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203786/APP203786_Staff_Report.pdf

EPA, 2021. *APP204060 Modified Approval – Brevis*. https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP204060/Modified_Approval_Brevis_HSR101178.pdf

EPA, 2021a. *Approval for reissue: HSR101178*.

https://www.epa.govt.nz/assets/RecordsAPI/Brevis_HSR101178.pdf

2.89.7. Approved Substance ACVM Registered Label

P009397 – Brevis:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=46145

2.90. HSR101179: Elatus Plus (100g benzovindiflupyr/L EC)

2.90.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101179	Elatus Plus	Wheat, Ryegrass seed crops	24 hours
		All crops except: Wheat, Ryegrass seed crops	24 hours
<p>The REIs for Wheat, Ryegrass seed crops and All crops were set because HSR101179 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of benzovindiflupyr:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.90.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101179 was: P009276 – Elatus Plus.

The HSNO approval APP202679 – *Decision* (EPA, 2016, p1) stated in the *Purpose of the application* that Elatus Plus was a fungicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.90.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.04	Substance specific
DA = dermal absorption (expressed as a proportion)	0.03	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Benzovindiflupyr (Solatenol):

AOEL = 0.04 mg/kg bw/d, based on a 2-generation reproductive toxicity study in rats, supported by a 13-week neurotoxicity study in rats, with UF = 100, with a 60% correction for limited oral absorption (EPA, 2016a, p332 citing EFSA, 2015, p9).

Dermal Absorption (DA) = 3% for active [0.03], based on submitted data for representative 100 g/L EC formulations of benzovindiflupyr (EPA, 2016a, p333 citing EFSA, 2015, p9).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101179 – Additional controls: indicated a maximum application rate of 750 mL/ha (75g benzovindiflupyr/ha); 2 applications/year; 14-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.90.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101179	Substance Name	Elatus Plus		ACVM Register	P009276		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Wheat (not after end of flowering)	Glume Blotch, Leaf Rust, Speckled Leaf Blotch, Stripe Rust	750 mL/ha; no more than 2 appl'n/season	75g a.i./ha; 2 appl'n/year; 14-day interval	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.03	No data	0.0	No data
Ryegrass seed crops	Stem rust, Crown rust	750 mL/ha; no more than 2 appl'n/season	75g a.i./ha; 2 appl'n/year; 14-day interval	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.03	No data	0.0	No data

All other crops: maximum stipulated application rate in HSR101179		75g a.i. /ha; 2 appl'n/year; 14- day interval	75g a.i./ha; 2 appl'n/year; 14- day interval	Default in absence of any data	0.14	No data	0.0	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.90.5. Notes

HSR101179 has a skin sensitisation classification (HSNO 6.5B or GHS Skin Sens. 1), and the REIs for Wheat, Ryegrass seed crops and All crops of at least 24 hours are recommended to ensure the spray is completely dry on the affected surfaces, and waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.

2.90.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2015. *Peer review of the pesticide risk assessment of the active substance benzovindiflupyr*. EFSA Journal 2015;13(3):4043.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2015.4043>

EPA HSNO Classifications: *Elatus Plus*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/3CDD3D6C-C51E-4F20-A1B0-8F069421139D>

EPA, 2016. *APP202679 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202679/3d6cb9aa50/APP202679-APP202679-Decision-FINAL.pdf>

EPA, 2016a. *APP202679 – Elatus Plus: Science Memo*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202679/90fdd47ac2/APP202679-APP202679-Sciencememo-FINAL-EXTERNAL.pdf>

EPA, 2016b. *APP202679 – Elatus Plus: Controls*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202679/bc64d91e10/APP202679-app202679Controlsappendixa.pdf>

EPA, 2021. *Approval for reissue: HSR101179*.

https://www.epa.govt.nz/assets/RecordsAPI/Elatus_Plus_HSR101179.pdf

2.90.7. Approved Substance ACVM Registered Label

P009276 – Elatus Plus:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=54852

2.91. HSR101186: Metafol 700 SC (700g met amitron/L SG)

2.91.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101186	Metafol 700 SC	Beets	9 days
		All crops except: Beets	20 days

Consultation

Given the biological activities of met amitron:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.91.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101186 was: P009245 – Metafol SC.

The HSNO approval APP202773 (EPA, 2016, p1) stated in the *Purpose of the application* that Metafol 700 SC was a foliar herbicide. The active ingredient metamitron is purposed as an herbicide or as a plant growth regulator in various Approvals.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

P009245 – Metafol SC also has a label claim for pre-emergence weed control that was not modelled.

2.91.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling metamitron		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.036	Substance specific

DA = dermal absorption (expressed as a proportion)	0.0186	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Metamitron:

AOEL = 0.036 mg/kg bw/d (EPA, 2016a, p10 citing EFSA, 2008).

Dermal Absorption (DA) = 1.86% for active [0.0186], based on submitted 2010 *in vitro* data for formulation Metafol 700 SC (EPA, 2016a, p11).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101186 – Additional controls: indicated a maximum application rate of 4200 g metamitron/ha; 1 application/year (EPA, 2021a, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.91.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101186	Substance Name	Metafol 700 SC		ACVM Register	P009245		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Fodder Beet, Sugar Beet, Red Beet [Post-emergence]	Broadleaf weeds	6 L/ha; no more than 6 L/ha per season or 1 appl'n per year	4200g a.i./ha; 1 appl'n/year	Vegetables – reach/pick	1.86	0.39	9.0	0.0
All other crops: maximum stipulated		4200g a.i./ha; 1 appl'n/year	4200g a.i./ha; 1 appl'n/year	Default in absence of any data	3.87	No data	19.5	No data

application rate in HSR101186								
^a Crop growth stage only stipulated if detailed on the label.								

2.91.5. Notes

EPA has used different dermal absorption values for met amitron in different approvals – see HSR100598 – Goltix Uno Herbicide: *Notes*.

2.91.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2008. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance met amitron*. EFSA Scientific Report (2008) 185, 1-95.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2008.185r>

EPA HSNO Classifications: *Metafol 700 SC*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5538BEC0-6D22-44A2-BC59-F548193248EA>

EPA, 2016. *Decision: APP202773*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202773/0ad6f4340d/APP202773-APP202773-FINAL-decision-2016-10-14.pdf>

EPA, 2016a. *APP202773 Metafol 700 SC: Science Memo*.

