

FINAL REGISTRATION REPORT

Part B

Section 6

Mammalian Toxicology

Detailed summary of the risk assessment

Product code: MIEDZIAN EXTRA 350 SC

Product name: **MIEDZIAN EXTRA 350 SC**

Chemical active substance:

copper oxychloride, 614 g/L (copper, 350 g/L)

Central Zone

Zonal Rapporteur Member State: **Poland**

CORE ASSESSMENT

(re-authorization according art.43 art.51, Reg. 1107/2009)

Applicant: **Synthos Agro Sp. z o.o.**

Submission date: **07/2020; 08/2022**

MS Finalisation date: **2021; 08/2022**

Version history

When	What
07/2020	Renewal of registration of plant protection product according art. 43, Reg. 1107/2009
03/2021	Assessment by expert
08/2022	Calculation for professional and non-professional users acc. OPEX model
08/2022	Assessment by expert

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6 Mammalian Toxicology (KCP 7)

6.1 Summary

Table 6.1-1: Information on MIEDZIAN EXTRA 350 SC *

Product name and code	MIEDZIAN EXTRA 350 SC
Formulation type	Suspension Concentrate [SC]
Active substance(s) (incl. content)	copper; 350 g/L (copper oxychloride;
Function	Fungicide
Product already evaluated as the 'representative formulation' during the approval of the active substance(s)	No
Product previously evaluated in another MS according to Uniform Principles	No

* Information on the detailed composition of MIEDZIAN EXTRA 350 SC can be found in the confidential dRR Part C.

Justified proposals for classification and labelling

According to the criteria given in Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008, the following classification and labelling with regard to toxicological data is proposed for the preparation:

Table 6.1-2: Justified proposals for classification and labelling for MIEDZIAN EXTRA 350 SC according to Regulation (EC) No 1272/2008

Hazard classes, categories	Acute Tox. 4 Acute Tox. 4 Eye Irrit.2 Skin Sens. 1
Hazard pictograms or Codes for hazard pictograms	GHS07
Signal word	Warning
Hazard statements	H302- Harmful if swallowed. H332- Harmful if inhaled. H317- May cause an allergic skin reaction. H319-Causes serious eye irritation
Precautionary statements	P261 - Avoid breathing vapours/ spray P264- Wash hands thoroughly after handling. P280-Wear protective gloves/protective clothing/eye protection/face protection. P301+P312- IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. P302 + P352 - IF ON SKIN: Wash with plenty of water with soap. P304+P340- IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
Additional labelling phrases	To avoid risks to man and the environment, comply with the instructions for use. [EUH401]

Table 6.1-3: Summary of risk assessment for operators, workers, residents and bystanders for MIEDZIAN EXTRA 350 SC

	Result	PPE / Risk mitigation measures
Operators	Acceptable	Professional user: AOEM: In the case of tractor mounted sprayer – None. Work wear (arms, body and legs covered) and Gloves - M/L and A and Head and respiratory PPE (FP1, P1and similar): M/L and A in the case knapsack sprayer. Non-professional user: UK POEM: None
Workers	Acceptable	EUROPOEM II: Work wear (arms, body and legs covered) and Gloves.
Residents	Acceptable	None
Bystanders	Acceptable	None

No unacceptable risk for amateur operators, residents and bystanders was identified when the product is used as intended. No specific PPE is necessary.

No unacceptable risk for professional operators and workers was identified when the product is used as intended and provided that the PPE/ risk mitigation measures stated in Table 6.1-3 are applied.

A summary of the critical uses and the overall conclusion regarding exposure for operators, workers and residents/bystanders is presented in the following table.

- (tomato, , cucumber,); legume vegetables,

Table 6.1-4 Critical uses and overall conclusion of exposure assessment

1	2	3	4	5	6	7	8	9	10			
Use- No.*	Crops and situation (e.g. growth stage of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Application		Application rate		PHI (d)	Remarks: (e.g. safen- er/synergist (L/ha)) critical gap for operator, work- er, resident or bystander epo- sure based on [Guidance on the assessment of exposure of operators, work- ers, residents and bystanders in risk assess- ment for plant protection prod- ucts; EFSA Journal 2014;12(10):3874	Acceptability of exposure as- sessment			
			Method / Kind (incl. ap- plication technique ***	Max. number (min. interval between appli- cations) a) per use b) per crop/ season	Max. applica- tion rate kg as/ha a) a.s. 1 b) a.s. 2	Water L/ha min / max			Operator	Worker	Residents	Bystander
1	Apple, pear BBCH 00-07	Fpn	Spraying, HCTM	1; 2	0,525kg Cu/ha	500-750	n.a.					
2	Pear BBCH 00-07 BBCH 60-71	Fpn	Spraying, HCTM	1; 2	0,525kg Cu/ha	500-750	7					
3	Quince BBCH 00-07 BBCH 60-71	Fpn	Spraying, HCTM	1; 2	0,525kg Cu/ha	500-750	7					
4	Medlar BBCH 00-07 BBCH 60-71	Fpn	Spraying, HCTM	1; 2	0,525kg Cu/ha	500-750	7					
5	Cherry, sweet cherry BBCH 51 BBCH 60	Fpn	Spraying, HCTM	1 2	1,05 kg Cu/ha 0,525 kg Cu/ha	500-750	14					
6	Apricot BBCH 51 BBCH 60	Fpn	1 2	1,05 kg Cu/ha 0,525 kg Cu/ha	500-750	500-750	14					
7	Plum BBCH 51 BBCH 60	Fpn	1 2	1,05 kg Cu/ha 0,525 kg Cu/ha	500-750	500-750	14.					
8	Peach BBCH 00-03	Fpn	Spraying, HCTM	1	1,05 kg Cu/ha	700	n.a.					
9	Walnut Before flower- ing	Fpn	Spraying, HCTM	2	1,05 kg Cu/ha	800- 1000	n.a					

1	2	3	4	5	6	7	8	9	10			
10	Hazelnut Before flower- ing	Fpn	Spraying, HCTM	2	1,05 kg Cu/ha	800- 1000	n.a.					
11	Tomato (outdoor) BBCH 51-85	Fpn	Spraying	3	0.875 kg Cu/ha	700	7					
12	Tomato (in- door) BBCH 56-88	I	Spraying	3	1,25 kg Cu/ha	200- 1000	3					
13	Aubergines (baklażan) (outdoor) BBCH 51-85	Fpn	Spraying	3	0.875 kg Cu/ha	700	7					
14	Aubergines (indoor) BBCH 56-88	I	Spraying	3	1,25 kg Cu/ha	200- 1000	3					
15	Cucumber (outdoor) BBCH 62-78	Fpn	Spraying	3	0.875 kg Cu/ha	700	3					
16	Cucumber (indoor) BBCH 10-89	I	Spraying	4	0.8 kg Cu/ha	200- 1500	3					
17	Gherkins (korniszony) BBCH 62-78	Fpn	Spraying	3	0.875 kg Cu/ha	700	7					
18	Courgette (cukinia) BBCH 62-78	Fpn	Spraying	3	0.875 kg Cu/ha	700	7					
18	Melon (in- door) BBCH 10-89	I	Spraying	3	1.25 kg Cu/ha	200- 1500	7					
20	Pumpkins (indoor) BBCH 10-89	I	Spraying	3	1.25 kg Cu/ha	200- 1500	7					
21	Watermelon (indoor) BBCH 10-89	I	Spraying	3	1.25 kg Cu/ha	200- 1500	7					
22	French bean, bean with pods BBCH 65-69	Fpn	Spraying	3	0.875 kg Cu/ha	700	7					
23	Peas with pods BBCH 65-69	Fpn	Spraying,	3	0.75 kg Cu/ha	700	7					
24	Grape (table, wine) BBCH 13-17 BBCH 17-73 BBCH 73-77	Fpn	Spraying	3	1.05 kg Cu/ha	500-900	21					
25	Currant BBCH 59-65 BBCH 59 -81	Fpn	Spraying	2	1.05 kg Cu/ha	700	7					

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor

application
*** e.g. LC: low crops, HC: high crop, TM: tractor-mounted, HH: hand-held

Explanation for column 10 “Acceptability of exposure assessment”

A	Exposure acceptable without PPE / risk mitigation measures
R	Further refinement and/or risk mitigation measures required
N	Exposure not acceptable/ Evaluation not possible

Data gaps

N/A.

Noticed data gaps are:

- Toxicological information on the stabilisers used in the technical concentrates by some manufacturers of copper hydroxide, copper oxychloride, tribasic copper sulfate and copper I oxide, relevant for all representative uses evaluated.

(EFSA Journal 2018;16(1):5152)

6.2 Toxicological Information on Active Substance(s)

Information regarding classification of the active substances and on EU endpoints and critical areas of concern identified during the EU review are given in Table 6.2-1.