EPA, 2021. *APP204060 Modified Approval – Metafol 700 SC*.

https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP204060/Modified_Approval_Metafol_700_SC_HSR101186.pdf

EPA, 2021a. *Approval for reissue: HSR101186*.

https://www.epa.govt.nz/assets/RecordsAPI/Metafol_700_SC_HSR101186.pdf

2.91.7. Approved Substance ACVM Registered Label

P009245 – Metafol SC:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53031

2.92. HSR101189: Enviromax Bifenthrin 100 SC (100g bifenthrin/L SC)

2.92.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101189	Enviromax Bifenthrin 100 SC	All crops	78 days
<p>The REI for All crops was based on the calculated RQ.</p> <p>HSR101189 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p>			

Consultation

Given the biological activities of bifenthrin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.92.2. Discussion

As of 6 July 2021, we were unable to match HSR101189 to any ACVM registered product with an approved label.

The HSNO approval APP202917 (EPA, 2016, p1) stated in the *Purpose of the application* that Enviromax Bifenthrin 100 SC was a termiticide and insecticide to treat timber structures, domestic and commercial, and for use on turf and ornamental plants.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

2.92.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0075	Substance specific
DA = dermal absorption (expressed as a proportion)	0.35	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Bifenthrin:

AOEL = 0.0075 mg/kg bw/d, based on a 90-day neurotoxicity study and a 1-year toxicity study in dogs with UF = 100, and 50% correction for limited oral absorption ((EPA, 2012a, p6) citing EFSA, 2011, p3).

Dermal Absorption (DA) = 35% for active [0.35] based on data for aqueous dilution in an *in vitro* human study with representative formulation, Talstar 8 SC [80g bifenthrin/L] (EPA, 2012a, p6 citing EFSA, 2011, p15).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). APP202917 – Controls, E2 (EPA, 2016, p11) Additional controls: Application rate (EPA, 2016, p16) indicated a maximum application rate of 4.4 L/ha (440g bifenthrin/ha); 4 applications/year; 14-day interval. [HSR101189 did not stipulate a rate, only 4 applications/year; 14-day interval (EPA, 2021, p3)].

The Transfer Coefficient for “Turf - Transplanting, Hand weeding” (20,000 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.92.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101189	Substance Name	Enviromax Bifenthrin 100 SC		ACVM Register	None current		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in APP202917 – Additional Controls		4.4 L/ha; 4 appl'n/year; 14-day interval	440g a.i./ha; 4 appl'n/year; 14-day interval	Turf - Transplanting, Hand weeding	222.03	No data	77.9	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.92.5. Notes

The EPA assessment of HSR101189 used the modelling on HSR100739 that calculated a RQ of 10.36 as the outcome of the re-entry worker exposure assessment (EPA, 2012a, p7). The discrepancy with the RQ calculated above (222.03) may, in part, be due to different dermal absorption (DA) values used: 35% *cf* 3%, and transfer coefficient (TC) values. A DA of 35% was used here, following the EFSA Guidance document (2014): *For the dermal absorption percentage to be used for the assessment of worker, resident and bystander exposure towards surface deposits, the higher of the values for the undiluted product and the in-use dilution should be used. The use of higher dermal absorption is based on the precautionary principle as no measured values for dried residues after application of dilutions are available.* A TC value of 20,000 for *Turf - Transplanting, Hand weeding* was used here, based on the uses in the *Purpose of the application*.

2.92.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2011. *Conclusion on the peer review of the pesticide risk assessment of the active substance bifenthrin.* EFSA Journal 2011;9(5):2159.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2011.2159>

EPA HSNO Classifications: *Enviromax Bifenthrin 100 SC* <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/5A20C529-EEEE-417F-987B-2A880F049295>

EPA, 2016. *Decision: APP202917.* <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202917/9a33588cfd/APP202917-APP20917-Rapid-decision-V5-CE-review-2016-10-07.pdf>

EPA, 2012a. *APP201428 – Brigade T&O 100 g/L SC: Science Memo.*

EPA, 2021. *Approval for reissue: HSR100588.*

https://www.epa.govt.nz/assets/RecordsAPI/Enviromax_Bifenthrin_100_SC_HSR101189.pdf

2.92.7. Approved Substance ACVM Registered Label

No current Approved Labels (July 2021).

2.93. HSR101197: Mavrik Duo

2.93.1. Recommendation

Approval Number	Substance Name	Crop	Recommended REI
HSR101197	Mavrik Duo	Cabbages; Cereals; Clover seed crops; Oilseed rape; Tomatoes (outdoor)	None
		Potatoes	3 days
		Cherries, Peaches, Plums; Nectarine	5 days
		All other crops, except: Cabbages; Cereals; Clover seed crops; Oilseed rape; Tomatoes (outdoor); Potatoes; Cherries, Peaches, Plums; Nectarine	13 days
The REI modelling was driven by tau-fluvalinate with the lower AOEL.			

Consultation

Given the biological activities of pirimicarb and tau-fluvalinate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.93.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101197 was: P009373 – Mavrik Duo.

In the HSNO approval APP201045 – *Consultation Report* (EPA, 2012, p29) pirimicarb is included as an insecticide.

The application parameters used in the modelling for this substance were based on the label claims from the ACVM registered product. For the “All other crops” scenario, potential exposures were modelled on the highest application rate found on the approved labels of similar substances.

2.93.3. Approved Substance Specific Inputs for REI Modelling

See modelling inputs for HSR000703.

tau-Fluvalinate:

AOEL = 0.0044mg/kg bw/d, based on a 90-day phase of a chronic study in rats, with a UF of 100 and corrected for 44% oral absorption modelled here (EFSA, 2010, p8).

Dermal absorption (DA) = 3.09% (0.0309), based on 3-pack data from Mavrik formulations (EFSA, 2010, p27).

2.93.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101197	Substance Name	Mavrik Duo		ACVM Register	P009373 – Mavrik Duo		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Cabbages	Aphids	2.5L/ha; 10-14 day intervals	125g pirimicarb/ha; 4 appl'n; 7-day interval [Bra 5] ^{a,b}	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
			45g tau-fluvalinate /ha; 4 appl'n; 7-day interval		0.60	0.13	0.0	0.0

Cereals	Cereal aphid, Rose grain aphid	1-2L/ha; Max. 2 appl'n; 14-day intervals	100g pirimicarb/ha; 4 appl'n; 7-day interval [Ara 14] _{a,c}	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.20	NA	0.0	NA
			36g tau- fluvalinate /ha; 4 appl'n; 7-day interval		0.19	NA	0.0	NA
Cherries, Peaches, Plums	Black cherry, Leaf curl plum, Green peach aphids	250mL/100L water: Min. 2000L/ha	250g a.i./ha; 3 appl'n; 18-day interval [StF 10] _{a,b}	Fruit from trees – Search/Reach/Pick	1.57	0.78	3.3	0.0
Nectarines	Thrips		90g tau- fluvalinate/ha; 3 appl'n; 18-day interval		1.34	0.67	4.2	0.0
Clover seed crops	Clover casebearer moth,	2L/ha	100g pirimicarb/ha; 4 appl'n; 7-day		0.20	NA	0.0	NA