Table 6.2-1: Information on active substance(s)

	Copper as Copper oxychloride
Common Name	Coppes oxychloride; Dicopper chloride trihydroxide
CAS-No.	1332-65-6 or 1332-40-7
Classification and proposed labelling	
With regard to toxicological endpoints (according to the criteria in Reg. 1272/2008, as amended)	<p>Hazard classess, categories: Acute Tox.3 Acute Tox. 4 Codes for hazard pictograms: GHS06 Signal word: Danger Hazard statements: H301 - Toxic if swallowed H332 – Harmful if inhaled. Precautionary statements: P261 – Avoid breathing dust/fume/gas/mist/vapours/ spray. P264 – Wash skin and eyes thoroughly after handling. P270- Do not eat, drink or smoke when using this product. P271- Use only outdoors or in a well-ventilated area P301+P310-IF SWALLOWED: Immediately call a POISON CENTER/doctor. P321 - Specific treatment (see ... on this label). P330 - Rinse mouth. P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. P312 - Call a POISON CENTER/doctor if you feel unwell.</p>
Additional C&L proposal	-
Agreed EU endpoints	
AOEL systemic	0.08 mg/kg bw/d (corrected for 50% oral absorption/ bioavailability)

	Copper as Copper oxychloride
Reference	Peer review of the pesticide risk assessment of the active substance copper compounds, <i>EFSA Journal</i> 2018;16(1):5152
Conditions to take into account/critical areas of concern with regard to toxicology	
According to Peer review for active substance- copper compounds	None.

6.3 Toxicological Evaluation of Plant Protection Product

A summary of the toxicological evaluation for MIEDZIAN EXTRA 350 SC is given in the following tables. Full summaries of studies on the product that have not been previously considered within an EU peer review process and have been previously considered within a national level are described in detail in Appendix 2.

Table 6.3-1: Summary of evaluation of the studies on acute toxicity including irritancy and skin sensitisation for MIEDZIAN EXTRA 350 SC

Type of test, species, model system (Guideline)	Result	Acceptability	Classification (acc. to the criteria in Reg. 1272/2008)	Reference
LD ₅₀ oral, rat (OECD 420)	300<LD ₅₀ < 2000 mg/kg bw	Yes	Acute Tox. 4 (H302)	xxx, 2006
LD ₅₀ dermal, rat (OECD 402)	> 2000 mg/kg bw	Yes	None	xxx, 2006
LC ₅₀ inhalation, rat (OECD 403)	> 2.13 mg/L air	Yes	Acute Tox. 4 (H332)	xxx, 2007
Skin irritation, rabbit (OECD 404)	Non-irritant	Yes	None	xxx, 2006
Eye irritation, rabbit (OECD 405)	Irritant	Yes	Eye Irrit. 2 (H319)	xxx, 2006
Skin sensitisation, guinea pig (OECD 406)	Sensitising	Yes	Skin Sens. 1 (H317)	xxx, 2006
Supplementary studies for combinations of plant protection products	No data – not required			

Formulation does not contain any substances classified as:

- acute dermal toxicity,
- skin irritant,
- respiratory sensitizer,
- germ cell mutagenic,
- cancerogenic,
- toxic on reproduction,
- toxic on specific target organs (single exposure),
- aspiration hazard.

Thus according to points 3.5, 3.6, 3.7, 3.8, 3.10 of Regulation (EC) 1272/2008 product MIEDZIAN EXTRA 350 SC does not need to be classified in above mentioned categories.

MIEDZIAN EXTRA 350 SC contains one co-formulant, which is classified as STOT RE 2 with hazard statement H373. Its concentration in the product is equal to 4.2%. This concentration is below concentra-

tion limit (10%) stated in Table 3.9.4 of Regulation (EC) 1272/2008, therefore the product is not classified as STOT RE 2 with hazard statement H373.

6.4 Toxicological Evaluation of Groundwater Metabolites

All metabolite concentrations are predicted to stay below 0.1 µg/L – no groundwater assessment is required.

6.5 Dermal Absorption (KCP 7.3)

A summary of the dermal absorption rates for the active substances in MIEDZIAN EXTRA 350 SC are presented in the following table.

Table 6.5-1: Dermal absorption rates for active substances in MIEDZIAN EXTRA 350 SC

	Copper as Copper oxychloride	
	Value	Reference
Concentrate	1 %	1. Peer review of the pesticide risk assessment of the active substance copper compounds, <i>EFSA Journal</i> 2018;16(1):5152.
Dilution	9 %	2. RAR, Copper compounds, Vol.3, B.6 (PPP).

6.5.2 Justification for proposed values - copper

No data on dermal absorption for copper in MIEDZIAN EXTRA 350 SC is available. Justifications for values according to studies presented in the RAR for copper compounds are presented below.

Two new dermal absorption studies on different form of copper have been submitted by the EU Copper Task Force since the first approval of the substance. The first one (xxx 2012) analysed the *in vitro* dermal absorption of copper from 8 formulations through human skin using non-radioactive analytical methods. The second one (xxx, 2015) analysed the *in vitro* absorption of copper from 2 different formulations (a liquid and a solid formulation) through human skin using radiolabelled copper (copper isotope 65).

The first study (Maas 2012) tested the *in vitro* percutaneous absorption of copper through human skin membranes from eight different agrochemical formulations. After adjustment regarding variability between replicates and formulation, and low recovery, RMS (France) proposed dermal absorption values of **0.3% for the concentrate and 8.4% for the field dilution** applicable all copper formulations. This study presenting some limitations regarding the validation of the analytical methods, this result can be used only as supportive information for the second study.

The second study (Maas 2015) assessed the percutaneous absorption of copper, formulated as Copper hydroxide 50 WP or Copper oxychloride, *in vitro* through human skin using a radio-labelled method. No limitations were detected for this study. Taking into account the variability between replicates, dermal absorption values for both copper formulations ranged from **0.1% to 0.6% for the concentrate and 3.5% to 8.9% for the field dilution** (1.5g Cu/L).

It can be concluded that both studies gave the same range of dermal absorption values. No influence of the chemical form of Cu or the type of formulation was highlighted. Based on the xxx study from 2015 supported by the first xxx study from 2012, RMS (France) proposed copper dermal absorption values of **1% and 9% (rounded values), for the concentrate and the field**

dilution (0.33g Cu/L), respectively. These dermal absorption values cover all the formulations tested and thus can be applicable for all chemical form of copper and all type of copper formulations.

The variants supported as copper fungicides are barely soluble inorganic salts, formulated as WP, WG or SC. Particles are not absorbed through skin. It has been demonstrated that dermal absorption of copper is furthermore affected by the individual differences in metal oxidation, which has a great impact on the ability of copper to permeate the skin.

It is obvious that copper ion absorption through the skin does not follow the diffusion law applied for hydrophobic compounds. Copper ions from the inorganic fungicidal salts will have to enter the natural pathways for absorption and be controlled by the same processes. This is the reason why studies Maas, W.J.M. (2012) and Maas, W.J.M. and Kunne, C. (2015) do not show significant differences between the *in vitro* absorption of the five copper variants, the three different formulation types, and the different spray dilution concentrations. In none of the products tested did copper reach the receptor fluid in significant amount, and the only difference might be the speed and depth of penetration into the skin layers.

It can be concluded that the copper transport through the skin will be independent of the nature of the inorganic salt, its formulation type (as long as the co-formulants do not include chelating agents similar to the naturally present copper complexing agents), and the spray dilution. In all cases the *in vitro* studies show a very low absorption, if any, within the limit of quantification of the analytical method used.

Table 6.5-2: Default dermal absorption rates for Copper

	Value	Justification for value	Acceptability of justification
Concentrate	1 %	Based on study presented in the RAR (Maas, W.J.M. (2012) and Maas, W.J.M. and Kunne, C. (2015)), it is proposed copper dermal absorption values of 1% and 9%, for the concentrate and the field dilution (0.33g Cu/L), respectively. These dermal absorption values cover all the formulations tested and thus can be applicable for all chemical form of copper and all type of copper formulations.	Acceptable
Dilution	9 %		Acceptable

Proposed dermal absorption rates for copper are based on dermal absorption studies on a 8 copper formulations. An *in vitro* absorption study using human and rat skin was conducted to determine the rates of penetration and distribution of metallic copper from eight copper formulations. The study results are summarised in the following table. Full summaries of studies on the dermal absorption of copper and 8 copper formulations that have been evaluated within an EU peer review process (RAR, Copper compounds, Vol.3, B.6 (PPP)).

The results of the experiments with copper and 8 of copper formulations are applicable for the risk assessment of the present application.

Based on above, Applicant has proposed for MIEDZIAN EXTRA 350 SC a default dermal absorption value of 1% for the concentrate and 9% for the spray solution.

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The results of the experiments with copper and 8 of copper formulations are applicable for the risk assessment of the present application.