	Bluegreen lucerne aphid		interval [Ara 14] a,c	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants				
			36g tau- fluvalinate /ha; 4 appl'n; 7-day interval		0.19	NA	0.0	NA
Oilseed rape	Aphids	2L/ha	100g pirimicarb/ha; 4 appl'n; 7-day interval [Ara 14] a,c	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	0.20	NA	0.0	NA
			36g tau- fluvalinate /ha; 4 appl'n; 7-day interval		0.19	NA	0.0	NA
Potatoes	Aphids	5L/ha; 7-14 day intervals	250g pirimicarb/ha; 4 appl'n; 7-day interval [Pot 3] a,c	Vegetables – Reach/Pick	1.27	0.26	1.7	0.0
			90g tau- fluvalinate/ha; 4		1.21	0.25	2.7	0.0

			appl'n; 7-day interval					
Tomatoes (field)	Aphids	2.5L/ha; 7-14 day intervals	125g pirimicarb/ha; 4 appl'n; 7-day interval [Bra 5] ^{a,b}	Vegetables – Reach/Pick	0.63	0.13	0.0	0.0
			45g tau-fluvalinate /ha; 4 appl'n; 7-day interval		0.60	0.13	0.0	0.0
All crops: highest application rate found on approved labels			500g a.i./ha; 4 appl'n; 7-day interval	Default in absence of any data	5.27	No data	12.2	No data
^a Application rate from relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i> ; ^b Label (non-critical) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>]; ^c Industry source: Critical (rate=label) [relevant EPA, 2012. APP201045: <i>Summary and Analysis Report</i>].								

2.93.5. Notes

2.93.6. Approved Substance Specific References

EFSA, 2010. *Conclusion on the peer review of the pesticide risk assessment of the active substance tau-fluvalinate*. EFSA Journal 2010; 8(7):1645.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2010.1645>

EPA HSNO Classifications: HSR101197. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/82151E1B-23B9-408C-8470-E7A3F44C0507>

EPA, 2012a. *Consultation Report: APP201045 – Organophosphate and carbamate plant protection insecticides*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/c306354078/APP201045-Consultation-Report.pdf>

EPA, 2013. *APP201045 – Application for the Reassessment of a Group of Hazardous Substances – Controls Annex*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201045/a230414124/APP201045-APP202142-Controls-Appendix-Full-OPC-controls-2015-08-19.pdf>

2.93.7. Approved Substance ACVM Registered Label

P009373 – Mavrik Duo

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&searchAcvm_WAR_aaol_action=document&searchAcvm_WAR_aaol_form-submit=true&searchAcvm_WAR_aaol_documentId=50619

2.94. HSR101211: Tina Miticide and Insecticide (18g abamectin/L EC)

2.94.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101211	Tina Miticide and Insecticide	Tomatoes (indoor)	48 hours ^a
		Strawberries	6 days
		Apples and Pears (Pipfruit)	8 days
		Avocados	14 days
		All crops except: Kiwifruit; Potatoes; Ornamentals; Tomatoes (indoor); Strawberries; Apples, Pears; Avocados	21 days
^a For indoor scenarios, the REI applies once ventilation is complete.			

Consultation

Given the biological activities of abamectin:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.94.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101211 was: P009454 – Tina Miticide and Insecticide.

The HSNO approval APP202877 – *Decision* (EPA, 2017a, p1) stated in the *Purpose of the application* that Tina Miticide and Insecticide was an insecticide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

The label claims for Tina Miticide and Insecticide are similar to those for Abamet (HSR101034).

2.94.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling abamectin		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0025	Substance specific

DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Abamectin:

AOEL = 0.0025 mg/kg bw/d (EPA, 2014, p59; 2016, p19).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2014, p60).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101211 – Additional controls: indicated a maximum application rate of 27g abamectin/ha; 4 applications/year; 7-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.94.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101211	Substance Name	Tina Miticide and Insecticide		ACVM Register	P009454		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Apples and Pears (Pipfruit)	European Red Mite, Two-spotted Mite	37.5 mL/100L; max. 2000L spray mix/ha; do not exceed 1.5 L/ha; only 1 appl'n per season	27g a.i./ha	Fruits (from trees) – search/reach/pick	1.67	0.83	7.4	0.0
Kiwifruit	Leafrollers	25 mL/100L; 3 appl'n/season;	11.25g a.i./ha; 3	Berries – reach/pick	0.70	0.18	0.0	0.0

		14-day interval; not within 120 days of harvest	appl'n/season; 14-day interval					
Strawberries	Two-spotted Mite	100 mL/100L; max. 3 appl'n/season; 7-10 day interval	18g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.48	0.37	5.6	0.0
Ornamental plants including roses, Chrysanthemums, Carnations, indoor foliage plants	Two-spotted Mite	25-50 mL/100L; max. 3 appl'n/season; 7-10 day interval	9g a.i./ha; 3 appl'n/season; 14-day interval	Ornamentals – cut/sort/bundle/carry	0.94	0.26	0.0	0.0
Potatoes	Tomato-potato psyllid	600 mL/ha; max. 4 appl'n/season; 7-day interval	10.80g a.i./ha; 4 appl'n/season; 7-day interval	Vegetables – reach/pick	0.82	0.17	0.0	0.0

Indoor Tomatoes	Two-spotted Mite, Tomato russet mite	60-90 mL/100L; max. 3 appl'n/season; 7-10 day interval	16.2g a.i./ha; 3 appl'n/season; 7-day interval	Berries – reach/pick	1.11	0.23	1.5	0.0
Avocados	Six-spotted Mite	37.5 mL/100L; max. 3/season; interval 14-28 days	27g a.i./ha; 3 appl'n/season; 14-day interval	Fruits (from trees) – search/reach/pick	2.54	1.27	13.4	3.4
All other crops: maximum stipulated application rate in HSR101034		27g a.i./ha; 4 appl'n; 7-day interval	27g a.i./ha; 4 appl'n/season; 7-day interval	Default in absence of any data	4.29	No data	21.0	No data

2.94.5. Notes

GAP data from *APP202877 – Application* (EPA, 2016, pp15-19).

EPA cross-referenced HSR101003 – Solvigo (EPA, 2014).

The vapour pressure of abamectin was reported to be negligible (Pohanish, 2014).

2.94.6. Approved Substance Specific References

EFSA, 2020. *Peer review of the pesticide risk assessment of the active substance abamectin*. EFSA Journal 2020;18(8):6227. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6227>

EPA HSNO Classifications: *Tina Miticide and Insecticide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/B11EE9C0-2502-4D91-993F-40AEDF2BEB88>

EPA, 2014. *APP201999 – Staff Evaluation Report*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP201999/89e939b78d/APP201999-APP201999-Staff-Evaluation-and-Review-Report.pdf>

EPA, November 2016. *APP202877 – Tina Miticide and Insecticide Science Memo*.

EPA, 2017. *APP202877 – Application*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202877/55256ad2af/APP202877-APP202877-Application-Form-FINAL-17October2016.pdf>

EPA, 2017a. *APP202877 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP202877/295a53c1e5/APP202877-APP202877-Decision-FINAL-10February2017.pdf>

EPA, 2021. *Approval for reissue: HSR101211*. https://www.epa.govt.nz/assets/RecordsAPI/Tina_Miticide_and_Insecticide_HSR101211.pdf

Pohanish, R., 2014 *“Stittig’s Handbook of Pesticides and Agricultural Chemicals 2nd Edition.”*

2.94.7. Approved Substance ACVM Registered Label

P009454:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=52132

2.95. HSR101234: Sable (69g fenoxaprop-P-ethyl/L EW)

2.95.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101234	Sable	Wheat, Barley	24 hours
		Perennial ryegrass, Pasture	24 hours
		All other crops except: Wheat, Barley; Perennial ryegrass, Pasture	25 days
<p>The REIs for Wheat, Barley; Perennial ryegrass, and Pasture were set because HSR101234 is classified as a skin sensitiser (HSNO 6.5B; GHS Skin Sens. 1): the spray must be completely dry on the affected surfaces before re-entry; and, waterproof gloves should be worn by re-entry workers in addition to appropriate work clothes.</p> <p>The REI for All other crops was based on the calculated RQ.</p>			

Consultation

Given the biological activities of fenoxaprop-P-ethyl:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.95.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101234 was: P009478 – Sable.

The HSNO approval APP203218 – *Decision* (EPA, 2017a, p1) stated in the *Purpose of the application* that Sable was an herbicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.95.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.0064	Substance specific
DA = dermal absorption (expressed as a proportion)	0.38	Substance specific

BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Fenoxaprop-P-ethyl:

AOEL = 0.0064 mg/kg bw/d, based on an EFSA assessment, and noting a 40% correction for limited oral absorption (ERMA, 2005, p20).

Dermal Absorption (DA) = 38% for active [0.38] (ERMA, 2005, p6).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101234 – Additional controls: indicated a maximum application rate of 53g fenoxaprop-P-ethyl/ha; 1 application/year (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.95.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101234	Substance Name	Sable		ACVM Register	P009478		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Wheat, Barley; Perennial ryegrass; Pasture	Weed control	750 mL/ha	52g a.i./ha; 1 appl'n/year	Cereals – Scouting, Irrigation, Weeding mature/full foliage plants	1.06	No data	0.8	No data
				Mowing	0.53	No data	0.0	No data

All other crops: maximum stipulated application rate in HSR101234		53g a.i./ha; 1 appl'n/year	53g a.i./ha; 1 appl'n/year	Default in absence of any data	5.61	No data	24.9	No data

2.95.5. Notes

[EPA cross-referenced HSR100440 – Coronet (70.5g fenoxaprop-P-ethyl/L EW) (ERMA200544)].

2.95.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2007. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance fenoxaprop-P*. EFSA Scientific Report 2007;121,1-76.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2007.121r>

EPA HSNO Classifications: *Sable*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/1FEE1278-540A-458D-B301-D4C6E1494FEA>

EPA, 2017. *APP203218 – Application Form: Sable*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203218/f43cada3bd/APP203218-APP203218-Final-Signed-Application-Form-01May17.pdf>

EPA, 2017a. *APP203218 – Decision: Sable*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203218/cc746b83df/APP203218-APP203218-Decision-v7-FINAL.pdf>

EPA, 2015. *APP203218 Science Memo*.

ERMA, 2005. *ERMA200544 – Evaluation and Review Report: Coronet*.

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200544/b82749508c/ERMA200544-E-and-R-ERMA200544.pdf>

ERMA, 2005a. *ERMA200544 Science Memo*.

EPA, 2021. *Approval for reissue: HSR101234*.

https://www.epa.govt.nz/assets/RecordsAPI/Sable_HSR101234.pdf

2.95.7. Approved Substance ACVM Registered Label

P009478 – Sable:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=52256

2.96. HSR101235: Beetron PM (100g phenmedipham/L and 300g metamitron/L SC)

2.96.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101235	Beetron PM	Beets	48 days
		All crops except: Beets	63 days

The REI modelling was driven by metamitron with the lower AOEL and higher application rate.

Consultation

Given the biological activities of metamitron and phenmedipham:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.96.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101235 was: P009463 – Beetron PM.

The HSNO approval APP203150 (EPA, 2017, p1) stated in the *Purpose of the application* that Beetron PM was an herbicide. The active ingredient metamitron is purposed as an herbicide or as a plant growth regulator in various Approvals.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

2.96.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling metamitron		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.036	Substance specific

DA = dermal absorption (expressed as a proportion)	0.75	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Metamitron:

AOEL = 0.036 mg/kg bw/d (EPA, 2016a, p10 citing EFSA, 2008).

Dermal Absorption (DA) = 75% for active [0.75], based on EFSA default values for spray dilutions containing less than 5% active ingredient (EPA (2017a, p21 citing EFSA, 2012).

Phenmedipham:

AOEL = 0.13 mg/kg bw/d, based on 90-day oral study in rats with UF = 100 (EFSA, 2018, p10).

Dermal Absorption (DA) = 2.5% for active [0.025] (EFSA, 2018, p10).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101235 – Additional controls: indicated a maximum application rate of 300g phenmedipham/ha and 900g metamitron/ha; 4 applications/year (EPA, 2021a, p3). The 7-day interval was selected based on the label claims for Beetron PM.

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

The REI modelling was driven by metamitron with the lower AOEL and higher dermal absorption.