Based on above, Applicant has proposed for MIEDZIAN EXTRA 350 SC a default dermal absorption value of 1% for the concentrate and 9% for the spray solution.

Table 6.5-3: Summary of the results of submitted dermal absorption studies for copper

Test	Concentrate	Spray dilution (dilution factor)	Formulation in study	Acceptability of study	Justification provided on representativity of study formulation for current product	Acceptability of justification	Reference*
<i>In vitro</i> (human)	0.09%	5.68%	Copper hydroxide 250 g Cu/L, SC	Yes	Not required	Justification accepted. Endpoint can be used for current product / Justification not accepted. Endpoint cannot be used for current product.	xxx., 2012
	0.17%	5.95%	Copper hydroxide 50 WP				
	0.33%	3.39%	H1B10 Copper hydroxide 25% WG				
	0.13%	10.44%	Flowbrix (copper oxychloride 380 g Cu/L SC)				
	0.2%	2.66%	Copper Oxychloride 37.5 NC WG				
	0.29%	4.60%	Bordeaux mixture 20% Cu WP				
	0.12%	8.66%	BBC/Bouillie Bordelaise (Bordeaux mixture 20% Cu WG)				
	0.21%	4.74%	Nordox 75 WG (copper oxide 75% WG)				
<i>In vitro</i> (human and rat)	0.6%	8.9%	Copper hydroxide 50 WP;	Yes	Not required	Justification accepted. Endpoint can be used for current product / Justification	xxx. 2015

Test	Concen- trate	Spray dilution (dilution factor)	Formulation in study	Acceptability of study	Justification provided on representativity of study formu- lation for cur- rent product	Acceptability of justifica- tion	Reference*
	0.1%	3.5%	Flowbrix SC			not accepted. Endpoint cannot be used for current product.	

* indicates that a study was reviewed at EU level

6.6 Exposure Assessment of Plant Protection Product (KCP 7.2)

Table 6.6-1: Product information and toxicological reference values used for exposure assessment

Product name and code	MIEDZIAN EXTRA 350 SC
Formulation type	SC
Category	Fungicide, bacteriocide
Active substance(s) (incl. content)	Copper oxychloride (copper) 614 g/L (350 g/l)
AOEL systemic	0.08 mg/kg bw/d
Inhalation absorption	100%
Oral absorption	50%
Dermal absorption	Concentrate: 10 % (default) Dilution: 50 % (default)

6.6.1 Selection of critical use(s) and justification

The critical GAP used for the exposure assessment of the plant protection product is shown in Table 6.1-4. A list of all intended uses within the zone is given in Part B, Section 0.

6.6.2 Operator exposure (KCP 7.2.1)

6.6.2.1 Estimation of operator exposure

A summary of the exposure models used for estimation of operator exposure to the active substances during application of MIEDZIAN EXTRA 350 SC according to the critical uses is presented in Table 6.6-2. The outcome of the estimation is presented in Table 6.6-3. Detailed calculations are in Appendix 3.

Table 6.6-2: Exposure models for intended uses

Critical uses	Pome frutis: Apple, Pear, Quince, Medlar (max. 1.5 kg PPP/ha)
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	<p>Stone fruits: Cherry, sweet cherry (max. 3 kg PPP/ha) Apricot, Plum (max. 3 kg PPP/ha) Peach (max. 3 kg PPP/ha)</p> <p>Tree nuts Walnut, Hazelnut (max. 3 kg PPP/ha)</p> <p>Fruiting vegetables (outdoor): Tomato (max. 2.5 kg PPP/ha) Aubergines (max. 2.5 kg PPP/ha) Cucumber (max. 2.5 kg PPP/ha) Gherkins (max. 2.5 kg PPP/ha) Courgette (max. 2.5 kg PPP/ha)</p> <p>Fruiting vegetables (indoor): Tomato (max. 3.6 kg PPP/ha) Aubergines (max. 3.6 kg PPP/ha) Cucumber (max. 2.3 kg PPP/ha) Melon (max. 3.6 kg PPP/ha) Pumpkins (max. 3.6 kg PPP/ha) Watermelon (max. 3.6 kg PPP/ha)</p> <p>Legume vegetables French bean (max. 2.5 kg PPP/ha) Peas with pods (max. 2.5 kg PPP/ha)</p> <p>Table and wine grapes: Grape (max. 3 kg PPP/ha)</p> <p>Berries and small fruits: Currant (max. 3 kg PPP/ha)</p>
Models	<p>Guidance on the assessment of exposure of operators, workers, residents and bystanders in risk assessment for plant protection products; EFSA Journal 2014;12(10):3874 calculator version: 30/03/2015</p> <p>Dutch Greenhous Model (Van Golstein Brouwers, Y.G.C., Marquart, J. and Van Hemmen, J.J. (1996). Assessment of occupational exposure to pesticides in agriculture. Part IV. Protocol for the use of generic exposure data. TNO Nutrition and Food Research Institute, The Netherlands. TNO Report V 96.120)</p> <p>UK Predictive Operator Exposure Model (UK POEM)</p> <p>OPEX model v. 0.3.22</p> <p>Non-professional use in home gardeens - exposure assessment (version 1.3 (22.03.2022))</p>

Table 6.6-3: Estimated operator exposure (longer term exposure)

A. Professional users

		Copper oxychloride	
Model data	Level of PPE	Total absorbed dose (mg/kg/day)	% of systemic AOEL
Pome frutis Apple, pear, Quince, Medlar			
Tractor mounted boom spray application outdoors to high crops			
Application rate		0.525 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg Late season	No PPE	0.0372	46.6 %
	Gloves: M/L and A	0.0260	32.5 %
OPEX model v 0.3.22	No PPE	0.1048	131 %
	Work wear (arms, body and legs covered): M/L and A	0.0333	41.6 %
Manual Knaosack application to high crops			
Application rate		0.525 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	1.66	2074.5 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.072	89.6 %
OPEX model v 0.3.22	No PPE	0.0888	111 %
	Work wear (arms, body and legs covered): M/L and A	0.0070	8.8 %
Stone frutis Cherry, sweet cherry, apricot, plum, peach			
Tractor mounted boom spray application outdoors to high crops			
Application rate		1.05 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg 1 application	No PPE	0.0713	89.2 %
	Gloves: M/L and A	0.0510	63.8 %
OPEX model v 0.3.22	No PPE	0.2032	254 %

	Work wear (arms, body and legs covered): M/L and A	0.061	76.2 %
Manual Knapsack application to high crops			
Application rate		1.05 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg Late season 1 application	No PPE	1.861	2326.9 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.073	91.9 %
	Gloves; Work wear (arms, body and legs covered): M/L and A + head and respiratory PPE (FP1, P1 and similar): A	0.0710	88.8 %
OPEX model v 0.3.22	No PPE	0.1016	127 %
	Work wear (arms, body and legs covered): M/L and A	0.0095	11.9 %
Stone frutis Cherry, sweet cherry, apricot, plum			
Tractor mounted boom spray application outdoors to high crops			
Application rate		0.525 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg 2 applications	No PPE	0.0372	46.6 %
	Gloves: M/L and A	0.0260	32.5 %
OPEX model v 0.3.22	No PPE	0.1048	131%
	Work wear (arms, body and legs covered): M/L and A	0.0333	41.6 %
Manual Knapsack application to high crops			
Application rate		0.525 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg 2 applications	No PPE	1.66	2074.5 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.072	89.6 %
OPEX model v 0.3.22	No PPE	0.97768	111 %
	Work wear (arms, body and legs covered): M/L	0.0070	8.8 %

	and A		
Tree nuts Walnut, Hazelnut			
Tractor mounted boom spray application outdoors to high crops			
Application rate		1.05 kg a.s./ha	
Spray application (AOEM; 75 th percen- tile) Body weight: 60 kg 2 applications	No PPE	0.0713	89.2 %
	Gloves: M/L and A	0.0510	63.8 %
OPEX model v 0.3.22	No PPE	0.2032	254 %
	Work wear (arms, body and legs covered): M/L and A	0.0696	76.2 %
Manual Knapsack application to high crops			
Spray application (AOEM; 75 th percen- tile) Body weight: 60 kg	No PPE	1.861	2326.9 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.073	91.9 %
	Gloves; Work wear (arms, body and legs covered): M/L and A + head and respiratory PPE (FP1, P1 and similar): A	0.0710	88.8 %
OPEX model v 0.3.22	No PPE	0.1016	127 %
	Work wear (arms, body and legs covered): M/L and A	0.0095	11.9 %
Fruiting vegetables (outdoor) Tomato, Aubergines, Cucumber, Gherkins, Courgette			
Tractor mounted boom spray application outdoors to low crops			
Application rate		0.875 kg a.s./ha	
Spray application (AOEM; 75 th percen- tile) Body weight: 60 kg 3 applications	No PPE	0.0394	49.3 %
	Gloves: M/L and A	0.0154	19.3 %
OPEX model v 0.3.22	No PPE	0.0414	51.7 %