2.96.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101235	Substance Name	Beetron PM			ACVM Register	P009463	
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Fodder Beet, Beetroot, Sugar Beet	Broadleaf weeds	1.5-2.5 L/ha; 4 appl'n/year; 7-14 day interval; no more than 7.5 L/ha per season	250g phenmedipham /ha; 3 appl'n/year; 7-day interval	Vegetables – reach/pick	0.08	0.02	0.0	0.0
			750g met amitron/ha; 3 appl'n/year; 7-day interval		26.71	5.56	47.4	24.7

All other crops: maximum stipulated application rate in HSR101235	300g phenmedipham /ha; 4 appl'n/year; 7- day interval	300g phenmedipham/ha; 4 appl'n/year; 7- day interval	Default in absence of any data	0.23	No data	0.0	No data
	900g metamitron/ha; 4 appl'n/year; 7- day interval	900g metamitron/ha; 4 appl'n/year; 7-day interval		74.47	No data	62.2	No data

2.96.5. Notes

EPA has used different dermal absorption values for met amitron in different approvals – see HSR100598 – Goltix Uno Herbicide: *Notes*.

2.96.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2008. *Conclusion regarding the peer review of the pesticide risk assessment of the active substance met amitron*. EFSA Scientific Report (2008) 185, 1-95.

<https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2008.185r>

EFSA, 2018. *Peer review of the pesticide risk assessment of the active substance phenmedipham*. EFSA Journal 2018;16(1):5151

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5151>

EPA HSNO Classifications: *Beetron PM*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/AA3D6D24-DDAF-4615-BD2A-3F1D0A5DE6E2>

EPA, 2017. *Decision: APP203150*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203150/d436680c70/APP203150-APP203150-Final-Decision.pdf>

EPA, 2017a. *APP203150 – Beetron PM Science Memo*.

EPA, 2021. *APP204060 Modified Approval – Beetron PM*. https://epa.govt.nz/assets/FileAPI/hsno-ar/APP204060/Modified_Approval_Beetron_PM_HSR101235.pdf

EPA, 2021a. *Approval for reissue: HSR101235*.

https://www.epa.govt.nz/assets/RecordsAPI/Beetron_PM_HSR101235.pdf

2.96.7. Approved Substance ACVM Registered Label

P009463 – Beetron PM:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=53950

2.97. HSR101238: Ethosin 500SC (500g ethofumesate/L SC)

2.97.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101238	Ethosin 500SC	Beets	None
		All crops except: Beets	None

Consultation

Given the biological activities of ethofumesate:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.97.2. Discussion

As of 6 July 2021, the only ACVM registered product with an approved label for HSR101238 was: P009366 – Ethosin.

The HSNO approval APP203024 – *Decision* (EPA, 2017, p1) stated in the *Purpose of the application* that Ethosin was an herbicide.

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval, and the label claims on the approved label.

P009366 – Ethosin also has a label claim for pre-emergence weed control that was not modelled.

2.97.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default
i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	3	Default
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	2.5	Substance specific

DA = dermal absorption (expressed as a proportion)	0.10	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Ethofumesate:

AOEL = 2.5 mg/kg bw/d, based on a 90-day toxicity study in dogs, with UF = 100 (EPA, 2011a, p29 citing EFSA, 2008).

Dermal Absorption (DA) = 10% for active [0.10] (EPA, 2011a, p27).

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101238 – Additional controls: indicated a maximum application rate of 310g ethofumesate/ha; 3 applications/year; 5-day interval (EPA, 2021, p3).

The Transfer Coefficient for “Default in absence of any data” (5,200 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.97.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101238	Substance Name	Ethosin 500SC		ACVM Register	P009366		
Crop ^a	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
Red Beet (Beetroot) [Post-emergence]	Weed control	4 L/ha	2000g a.i./ha	Vegetables – reach/pick	0.07	0.01	0.0	0.0
Fodder Beet [Post-emergence]	Weed control	2 L/ha; 2 appl'n; 10-14 day interval	1000g a.i./ha; 2 appl'n; 10-day interval	Vegetables – reach/pick	0.05	0.01	0.0	0.0

All other crops: maximum stipulated application rate in HSR101238		310g a.i./ha; 3 appl'n/year; 5- day interval	310g a.i./ha; 3 appl'n/year; 5- day interval	Default in absence of any data	0.05	No data	0.0	No data
^a Crop growth stage only stipulated if detailed on the label.								

2.97.5. Notes

[EPA cross-referenced HSR100598 – Goltix Uno Herbicide (350g met amitron/L and 150 g ethofumesate/L SC): the *Science Memo* indicated a maximum application rate of 0.3078 kg ethofumesate/ha and 0.7142 kg met amitron/ha, 3 applications per year, 5-day interval (control code E2 for a class 9 substance applied to an area with an EEL set)].

2.97.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

EFSA, 2016. *Peer review of the pesticide risk assessment of the active substance ethofumesate*. EFSA Journal 2016;14(1):4374. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2016.4374>

EPA HSNO Classifications: *Ethosin 500SC*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/26338B16-C7D4-4310-9F6F-F7DBDA9C31A2>

EPA, 2011a. *APP201004 Goltix Uno Herbicide: Science Memo*.

EPA, 2017. *APP203024 – Decision*. <https://www.epa.govt.nz/assets/FileAPI/hsno-ar/APP203024/3e0f8f3c91/APP203024-APP203024-Decision-FINAL-31May2017.pdf>

EPA, 2017a. *APP203024 – Ethosin 500SC: Science Memo*.

EPA, 2021. *Approval for reissue: HSR101238*.

https://www.epa.govt.nz/assets/RecordsAPI/Ethosin_500SC_HSR101238.pdf

2.97.7. Approved Substance ACVM Registered Label

P009366 – Ethosin:

https://eatsafe.nzfsa.govt.nz/web/public/acvm-register?p_p_id=searchAcvm_WAR_aaol&p_p_lifecycle=0&p_p_state=exclusive&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&_searchAcvm_WAR_aaol_action=document&_searchAcvm_WAR_aaol_form-submit=true&_searchAcvm_WAR_aaol_documentId=44132

2.98. HSR101240: Barricade (480g prodiamine/L SC)

2.98.1. Recommendation

Approval Number	Substance Name / Definition	Crop	Recommended REI
HSR101240	Barricade A12333G Herbicide	All crops	26 days

Consultation

Given the biological activities of prodiamine:

- a) Is there any better data available on re-entry worker activities for any existing and potential future “off label” uses?

2.98.2. Discussion

As of 6 July 2021, we were unable to match HSR101240 to any ACVM registered product with an approved label.

Barricade label claims were for control of weeds in established turf, garden beds and nursery pots (EPA, 2017a, p7)

The application parameters used in the modelling for this substance were based on the application parameters section 77A control set by the EPA for this approval.