	Work wear (arms, body and legs covered): M/L and A	0.0262	32.8 %
Manual- Knapsack application to low crops			
Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	0.138	172.8%
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.0142	17.8 %
OPEX model v 0.3.22	No PPE	0.1384	173 %
	Work wear (arms, body and legs covered): M/L and A	0.01833	22.9 %
Fruiting vegetables (indoor) Tomato, Aubergines, Melon, Pumpkins, Watermelon			
Hand held sparyer			
Application rate		1.25 kg a.s./ha	
Dutch Greenhouse Model Treated area: 1 ha Body weight: 70 kg	No PPE	0.3393	424.2 %
	Work wear (arms, body and legs covered) M/L and A + non-powered mask filtr type 2	0.03393	42.4 %
OPEX model v 0.3.22 Manual- Knapsack	No PPE	0.0611	76.4 %
	Work wear (arms, body and legs covered): M/L and A	0.0085	10.6 %
Fruiting vegetables (indoor) Cucumber			
Hand held sparyer/ Manual- Knapsack			
Application rate		0.8 kg a.s./ha	
Dutch Greenhouse Model Treated area: 1 ha Body weight: 70 kg	No PPE	0.2171	271.4 %
	Work wear (arms, body and legs covered) M/L and A + non-powered mask filtr type 2	0.0217	27.1 %
OPEX model v 0.3.22 Manual- Knapsack	No PPE	0.0398	49.8 %
	Work wear (arms, body and legs covered): M/L and A	0.0062	7.7 %

Legume vegetables			
French bean, Peas with pods, Bean with pods			
Tractor mounted boom spray application outdoors to low crops			
Application rate		0.875 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	0.0394	49.3 %
	Gloves: M/L and A	0.0154	19.3 %
OPEX model v 0.3.22	No PPE	0.1704	213 %
	Work wear (arms, body and legs covered): M/L and A	0.0519	64.9 %
Manual- Knapsack application to low crops			
Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	0.138	172.8%
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.0142	17.8 %
OPEX model v 0.3.22	No PPE	0.0976	122 %
	Work wear (arms, body and legs covered): M/L and A	0.0087	10.9 %
Table and wine grapes			
Grape			
Tractor mounted boom spray application outdoors to high crops			
Application rate		1.05 kg a.s./ha	
Spray application (AOEM; 75 th percentile) Body weight: 60 kg Upward spraying	No PPE	0.200	249.7 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.0249	31.1 %
OPEX model v 0.3.22	No PPE	0.2032	254 %
	Work wear (arms, body and legs covered): M/L and A	0.0696	76.2 %
Manual- Knapsack application to high crops			
Spray application (AOEM; 75 th percentile) Body weight: 60 kg Upward spraying	No PPE	1.861	2326.9 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.073	91.9 %
	Gloves; Work wear	0.0710	88.8 %

	(arms, body and legs covered): M/L and A + head and respiratory PPE (FP1, P1 and similar): A		
OPEX model v 0.3.22	No PPE	0.1016	127 %
	Work wear (arms, body and legs covered): M/L and A	0.0095	11.9 %
Berries and small fruits Currant			
Tractor mounted boom spray application outdoors to low crops			
Application rate		1.05 kg a.s./ha	
%Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	0.046	57.5 %
	Gloves: M/L and A	0.0179	22.3%
OPEX model v 0.3.22	No PPE	0.2032	254 %
	Work wear (arms, body and legs covered): M/L and A	0.0696	76.2 %
Manual- Knapsack application to low crops			
Spray application (AOEM; 75 th percentile) Body weight: 60 kg	No PPE	0.1382	172.8 %
	Gloves; Work wear (arms, body and legs covered): M/L and A	0.0142	17.8 %
OPEX model v 0.3.22	No PPE	0.1016	127 %
	Work wear (arms, body and legs covered): M/L and A	0.0095	11.9 %

In the case of the application of MIEDZIAN EXTRA 350 SC using tractor mounted sprayer, according to the model calculations, it can be concluded that the risk for the operator using MIEDZIAN EXTRA 350 SC is acceptable:

- even when personal protective equipment gloves is not used in the case of pome and stone fruits (apple, pear, quince, medlar, cherry, sweet cherry, apricot, plum, peach), tree nuts (walnut, hazelnut), fruiting vegetables (tomato, aubergines, cucumber, gherkins, courgette); legume vegetables (french bean, peas with pods, bean with pods), currant.
-
- gloves and work wear (arms, body and legs covered) during mixing/loading and application, head and respiratory PPE (FP1, P1 and similar) during application is used, in the case of grape.
-
- gloves and work wear (arms, body and legs covered) during mixing/loading and application, head and non-powdered mask filtr type 2 during mixing/loading and application is used, in

the case of fruiting vegetables cultivated indoor: tomato, aubergines, melon, pumpkins, watermelon, cucumber.

In the case of application of MIEDZIAN EXTRA 350 SC using manual knapsack sprayer, operator exposure is acceptable when personal protective equipment:

- gloves, work wear (arms, body and legs covered), head and respiratory PPE (FP1, P1 and similar) during mixing/loading and application is used in the case of fruiting trees.
-
- gloves, work wear (arms, body and legs covered) during mixing/loading and application is used in the case of fruiting vegetables (indoor and outdoor), legume vegetables, grape, currant.

B. Non-professional user

		Copper oxychloride	
Model data	Level of PPE	Total absorbed dose (mg/kg/day)	% of systemic AOEL
Home garden sprayer (5 L tank; outdoor application to high crops)			
Pome frutis: Apple, Pear, Quince, Medlar Stone frutis: Cherry, sweet cherry, apricot, plum			
Application rate		0.525 kg a.s./ha	
UK POEM Application volume 500 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.0315	39.4 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 500 L/ha Treated area: 0.05 ha	No PPE	0.0888	111 %
	No PPE Reduction factor: 20 *	0.0045	5.6 %
Stone frutis: Cherry, sweet cherry, apricot, plum			
Application rate		1.05 kg a.s./ha	
UK POEM Application volume 500 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.05713	71.4 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 500 L/ha Treated area: 0.05 ha	No PPE	0.1016	127 %
	No PPE Reduction factor: 20*	0.0051	6.4 %
Stone frutis: peach			
Application rate		1.05 kg a.s./ha	

UK POEM Application volume 700 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.0483	60.4 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 700 L/ha Treated area: 0.05 ha	No PPE	0.1016	127 %
	No PPE Reduction factor: 20*	0.0051	6.4 %
Tree nuts: Walnut, Hazelnut			
Application rate		1.05 kg a.s./ha	
UK POEM Application volume 800 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.04373	54.7 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 800 L/ha Treated area: 0.05 ha	No PPE	0.1016	127 %
	No PPE Reduction factor: 20*	0.0051	6.4 %
Fruiting vegetables (outdoor) Tomato, Aubergines, Cucumber, Gherkins, Courgette			
Application rate		0.875 kg a.s./ha	
UK POEM Application volume 700 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.0422	52.8 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 700 L/ha Treated area: 0.05 ha	No PPE	0.1384	173 %
	No PPE Reduction factor: 20*	0.0070	8.7 %
Fruiting vegetables (indoor) Tomato, Aubergines, Melon, Pumpkins, Watermelon			
Application rate		1.25 kg a.s./ha	
UK POEM Application volume 500 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.01696	21.2 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 200 L/ha Treated area: 0.05 ha	No PPE	0.0611	76.4 %
	No PPE Reduction factor: 20*	0.0030	3.8 %
Fruiting vegetables (indoor) Cucumber			
Application rate		0.8 kg a.s./ha	

UK POEM Application volume 500 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.01086	13.6 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 200 L/ha Treated area: 0.05 ha	No PPE	0.0398	49.8 %
	No PPE Reduction factor: 20*	0.002	2.5 %
Legume vegetables French bean, Peas with pods, Bean with pods			
Application rate		0.875 kg a.s./ha	
UK POEM Application volume 700 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.0422	52.8 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 700 L/ha Treated area: 0.05 ha	No PPE	0.0976	122 %
	No PPE Reduction factor: 20*	0.0049	6.1 %
Table and wine grapes Grape			
Application rate		1.05 kg a.s./ha	
UK POEM Application volume 500 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.05713	71.4 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 500 L/ha Treated area: 0.05 ha	No PPE	0.1016	127 %
	No PPE Reduction factor: 20*	0.0051	6.4 %
Berries and small fruits Currant			
Application rate		1.05 kg a.s./ha	
UK POEM Application volume 700 L/ha Treated area: 0.01 ha Time: 0.5 h Body weight: 60 kg	No PPE	0.0483	60.4 %
OPEX model v 0.3.22 Manual-Knapsack Application volume 700 L/ha Treated area: 0.05 ha	No PPE	0.1016	127 %
	No PPE Reduction factor: 20*	0.0051	6.4 %

*- Reduction factor for smaller area: estimated garden area[ha]/ 1 ha (according to *Non-professional use in home gardens - exposure assessment* (version 1.3 (22.03.2022))). In Poland estimated garden area = 0.05 ha.