The US EPA *Occupational and Residential Registration Review Exposure and Risk Assessment* for prodiamine determined that:

“There were no adverse effects observed in the route-specific dermal toxicity study up to the limit dose in any tissue or organ. However, to protect against postnatal toxicity seen in the 2-generation reproduction study, the NOAEL of 14 mg/kg/day is considered from this study with a LOAEL of 166 mg/kg/day. With a 3% dermal absorption factor and a LOAEL of 166 mg/kg/day, a dermal exposure of 5500 mg/kg/day (166/0.03) is required which is unlikely and will exceed the limit dose of 1000 mg/kg/day. Therefore, a quantitative dermal assessment is not required.” (US EPA, 2010, p6).

2.98.3. Approved Substance Specific Inputs for REI Modelling

Parameters used for modelling		
Parameter	Value	Default/Substance specific
MAF = Multiple application factor:	-	-
n = number of applications	See modelling	Substance specific
k = rate constant for foliar dissipation	0.0693	Default

i = interval between applications (days)	See modelling	Substance specific
DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg a.i./ha)	0.233	Substance specific
AOEL = Acceptable occupational exposure level (mg/kg b.w./day)	0.018	Substance specific
DA = dermal absorption (expressed as a proportion)	0.30	Substance specific
BW = re-entry worker body weight (kg).	70	Default
WR = work rate per day (h/d)	8	Default

Prodiamine:

AOEL = 0.018 mg/kg bw/d, based on 90-day oral study in dogs with UF = 100 and an oral absorption factor of 36% (APVMA, 2010, p10 and cited in EPA, 2017a, p44).

Dermal Absorption (DA) = 30% for active [0.30] (EPA, 2017a, p39).

Foliar DT_{50} = 114 h [5 days] (EPA, 2017a, p45).

Soil DT_{50} = 57 days (EPA, 2017a, p32).

TTR = $0.106 \mu\text{g}/\text{cm}^2/\text{lb}$ = DFR [$0.233 \mu\text{g}/\text{cm}^2$] (EPA, 2017a, p45)

For the “All other crops” scenario, potential exposures were modelled on the maximum rate stipulated under HSNO Act 1996 Regulation 77A (control code HPC4B). HSR101240 – Additional controls: indicated a maximum application rate of 3840g carbaryl/ha; 2 applications/year; 90-day interval (EPA, 2021, p4).

The Transfer Coefficient for “Turf – Transplanting, Hand weeding” (20,000 cm²/h) was chosen as the highest justifiable TC value (EPA, 2020, pp57-58), based on the uses indicated in the Approval. “Off label” uses should occur under this maximum.

2.98.4. REI Modelling

HSNO Approved Substance								
Approval Number	HSR101240	Substance Name	Barricade A12333G Herbicide		ACVM Register	None current		
Crop	Pest	Application rate/Number appl'n/Interval	Modelled appl'n	Activity	RQ immediately after appl'n		REI (days)	
					No gloves	With gloves	No gloves	With gloves
All crops: maximum stipulated application rate in HSR101240		3840g a.i./ha; 2 appl'n/year; 90-day interval	3840g a.i./ha; 2 appl'n/year; 90-day interval	Turf – Transplanting, Hand weeding	34.08	No data	25.5	No data

2.98.5. Notes

2.98.6. Approved Substance Specific References

The references in this section are specific to this Approved Substance. References more widely relevant, for example with the process, are listed in the *Series References* section.

APVMA, 2010. *PUBLIC RELEASE SUMMARY on the Evaluation of the New Active PRODIAMINE in the Product BARRICADE TURF HERBICIDE*. <https://apvma.gov.au/sites/default/files/publication/13916-prs-prodiamine.pdf>

EPA HSNO Classifications: *Barricade A12333G Herbicide*. <https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/view/1EECFE22-D1DD-4A06-98AD-61C8968FBAD3>

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2.98.7. Approved Substance ACVM Registered Label

None current (July 2021).

3. Glossary

AAOEL	Acute Acceptable Occupational Exposure Level
ACVM	Agricultural Compounds and Veterinary Medicines
ADI	Acceptable Daily Intake
a.i.; ai	active ingredient
AOEL	Acceptable Occupational Exposure Level
AR	application rate (kg/ha)
ARfD	Acute Reference Dose
b.w.; bw; BW	body weight (kg)
d	day
DA	dermal absorption (expressed as a proportion unless percentage stipulated)
DAR	Draft Assessment Report [EU]
DFR	dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kg ai/ha)
DNT	developmental neurotoxicity
DT ₅₀	half-life
EC	emulsifiable concentrate
EFSA	European Food Safety Authority
EPA	Environmental Protection Authority
ERMA	Environmental Risk Management Authority
EU	European Union
GAP	Good Agricultural Practice
h	hour
ha	hectare
HED	Health Effects Division (part of US EPA)

HPC4B	Hazardous Property Controls Notice Part 4B
HSNO	Hazardous Substances and New Organisms
LOAEL	lowest observed adverse effect level
MAF	multiple application factor
MCA	microbial control agent
OD	oil dispersion
PPE	Personal Protective Equipment
Psa-V	virulent form of <i>Pseudomonas syringae</i> pv. <i>actinidiae</i>
REI	restricted entry interval
REWE	re-entry worker exposure ($\mu\text{g}/\text{kg}$ bw/d)
RMS	rappporteur Member State [EU]
RPE	Respiratory Protective Equipment
RQ	risk quotient
SC	suspension concentrate
SG	soluble granule
SL	soluble concentrate
TC	transfer coefficient for the activity being performed (cm^2/h)
TTR	transferable turf residue
UF	uncertainty factor
WDG	water dispersive/dispersible granule
WG	water dispersive/dispersible granule
WR	work rate per day (h/d)

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5. Appendices

5.1. Legislated Criteria

Under Regulation 13.23 of the Health and Safety at Work (Hazardous Substances) Regulations 2017, WorkSafe can set restricted entry intervals for a pesticide to protect persons from the toxic effects of the substance.

Regulation 13.1 of the Health and Safety at Work (Hazardous Substances) Regulations 2017 defines how the Regulations pertain to Class 6 and 8 substances and includes a definition of *pesticide* as used in the Regulations.

13.1 Interpretation

In this Part, unless the context otherwise requires,—

aerial application, in relation to a hazardous substance, means the application of the substance from an aircraft

application, in relation to a hazardous substance, means dropping, spreading, spraying, laying as bait, dusting, sprinkling, wiping, placing, discharging, or pouring the substance on the ground, vegetation, water, or any other thing, and apply has a corresponding meaning

application area, in relation to an area to which a hazardous substance is or is intended to be applied, means—

(a) the land that the person applying the substance owns or occupies; or

(b) the above-ground water within the boundaries of, or air above, the land owned or occupied by the person applying the substance for the period of time that the water or air remains within the boundaries of the land; or

(c) any land, air, or water within an area that a person is authorised, under any enactment, to apply the substance to; or

(d) an indoor area that the person applying the substance—

(i) owns or occupies; or

(ii) is authorised, under any enactment, to apply the substance to

application plot means the part of the application area where the substance is, or is intended to be, directly applied

pesticide—

(a) means a **class 6 substance** used for pest management to **eradicate, modify, or control organisms**—

(i) in agricultural, horticultural, or forestry activities; or

(ii) in any place that may be lawfully accessed by the public (with or without payment of a charge); but

(b) does not include—

(i) veterinary medicines, fertilisers, anti-fouling paints, timber treatment chemicals, and antisapstain chemicals; or

(ii) disinfectants or cleaning products other than when used for the treatment of microorganisms on horticultural crops

year means a calendar year.

13.23 WorkSafe may set restricted entry intervals for pesticide

WorkSafe may set restricted entry intervals for a pesticide to protect persons from the toxic effects of that substance if—

(a) the human exposure to the substance is primarily through inhalation or contact with skin; and

(b) scientific data available for the substance is sufficiently reliable to enable a restricted entry interval to be set.

[Some examples of when WorkSafe cannot set an REI are:

1. on a substance that is a plant growth regulator as it doesn't meet the definition of "pesticide"
2. if the substance is not a class 6 it doesn't meet the definition of pesticide.]

https://www.legislation.govt.nz/regulation/public/2017/0131/latest/DLM7310234.html?search=sw_096be8ed81ae6c85_13.23_25_se&p=1

5.2. Methodology

Approved Substance and Approval Number [HSR#####]

<https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/>

HSNO Application Register: Application documents [<https://www.epa.govt.nz/database-search/hsno-application-register/>]

Health and Safety at Work (Hazardous Substances) Regulations 2017 13.1 *pesticide* definition [https://www.legislation.govt.nz/regulation/public/2017/0131/latest/DLM7310234.html?search=sw_096be8ed81ae6c85_13.23_25_se&p=1]

Check for HSNO/GHS Classifications Class 6

Check that Approved Substance meets *pesticide* definition in Section 13.1

APP##### Decision and/or EPA Science Memo and/or EPA Staff Evaluation and Review Reports [<https://www.epa.govt.nz/database-search/hsno-application-register/view/APP#####>]

Check for updates and/or reassessments/reviews

New Zealand Food Safety ACVM Register for pesticide Approved Labels
<https://eatsafe.nzfsa.govt.nz/web/public/acvm-register>

Search for active or trade name then individual labels to confirm HSR#####
[HSR##### may not have any current Approved Labels; trade name may have changed since HSR##### approved]

Search Application documents APP##### for relevant, Approved Substance specific REI modelling inputs: AOEL; DA; DT₅₀; DFR; TC; crop; activity; application rates; applications per year; interval; maximum application rates; applications per year; interval under Application Parameters Control (77A)

Other sources of Approved Substance specific REI modelling inputs, if not robust

Confirm crop; activity; application rates; applications per year; interval with label claims from any Approved Labels; confirm Good Agricultural Practice (GAP) to convert amounts active per volume water to amounts active per hectare [GAP data from HSR Applications/Approvals?]

Reality check:
{Formulation type [granules]
{Application method [direct drilling]
Plant growth stage [pre=emergence]

Dermal contactable residues from application?

REI modelling
[excel
spreadsheet]

Round up REI to whole day.

For Approved Substances with multiple REIs, consider grouping crops with similar REIs into one REI at the upper band.

AS HSR#####

AS definition

Class 6 and “pesticide”

ACVM P#####

Approved Label

Label claims or 77A maximum

AS specific inputs or defaults

REI modelling

Modelling outputs

REI blocking

GHS Classifications

EFSA Guidance document (2014): *For the dermal absorption percentage to be used for the assessment of worker, resident and bystander exposure towards surface deposits, the higher of the values for the undiluted product and the in-use dilution should be used. The use of higher dermal absorption is based on the precautionary principle as no measured values for dried residues after application of dilutions are available.*

5.3. REI Modelling

The crop and pest scenarios; application rates; annual or seasonal number of applications; interval between applications were taken from the Good Agricultural Practice (GAP) data in the HSNO approval documents and, where possible the approved label for Agricultural Compounds and Veterinary Medicines (ACVM) registered products. Where there was no match between a HSNO approved pesticide and an ACVM registered product, the application rate; annual or seasonal number of applications; interval between applications were taken from the maximum stipulated in the HSNO approval decision document (Additional controls). Tasks were selected from the available lists based on the label claims or available GAP data. Where no ACVM registered product was found, the task Transfer Coefficient (TC) for “Default in absence of any data” was used, unless there was evidence that the product had uses on turf when the TC for “Transplanting, Hand weeding” was used. The maximum application rate stipulated in the HSNO approval decision document and the default or turf TC values were used to estimate REIs for “off label” uses, such as minor crops.

Not all label claims were modelled where re-entry worker dermal exposure was considered unlikely, for example with crop pre-emergence herbicide applications or weed clearance under established crop trees and vines. In some scenarios, for example herbicide applications to desiccate crops pre-harvest or selective herbicide applications to resistant crops, no TC value matched expected worker activities and another TC/activity value was substituted.

The REI modelling followed the EPA approach, from EPA (2020) “*Risk Assessment Methodology for Hazardous Substances.*” Appendix B, Section B.6:

B.6. Re-entry workers

B.6.1. Exposure linkage assessed

This section discusses the approach used, including the models, to assess the risks to people working in fields treated with pesticides shortly after treatment has taken place. The exposure of these re-entry workers is based on dermal exposure through contact with foliar residues only. Any exposure to other contaminated surfaces (for example, soil) or via inhalation pathways is not considered.

B.6.2. Model used

The European Predictive Operator Exposure Model database (EUROPOEM) approach developed by other international regulators (EUROPOEM, 2002; Chemicals Regulation Directorate, 2016b) is used, including the following equation:

$$REWE = \frac{(DFR)(TC)(WR)(AR)(DA)}{BW}$$

Equation B-3

where:

REWE = re-entry worker exposure ($\mu\text{g}/\text{kgbw}/\text{d}$)

DFR = dislodgeable foliar residue ($\mu\text{g}/\text{cm}^2$ per kgai/ha)

TC = transfer coefficient for the anticipated activity being performed (cm^2/h)

WR = work rate per day (h/d)

AR = application rate (kg/ha)

DA = dermal absorption (expressed as a proportion)

BW = body weight (kg).