In the case of application of MIEDZIAN EXTRA 350 SC using home garden sprayer (5L), according to the models calculations, it can be concluded that the risk for the operator using MIEDZIAN EXTRA 350 SC is acceptable even personal protective equipment is not used.

Applied OPEX model v 0.3.22 is accepted

6.6.2.2 Measurement of operator exposure

Since the operator exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) will not be exceeded under conditions of intended uses and consideration of the above mentioned personal protective equipment (PPE), a study to provide measurements of operator exposure was not necessary and was therefore not performed.

6.6.3 Worker exposure (KCP 7.2.3)

6.6.3.1 Estimation of worker exposure

Table 6.6-4 shows the exposure model(s) used for estimation of worker exposure after entry into a previously treated area or handling a crop treated with MIEDZIAN EXTRA 350 SC according to the critical uses. Outcome of the estimation is presented in Table 6.6-5. Detailed calculations are in Appendix 3.

Table 6.6-4: Exposure models for intended uses

Critical uses	<p>Pome fruits: Apple, Pear, Quince, Medlar (max. 1.5 kg PPP/ha)</p> <p>Stone fruits: Cherry, sweet cherry (max. 3 kg PPP/ha) Apricot, Plum (max. 3 kg PPP/ha) Peach (max. 3 kg PPP/ha)</p> <p>Tree nuts Walnut, Hazelnut (max. 3 kg PPP/ha)</p> <p>Fruiting vegetables (outdoor): Tomato (max. 2.5 kg PPP/ha) Aubergines (max. 2.5 kg PPP/ha) Cucumber (max. 2.5 kg PPP/ha) Gherkins (max. 2.5 kg PPP/ha) Courgette (max. 2.5 kg PPP/ha)</p> <p>Fruiting vegetables (indoor): Tomato (max. 3.6 kg PPP/ha) Aubergines (max. 3.6 kg PPP/ha) Cucumber (max. 2.3 kg PPP/ha) Melon (max. 3.6 kg PPP/ha) Pumpkins (max. 3.6 kg PPP/ha) Watermelon (max. 3.6 kg PPP/ha)</p> <p>Legume vegetables French bean (max. 2.5 kg PPP/ha) Peas with pods (max. 2.5 kg PPP/ha)</p>
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	Table and wine grapes: Grape (max. 3 kg PPP/ha) Berries and small fruits: Currant (max. 3 kg PPP/ha)
Models	EUROPOEM II Hemmen et al (2002) Post-application exposure of workers to pesticides in agriculture. Report of the re-entry working group. EUROPOEM II project. FAIR3 CT96-1406

Table 6.6-5: Estimated worker exposure (longer term exposure)

		Copper as Copper oxychloride	
Model data	Level of PPE	Total absorbed dose (mg/kg bw/day)	% of systemic AOEL
Pome frutis: Apple, Pear, Quince, Medlar Stone fruits: Cherry, sweet cherry, apricot, plum			
Searching, Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 7 days MAF = 1.9 AR _{MAF} = 1.9 x 0.525 = 0.9975 kg	
Number of applications and application rate		2 x 0.525 kg a.s./ha	
Body weight: 60 kg TC: 4500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1039	129.9 %
	With gloves	0.0208	26 %
Stone fruits: Cherry, sweet cherry, apricot, plum, peach			
Searching, Reaching, picking Outdoor Work rate: 6 hours/day,		DT ₅₀ : 30 days DFR: 3 µg/cm ² /kg a.s./ha	
Number of applications and application rate		1 x 1.05 kg a.s./ha	
Body weight: 60 kg TC: 4500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.110	136.7 %
	With gloves	0.0219	27.3 %
Tree nuts: Walnut, Hazelnut			
Searching, Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 10 days MAF 1.8 AR _{MAF} = 1.8 x 1.05 = 1.89 kg/ha	
Number of applications and application rate		2 x 1.05 kg a.s./ha	
Body weight: 60 kg TC: 4500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1968	246 %
	With gloves	0.0394	49.2 %

Fruiting vegetables (outdoor): Tomato, Aubergines, Cucumber, Gherkins, Courgette			
Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 7 days MAF 2.6 AR _{MAF} = 2.6 x 0.875 = 2.275 kg/ha	
Number of applications and application rate		3 x 0.875 kg a.s./ha	
Body weight: 60 kg TC: 2500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1316	164.5 %
	With gloves	0.0263	32.9 %
Fruiting vegetables (indoor) Tomato, Aubergines, Melon, Pumpkins, Watermelon			
Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 7 days MAF 2.6 AR _{MAF} = 2.6 x 0.875 = 2.275 kg/ha	
Number of applications and application rate		3 x 0.875 kg a.s./ha	
Body weight: 60 kg TC: 2500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1423	177.9 %
	With gloves	0.0274	34.3 %
Fruiting vegetables (indoor): Cucumber			
Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 7 days MAF 3.2 AR _{MAF} = 3.2 x 0.8 = 2.56 kg/ha	
Number of applications and application rate		4 x 0.8 kg a.s./ha	
Body weight: 60 kg TC: 2500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1602	200.2 %
	With gloves	0.0308	38.5 %
Legume vegetables: French bean, Peas with pods, Bean with pods			
Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 7 days MAF = 2.6 AR _{MAF} = 2.6 x 0.875 = 2.275 kg/ha	
Number of applications and application rate		3 x 0.875 kg a.s./ha	
Body weight: 60 kg TC: 2500 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1316	164.5 %
	With gloves	0.0263	32.9 %
Table and wine grapes: Grape			

Harvesting Outdoor Work rate: 3 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 10 days MAF 2.4 AR _{MAF} = 2.4 x 1.05 = 2.52kg/ha	
Number of applications and application rate		3 x 1.05 kg a.s./ha	
Body weight: 60 kg TC: 10100 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.2945	368.1 %
	With gloves	0.0589	73.6 %
Berries and small fruits: Currant			
Reaching, picking Outdoor Work rate: 6 hours/day, DT ₅₀ : 30 days		DFR: 3 µg/cm ² /kg a.s./ha Interval between treatments: 10 days MAF 1.8 AR _{MAF} = 1.8 x 1.05 = 1.89 kg/ha	
Number of applications and application rate		2 x 1.05 kg a.s./ha	
Body weight: 60 kg TC: 3000 cm ² /person/h PPE: Work wear (arms, body and legs covered)	No gloves	0.1312	164 %
	With gloves	0.0262	32.8 %

In the case of the worker exposure, according to the model calculations, it can be concluded that the risk for the worker is acceptable when personal protective equipment (gloves) is used.

Based on the above calculation, the label should contain standard phrases: *Ventilate treated areas/greenhouses thoroughly/time to be specified/ until spray has dried before re-entry.*

6.6.3.2 Refinement of generic DFR value (KCP 7.2)

Not required.

6.6.3.3 Measurement of worker exposure

Since the worker exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) will not be exceeded under conditions of intended uses and considering above mention PPE, a study to provide measurements of worker exposure was not necessary and was therefore not performed.

6.6.4 Resident and bystander exposure (KCP 7.2.2)

6.6.4.1 Estimation of resident and bystander exposure

No bystander risk assessment is required for PPPs that do not have significant acute toxicity or the potential to exert toxic effects after a single exposure. Exposure in this case will be determined by average exposure over a longer duration, and higher exposures on one day will tend to be offset by lower exposures on other days. Therefore, exposure assessment for residents also covers bystander exposure.

Table 6.6-6 shows the exposure model used for estimation of resident and bystander exposure to copper. The outcome of the estimation is presented in

Critical uses	<p>Pome frutis: Apple, Pear, Quince, Medlar (max. 1.5 kg PPP/ha)</p> <p>Stone fruits: Cherry, sweet cherry (max. 3 kg PPP/ha) Apricot, Plum (max. 3 kg PPP/ha) Peach (max. 3 kg PPP/ha)</p> <p>Tree nuts Walnut, Hazelnut (max. 3 kg PPP/ha)</p> <p>Fruiting vegetables (outdoor): Tomato (max. 2.5 kg PPP/ha) Aubergines (max. 2.5 kg PPP/ha) Cucumber (max. 2.5 kg PPP/ha) Gherkins (max. 2.5 kg PPP/ha) Courgette (max. 2.5 kg PPP/ha)</p> <p>Fruiting vegetables (indoor): Tomato (max. 3.6 kg PPP/ha) Aubergines (max. 3.6 kg PPP/ha) Cucumber (max. 2.3 kg PPP/ha) Melon (max. 3.6 kg PPP/ha) Pumpkins (max. 3.6 kg PPP/ha) Watermelon (max. 3.6 kg PPP/ha)</p> <p>Legume vegetables French bean (max. 2.5 kg PPP/ha) Peas with pods (max. 2.5 kg PPP/ha)</p> <p>Table and wine grapes: Grape (max. 3 kg PPP/ha)</p> <p>Berries and small fruits: Currant (max. 3 kg PPP/ha)</p>
Model	<p>Martin S. et al. (2008) [Guidance for Exposure and Risk Evaluation for Bystanders and Residents Exposed to Plant Protection Products During and After Application; J. Verbr. Lebensm. 3 (2008): 272-281 Birkhäuser Verlag Basel] and Bundesanzeiger (BAnz), 06 January 2012, Issue No. 4, pp. 75-76.</p>

Table 6.6-77. Detailed calculations are in Appendix 3.

Table 6.6-6: Exposure models for intended uses

Critical uses	<p>Pome frutis: Apple, Pear, Quince, Medlar (max. 1.5 kg PPP/ha)</p> <p>Stone fruits: Cherry, sweet cherry (max. 3 kg PPP/ha) Apricot, Plum (max. 3 kg PPP/ha) Peach (max. 3 kg PPP/ha)</p> <p>Tree nuts Walnut, Hazelnut (max. 3 kg PPP/ha)</p> <p>Fruiting vegetables (outdoor): Tomato (max. 2.5 kg PPP/ha)</p>
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	<p>Aubergines (max. 2.5 kg PPP/ha) Cucumber (max. 2.5 kg PPP/ha) Gherkins (max. 2.5 kg PPP/ha) Courgette (max. 2.5 kg PPP/ha)</p> <p>Fruiting vegetables (indoor): Tomato (max. 3.6 kg PPP/ha) Aubergines (max. 3.6 kg PPP/ha) Cucumber (max. 2.3 kg PPP/ha) Melon (max. 3.6 kg PPP/ha) Pumpkins (max. 3.6 kg PPP/ha) Watermelon (max. 3.6 kg PPP/ha)</p> <p>Legume vegetables French bean (max. 2.5 kg PPP/ha) Peas with pods (max. 2.5 kg PPP/ha)</p> <p>Table and wine grapes: Grape (max. 3 kg PPP/ha)</p> <p>Berries and small fruits: Currant (max. 3 kg PPP/ha)</p>
Model	<p>Martin S. et al. (2008) [Guidance for Exposure and Risk Evaluation for Bystanders and Residents Exposed to Plant Protection Products During and After Application; J. Verbr. Lebensm. 3 (2008): 272-281 Birkhäuser Verlag Basel] and Bundesanzeiger (BA nz), 06 January 2012, Issue No. 4, pp. 75-76.</p>

Table 6.6-7: Estimated resident exposure (longer term exposure)

Model data	Total absorbed dose (mg/kg bw/day)	% of systemic AOEL	Total absorbed dose (mg/kg bw/day)	% of systemic AOEL
Pome frutis Apple, Pear, Quince, Medlar (early stage)				
	HCTM		HCHH	
Application rate	2 x 0.525 kg a.s./ha Multiple application rate: 0.9975 kg a.s./ha			
Bystanders (adult) Drift rate: 29.20 % (3 m) Body weight: 60 kg	0.0437	54.7 %	0.0438	54.7 %
Bystanders (children) Drift rate: 29.20 % (3 m) Body weight: 16.15 kg	0.0342	42.7 %	0.0342	42.8 %
Residents (adult) Drift rate: 29.20 % (3 m) Body weight: 60 kg	0.00347	4.3 %	0.00347	4.3 %
Residents (children) Drift rate: 29.20 % (3 m) Body weight: 16.15 kg	0.00699	8.7 %	0.00699	8.7 %
Pome frutis Apple, Pear, Quince, Medlar				

Stone fruits Cherry, Sweet cherry, Apricot, Plum (late stage)				
	HCTM		HCHH	
Application rate	2 x 0.525 kg a.s./ha Multiple application rate: 0.9975 kg a.s./ha			
Bystanders (adult) Drift rate: 15.73 % (3 m) Body weight: 60 kg	0.0236	29.5 %	0.0236	29.5 %
Bystanders (children) Drift rate: 15.73 % (3 m) Body weight: 16.15 kg	0.0184	23.0 %	0.0185	23.1 %
Residents (adult) Drift rate: 15.73 % (3 m) Body weight: 60 kg	0.0020	2.5 %	0.0020	2.5 %
Residents (children) Drift rate: 15.73 % (3 m) Body weight: 16.15 kg	0.0040	5 %	0.0040	5 %
Stone fruits Cherry, sweet cherry, apricot, plum (Fruit crops, late stage)				
	HCTM		HCHH	
Application rate	1 x 1.05 kg a.s./ha			
Bystanders (adult) Drift rate: 15.73% (2-3 m) Body weight: 60 kg	0.0248	31 %	0.0248	31 %
Bystanders (children) Drift rate: 15.73% (2-3 m) Body weight: 16.15 kg	0.0194	24.3 %	0.0195	24.4 %
Residents (adult) Drift rate: 15.73% (2-3 m) Body weight: 60 kg	0.0021	2.6 %	0.0021	2.6 %
Residents (children) Drift rate: 15.73% (2-3 m) Body weight: 16.15 kg	0.0042	5.2 %	0.0042	5.2 %
Tree nuts Walnut, Hazelnut (Fruit crops, early stage)				
	HCTM		HCHH	
Application rate	2 x 1.05 kg a.s./ha Multiple application rate: 1.89 kg a.s./ha			
Bystanders (adult) Drift rate: 19.89 % (5 m) Body weight: 60 kg	0.0565	70.6 %	0.0565	70.7 %
Bystanders (children) Drift rate: 19.89 % (5 m) Body weight: 16.15 kg	0.044	55.2 %	0.0443	55.3 %
Residents (adult)	0.0044	5.5 %	0.0044	5.5 %

Drift rate: 19.89 % (5 m) Body weight: 60 kg				
Residents (children) Drift rate: 19.89 % (5 m) Body weight: 16.15 kg	0.0089	11.1 %	0.0089	11.1 %
Fruiting vegetables (outdoor): Tomato, Aubergines, Cucumber, Gherkins, Courgette (Field crop)				
Fruiting vegetables (indoor): Tomato, Aubergines, Melon, Pumpkins, Watermelon				
	FCTM		HCHH	
Application rate	3 x 0.875 kg a.s./ha Multiple application rate: 2.275 kg a.s./ha			
Bystanders (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.029	36.3 %	0.0292	36.5 %
Bystanders (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.0227	28.3 %	0.0230	28.7 %
Residents (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.00240	3 %	0.00240	3 %
Residents (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.00481	6 %	0.00481	6 %
Fruiting vegetables (indoor): Cucumber				
	FCTM		HCHH	
Application rate	4 x 0.800 kg a.s./ha Multiple application rate: 2.56 kg a.s./ha			
Bystanders (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.0327	40.8%	0.033	41%
Bystanders (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.0255	31.9 %	0.0258	32.3 %
Residents (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.00266	3.3 %	0.00266	3.3 %
Residents (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.00535	6.7 %	0.0053	6.7 %
Legume vegetables: French bean, Peas with pods, Bean with pods (Field crops)				

	FCTM		HCHH	
Application rate	3 x 0.875 kg a.s./ha Multiple application rate: 2.275 kg a.s./ha			
Bystanders (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.029	36.3 %	0.0292	36.5 %
Bystanders (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.0226	28.3 %	0.0230	28.7 %
Residents (adult) Drift rate: 8.5 % (2-3 m) Body weight: 60 kg	0.00240	3 %	0.00240	3 %
Residents (children) Drift rate: 8.5 % (2-3 m) Body weight: 16.15 kg	0.0048	6 %	0.0048	6 %
Table and wine grapes: Grape				
	HCTM		HCHH	
Application rate	3 x 1.05 kg a.s./ha Multiple application rate: 2.52 kg a.s./ha			
Bystanders (adult) Drift rate: 8.02% (2-3 m) Body weight: 60 kg	0.0304	38 %	0.0305	38.1 %
Bystanders (children) Drift rate: 8.02% (2-3 m) Body weight: 16.15 kg	0.0238	29.8 %	0.0240	30 %
Residents (adult) Drift rate: 8.02% (2-3 m) Body weight: 60 kg	0.00249	3.1 %	0.00249	3.1 %
Residents (children) Drift rate: 8.02% (2-3 m) Body weight: 16.15 kg	0.0050	6.3 %	0.0050	6.3 %
Berries and small fruits: Currant				
	HCTM		HCHH	
Application rate	2 x 1.05 kg a.s./ha Multiple application rate: 1.89 kg a.s./ha			
Bystanders (adult) Drift rate: 15.73% (2-3 m) Body weight: 60 kg	0.0447	55.8 %	0.0447	55.9 %
Bystanders (children) Drift rate: 15.73% (2-3 m) Body weight: 16.15 kg	0.0349	43.7%	0.0350	43.8%
Residents (adult) Drift rate: 15.73% (2-3 m) Body weight: 60 kg	0.00353	4.4 %	0.00353	4.4 %

Residents (children) Drift rate: 15.73% (2-3 m) Body weight: 16.15 kg	0.0071	8.9 %	0.0071	8.9 %
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Calculation presented for Tractor- Mounted and Hand-held sprayer covered calculation for Home garden application. Data for Tractor Mounted and Hand held application presented worst case scenario.