This is considered a suitable model for re-entry worker assessment because it:

- is an internationally developed model based on a robust dataset
- assesses internal dose in comparison to the AOEL
- allows for dermal absorption estimates
- enables parameters such as dislodgeable foliar residue (DFR) to be taken into account, which means that the impact of multiple applications and length of the application intervals can be taken into account based on the application pattern in New Zealand
- gives an estimate of exposure when re-entry to the crop with no PPE or with basic PPE (gloves only) occurs and compares this with the AOEL
- estimates when unrestricted re-entry to the treated crops should be permitted for some crop types.

Multiple applications are taken into account by using guidance from the Forum for the Coordination of Pesticide Fate Models and their Use (FOCUS, 1997). The dislodgeable foliar residue in the above equation is the only parameter that is altered by multiple applications. Immediately after the nth treatment, the dislodgeable foliar residue ($DFR_n(a)$) is estimated assuming first-order dissipation and the following equation from FOCUS, 1997:

$$DFR_{n(a)} [= DFR_{multiple}] = (DFR_{single})(1 - e^{-nki})/(1 - e^{-ki})$$

Equation B-4

where:

n = number of applications

k = rate constant for foliar dissipation

i = interval between applications (days).

When more than one application is used, a multiple application factor (MAF) is sometimes used. The MAF is derived by rearranging Equation B-4, which becomes:

$$MAF = (1 - e^{-nki})/(1 - e^{-ki})$$

Equation B-5

and:

$$REWE = (DFR)(MAF)(TC)(WR)(DA)(AR/BW)$$

Equation B-6

The dislodgeable foliar residue will decrease over time following a treatment application, with the residual residue given by the equation:

$$DFR_{n(a)+t} = DFR_{n(a)}e^{-kt}$$

Equation B-7

where t = time since last application (days).

B.6.3. Assumptions and uncertainties

The model assumes that substances are absorbed through skin as a worker pushes past foliage that was sprayed. It does not consider inhalation or contact with impacted soils. It is important to check that the activities of re-entry workers match this assumption before using this model. If inhalation is an important pathway, then it must be considered separately.

The model assumes that the substance follows a first-order dissipation rate, with a default foliar life of 10 days (from FOCUS, 2003). Product and active ingredient specific data should be provided if available.

The more conservative dislodgeable foliar residue (DFR) factor for spray or concentrate use patterns may not always be relevant when the substance has dried; however, it is considered to be sufficiently conservative to be used in the risk assessment.

B.6.4. New Zealand specific parameters

The risks to a working adult are considered in Table B-2. No other parameters have been amended to be specific to New Zealand.

B.6.5. Default values

In the absence of specific dislodgeable foliar residue and foliar dissipation data, the default values in Table B-5 are used.

Table B-5 Re-entry worker default values

Parameter	Symbol	Value	Source
Dislodgeable foliar residue	DFR	3 µg/cm ² per kg _{ai} /ha	HSE (no date-a)
Foliar dissipation	k	0.0693	Corresponding to a foliar half-life of 10 days (FOCUS, 2003)

Transfer coefficients refer to the amount of contact between a re-entry worker and foliage. These are regarded as independent of the active ingredient/product used and depend on the crop type and the activity that the re-entry worker is carrying out (EUROPOEM, 2002). In the absence of data, values obtained from overseas regulators are used (see Table B-6). If there is a substance for which the crop or activity is unknown, a default reasonable worst case of 5,200 cm²/hr is used, unless judgement indicates that an alternative value may be more appropriate.

Table B-8 Default transfer coefficients

Crop	Activity	Transfer coefficient (cm ² /hr)	Source of transfer coefficient
Vegetables	Reach/Pick	2,500	EUROPOEM (2002)
Fruit from trees	Search/Reach/Pick	4,500	EUROPOEM (2002)
Berries	Reach/Pick	3,000	EUROPOEM (2002)
Ornamentals	Cut/Sort/Bundle/Carry	5,000	EUROPOEM (2002)
Turf	Mowing	1,000	NOHSC re-entry exposure model
Turf	Transplanting, Hand weeding	20,000	NOHSC re-entry exposure model
Pasture	Mowing	500	EFSA (2005)
Cereals	Scouting, Irrigation, Weeding mature/full foliage plants	1,000	US EPA (2007)
Default in absence of any data		5,200	-

NOHSC: [Australian] National Occupational Health and Safety Commission

These transfer coefficients all assume that re-entry workers are wearing long trousers and long sleeved shirts and are not wearing gloves. The impact of wearing gloves on worker exposure can be considered using the transfer coefficient values outlined in the EFSA operator, worker, resident and bystander model (EFSA, 2014a). The impact of wearing gloves cannot be calculated for some crops/activities because transfer coefficients attributable to hands only are not available. The available crops where the use of gloves and the resulting transfer coefficients are considered are shown in Table B-7.

Table B-7 Impact of gloves on transfer coefficients

Crop	Transfer coefficients for workers not wearing gloves (cm ² /hr)	Transfer coefficients for re-entry workers wearing gloves (cm ² /hr)
Vegetables	2,500	580
Ornamentals	5,000	1,400
Berries	3,000	750
Fruit trees	4,500	2,250

From EFSA (2014a)

B.6.6. Model outputs

The EUROPOEM equations calculate an absorbed dose by merging Equation B-3 and Equation B-4:

$$\text{Absorbed dose} = DFR_{n(a)}CD$$

Equation B-8

where:

$$C = (TC)(WR)(AR/BW)$$

D = dermal absorption.

This equation is sometimes re-arranged as Absorbed dose = (TC)(MAF)(WR)(D)(AR/BW).

B.6.7. Risk

Risks to re-entry workers immediately after the final treatment are estimated by calculating an RQ that compares the modelled exposure to the AOEL:

$$RQ = DFR_{n(a)}CD / AOEL$$

Equation B-9

The length of time required for the exposure to reduce to an acceptable level is also calculated; that is, so that:

$$DFR_{n(a)+t}CD = AOEL$$

Equation B-10

By rearranging this equation and incorporating Equation B-7, the restricted-entry interval (REI, also known as re-entry interval) is given by:

$$REI = \frac{\ln(RQ)}{k} = \frac{\ln(DFR_{n(a)}CD/AOEL)}{k}$$

Equation B-11

If an applicant identifies that a risk quotient will be greater than one, then substance- or ingredient-specific information on the following parameters can be used to refine the risk assessment:

- dermal absorption
- DFR data
- DT50 for foliar data.

Particular care is required to ensure that the correct units or unit conversions are used when calculating DFR, RQ and REI values for this exposure pathway. This is because DFR values are often presented in μg , whereas AOELs (used to calculate RQs and REIs) are often presented in mg – they need to be in the same units.

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