The resident and bystander (adult and children) exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) for copper will not be exceeded AOEL under conditions of intended uses. Buffer zone 2-3 m

6.6.4.2 Measurement of resident and/or bystander exposure

Since the resident and bystander exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) for copper will not be exceeded under conditions of intended uses and considering above mentioned risk mitigation measures, a study to provide measurements of resident/bystander exposure was not necessary and was therefore not performed.

6.6.5 Combined exposure

Not relevant. The product contains only one active substance.

Appendix 1 Lists of data considered in support of the evaluation

Tables considered not relevant can be deleted as appropriate.

MS to blacken authors of vertebrate studies in the version made available to third parties/public.

List of data submitted by the applicant and relied on, already evaluated at national level

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 7.1.1	xxx	2006	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part I. Acute oral toxicity study for rats. xxx Study code: OS-16-05. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.
KCP 7.1.2	xxx	2006	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part II. Acute dermal toxicity study for rats. xxx Study code: OS-16-05. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.
KCP 7.1.3	xxx	2007	MIEDZIAN EXTRA 350 SC: Acute inhalation to study (nose only) in the rat. Study code: 06/237-004P. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.
KCP 7.1.4	xxx	2006	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part III. Acute skin irritation/ corrosion for rabbits. xxx Study code: OS-16-05. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 7.1.5	xxx	2006	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part I.V Acute eye irritation/ corrosion study for rabbits. xxx Study code: OS-16-05. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.
KCP 7.1.6	xxx	2006	Miedzian Extra 350 S.C. - Skin sensition test. Study code: AI-25-05. xxx GLP Unpublished	Y	Synthos Agro Sp z o.o.

List of data submitted or referred to by the applicant and relied on, but already evaluated at EU peer review

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 7.3	xxx	2012	In vitro dermal absorption of copper (Cu) from 8 formulations through human skin V9062 xxx OECD 428, April 2004 Yes No	N	EUCuTF
KCP 7.3	xxx	2015	In vitro percutaneous absorption of copper, formulated as Copper hydroxide 50 WP or Copper oxychloride SC, through human and rat skin V20600/19	N	EUCuTF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			xxx OECD 428, April 2004 Yes No		

The following tables are to be completed by MS

List of data submitted by the applicant and not relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner

List of data relied on not submitted by the applicant but necessary for evaluation

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner

Appendix 2 Detailed evaluation of the studies relied upon

A 2.1 Statement on bridging possibilities

Comments of zRMS:	N/A
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A 2.2 Acute oral toxicity (KCP 7.1.1)

Comments of zRMS:	Under the experimental conditions, the oral LD₅₀ of MIEDZIAN EXTRA 350 SC is higher than 300 mg/kg bw and lower than 2000 mg/kg bw in rats. Thus, classification is required according to Regulation (EC) No. 1272/2008. MIEDZIAN EXTRA 350 SC is classified– Acute Tox. 4 /H302.
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Reference	KCP 7.1.1
Report	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part II. Acute dermal toxicity study for rats. xxx 2006.OS-16-05.
Guideline(s)	OECD No. 420/ Method B. 1 .BIS
Deviations	No
GLP	Yes
Acceptability	Yes
Duplication (if vertebrate study)	No
Previously evaluated:	Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	MIEDZIAN EXTRA 350 SC (Batch No 1/11/2005)
Species	Wistar Rat
No. of animals (group size)	10 rats/sex
Doses	300, 2000 [mg/kg bw]
Exposure	Once by gavage
Vehicle/Dilution	Distilled water
Post exposure observation period	14 days
Remarks	None

Results and discussions

Table A 1: Results of acute oral toxicity study in rats of MIEDZIAN EXTRA 350 SC

Dose (mg/kg bw)	Toxicological results *	Duration of signs	Time of death	LD ₅₀ (mg/kg bw) (14 days)
Female rats				
2000	2/0/5	2 nd – 11 th day	5 th and 7 th day	< 2000
300	0/0/5	-	-	>300

* Number of animals which died/number of animals with clinical signs/number of animals used

Table A 2: Summary of findings of acute oral toxicity study in rats of MIEDZIAN EXTRA 350 SC

Mortality	Yes.
Clinical signs	Yes, in dose 2000 mg/kg bw: changes in body posture, locomotion, reactivity, bristled fur and urination, changes.
Body weight	Body weight gain was considered to be normal. In dose 2000 mg/kg bw: body weight decrease (1 animal).
Macroscopic examination	In dose 2000 mg/kg bw: lung abscesses (1 animal). In dose 300 mg/kg bw: any pathological changes.

Conclusion

Under the experimental conditions, the oral LD₅₀ of MIEDZIAN EXTRA 350 SC is higher than 300 mg/kg bw and lower than 2000 mg/kg bw in rats. Thus, classification is required according to Regulation (EC) No. 1272/2008. MIEDZIAN EXTRA 350 SC can be classified as category 4 – **Acute Tox. 4 (H302)**.

A 2.3 Acute percutaneous (dermal) toxicity (KCP 7.1.2)

Comments of zRMS:	Under the experimental conditions, the dermal LD₅₀ of MIEDZIAN EXTRA 350 SC is higher than 2000 mg/kg bw in rats. Thus, no classification is required according to Regulation (EC) No. 1272/2008.
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A 2.3.1 Study 1

Reference	KCPA 7.1.2
Report	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part II. Acute dermal toxicity study for rats. xxx 2006. OS-16-05.
Guideline(s)	OECD 402 (1987), EU method B.3 (92/69/EEC).
Deviations	No
GLP	Yes
Acceptability	Yes
Duplication (if vertebrate study)	No

Previously evaluated: Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	Miedzian Extra 350 SC (Batch No 1/11/2005)
Species	Rat
No. of animals (group size)	10 rats (5 males and 5 female)
Dose(s)	2000 mg/kg bw
Exposure	24 hours (dermal)
Vehicle/Dilution	None
Post exposure observation period	14 days
Remarks	None

Results and discussions

Table A 3: Results of acute dermal toxicity study in rats of MIEDZIAN EXTRA 350 SC

Dose (mg/kg bw)	Toxicological results *	Duration of signs	Time of death	LD₅₀ (mg/kg bw) (14 days)
Male rats				
2000	0/0/5	-	-	> 2000
Female rats				
2000	0/0/5	-	-	> 2000

* Number of animals which died/number of animals with clinical signs/number of animals used

Table A 4: Summary of findings of acute dermal toxicity study in rats of MIEDZIAN EXTRA 350 SC

Mortality	No mortality occurred.
Clinical signs	No clinical signs of toxicity were observed.
Body weight	Body weight gain was considered to be normal.
Macroscopic examination	The necropsies performed at the end of the study revealed no apparent findings.

The original acute Dermal Toxicity Guideline TG 402 was adopted in 1987. In 2017 OECD Guideline for the Testing of Chemicals No. 402 was updated, but the methodology of the test was not changed.

Conclusion

Under the experimental conditions, the dermal LD₅₀ of MIEDZIAN EXTRA 350 SC is higher than 2000 mg/kg bw in rats. Thus, no classification is required according to Regulation (EC) No. 1272/2008.

A 2.4 Acute inhalation toxicity (KCP 7.1.3)

Comments of zRMS:	Under the experimental conditions, the inhalation LC₅₀ of MIEDZIAN EXTRA 350 SC is higher than 2.13 mg/L air/4h in rats. Thus, classification is required according to Regulation (EC) No. 1272/2008. MIEDZIAN EXTRA 350 SC is classified as Acute Tox. 4 /H332.
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A 2.4.1 Study 1

Reference	KCP 7.1.3
Report	MIEDZIAN EXTRA 350 SC: Acute inhalation to study (nose only) in the rat. xxx 2007. Study code: 06/237-004P.
Guideline(s)	OECD 403 (1981), EU method B.2 (92/69/EEC), OPPTS 870.1300.
Deviations	No
GLP	Yes
Acceptability	Yes
Duplication (if vertebrate study)	No
Previously evaluated:	Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	MIEDZIAN EXTRA 350 SC (Batch No 1 and 7)
Species	Wistar CrI: (WI) BR strain Rat
No. of animals (group size)	10 rats/sex/dose
Concentration(s)	2.13 mg/L air
Exposure	4 hours (nose only)
Vehicle/Dilution	Distilled water (50:50, w/w)
Post exposure observation period	14 days
Remarks	None

Results and discussions

Table A 5: Concentration(s) and exposure conditions

Target conc. (mg/L air)	or	Nominal conc. (mg/L air)	MMAD * (µm)	GSD ** (µm)
2.13		87.5	4.92	3.38

* MMAD = Mass Median Aerodynamic Diameter

** GSD = Geometric Standard Deviation

Table A 6: Results of acute inhalation toxicity study in rats of

Concentration (mg/L air)	Toxicological results *	Duration of signs	Time of death	LC ₅₀ (mg/L air) (14 days)
Male rats				

Concentration (mg/L air)	Toxicological results *	Duration of signs	Time of death	LC ₅₀ (mg/L air) (14 days)
2.13	0/5/5	1 st day	-	> 2.13
Female rats				
2.13	0/5/5	1 st day	-	> 2.13

* Number of animals which died/number of animals with clinical signs/number of animals used

Table A 7: Summary of findings of acute inhalation toxicity study in rats of MIEDZIAN EXTRA 350 SC

Mortality	No mortality occurred.
Clinical signs	Yes: increased respiratory rate and/or laboured respiration (during and up to one-hour after exposure), intermittent tremors (only after 3 hours exposure) and hunched posture (1 animal). All animals recovered quickly from the effects of exposure with no significant clinical signs recorded on Day 1 post-exposure and all animals appeared normal from Day 2.
Body weight	Body weight gain was considered to be normal.
Macroscopic examination	No macroscopic abnormalities were detected at necropsy that were considered to be treatment related.

In 2009 OECD Guideline for the Testing of Chemicals No. 403 was updated, but the methodology of the test was not changed. The original acute inhalation Test Guideline 403 was adopted in 1981. Revised Test Guideline 403 (TG 403) has been designed to be more flexible, to reduce animal usage, and to fulfil regulatory needs. The revised TG 403 features two study types: a Traditional LC₅₀ protocol and a Concentration x Time (C x t) protocol.

Conclusion

Under the experimental conditions, the inhalation LC₅₀ of MIEDZIAN EXTRA 350 SC is higher than 2.13 mg/L air/4h in rats. Thus, classification is required according to Regulation (EC) No. 1272/2008. MIEDZIAN EXTRA 350 SC can be classified as category 4 – **Acute Tox. 4 (H332)**.

A 2.5 Skin irritation (KCP 7.1.4)

Comments of zRMS:	Under the experimental conditions, MIEDZIAN EXTRA 350 SC is not a skin irritant. Thus, no classification is required according to Regulation (EC) No. 1272/2008.
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A 2.5.1 Study 1

Reference	IIIA 7.1.4
Report	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part III. Acute skin irritation/ corrosion for rabbits. xxx 2006. OS-16-05.
Guideline(s)	OECD 404 (2002), EU method B.4 (2004/73/EC).
Deviations	No
GLP	Yes
Acceptability	Yes

Duplication (if vertebrate study) No
Previously evaluated: Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	MIEDZIAN EXTRA 350 SC (Batch No 1/11/2005)
Species	Rabbit, New Zealand White
No. of animals (group size)	3 females
Initial test using one animal	Yes
Exposure	0.5 mL (4 hours, semi-occlusive)
Vehicle/Dilution	Undiluted test material
Post exposure observation period	14 days
Remarks	None

Results and discussions

Table A 8: Skin irritation of MIEDZIAN EXTRA 350 SC

Animal No.		Scores after treatment *				Mean scores (24-72 h)	Reversible (day)
		1 h	24 h	48 h	72 h		
1	Erythema	1	1	0	0	0.3	2 nd
	Oedema	0	0	0	0	0	-
2	Erythema	1	0	0	0	0	-
	Oedema	0	0	0	0	0	-
3	Erythema	1	1	0	0	0.3	2 nd
	Oedema	0	0	0	0	0	-

* scores in the range of 0 to 4

During observation rabbits showed changes on skin in a from very weak (barely visible erythema).

Clinical signs:	No clinical signs of toxicity were observed.
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In 2015 OECD Guideline for the Testing of Chemicals No. 404 was updated, but the methodology of the test was not changed. Updated version of Guideline 404 (originally adopted in 1981, revised in 1992, 2002 and 2015) includes reference to the Guidance Document on Integrated Approaches to Testing and Assessment (IATA) for Skin Irritation/Corrosion (1), proposing a modular approach for skin irritation and skin corrosion testing.

Conclusion

Under the experimental conditions, MIEDZIAN EXTRA 350 SC is **not a skin irritant**. Thus, no classification is required according to Regulation (EC) No. 1272/2008.

A 2.6 Eye irritation (KCP 7.1.5)

Comments of zRMS:	Under the experimental conditions, MIEDZIAN EXTRA 350 SC is an eye irritant. Thus, according to Regulation (EC) No. 1272/2008 is classified as Eye
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	Irrit. 2 /H319,
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A 2.6.1 Study 1

Reference	KCP 7.1.5
Report	MIEDZIAN EXTRA 350 SC Acute toxicity studies. Part I.V Acute eye irritation/ corrosion study for rabbits. xxx 2006. OS-16-05.
Guideline(s)	OECD 405 (2002), EU method B.5 (2004/73/EC).
Deviations	No.
GLP	Yes.
Acceptability	Yes.
Duplication (if vertebrate study)	No.
Previously evaluated:	Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	MIEDZIAN EXTRA 350 SC (Batch No 1/11/2005)
Species	Rabbit, New Zealand White
No. of animals (group size)	2 females
Initial test using one animal	Yes
Exposure	0.1 mL (single instillation in conjunctival sac)
Vehicle/Dilution	Undiluted test material
Post exposure observation period	21 days
Remarks	None

Results and discussions

Table A 9: Eye irritation of MIEDZIAN EXTRA 350 SC

Animal No.		Scores after treatment *							Mean scores (24-72 h)
		1 h	24 h	48 h	72 h	7 days	14 days	21 days	
1	Corneal opacity	0	2	2	2	1	1	0	2
	Iritis	0	1	1	1	0	0	0	1
	Redness conjunctivae	2	3	3	3	1	1	0	3
	Chemosis conjunctivae	2	3	3	2	2	0	0	2.7
2	Corneal opacity	1	2	2	2	0	0	-	2
	Iritis	1	1	1	1	0	0	-	1
	Redness conjunctivae	2	3	3	3	1	0	-	3
	Chemosis conjunctivae	2	3	3	2	2	0	-	2.7

* scores in the range of 0 to 4 for cornea opacity and chemosis, 0 to 3 for redness of conjunctivae and 0 to 2 for iritis

Clinical signs:	After 21 days: No clinical signs of toxicity were observed.
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In 2020 OECD Guideline for the Testing of Chemicals No. 405 was updated, but the methodology of the

test was not changed. Revised Test Guideline (adopted in 1981 and updated in 1987, 2002, and 2012) includes the recommendation that prior to undertaking the described *in vivo* test for acute eye irritation/corrosion, a weight-of-the-evidence analysis be performed on the existing relevant data.

Conclusion

Under the experimental conditions, MIEDZIAN EXTRA 350 SC is an eye irritant. Thus, be classified as category 2 – **Eye Irrit. 2 (H319)**, according to Regulation (EC) No. 1272/2008, Table 3.3.2.

A 2.7 Skin sensitisation (KCP 7.1.6)

Comments of zRMS:	Under the experimental conditions, MIEDZIAN EXTRA 350 SC is a skin sensitizer, should be classified as moderate sensitizer for guinea pigs. Thus, classification is required according to Regulation (EC) No. 1272/2008 MIEDZIAN EXTRA 350 SC is classified as Skin Sens. 1/H317 .
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A 2.7.1 Study 1

Reference	KCP 7.1.6
Report	MIEDZIAN EXTRA 350 S.C. Skin sensitization test. xxx 2006. AI-25-05.
Guideline(s)	OECD 406 (1992), EU method B.6 (96/54/EEC)
Deviations	No
GLP	Yes
Acceptability	Yes
Duplication (if vertebrate study)	No
Previously evaluated:	Yes, in 2014.

Materials and methods

Test material (Lot/Batch No.)	Miedzian Extra 350 SC (Batch No 1/11/2005)
Species	Guinea pig
No. of animals (group size)	Test substance group: 10 male and 10 female guinea pigs Vehicle control group: 4 male and 6 female guinea pigs
Exposure (concentration(s), no. of applications)	Intradermal induction: test material in concentration of 0.05 % with Freund Complete Adjuvant Topical induction: at concentrations of 50%. Challenging: at concentrations of 50%.
Vehicle	aqueous suspension (distilled water)
Pretreatment prior to topical application	The animals in the preliminary experiment are given intradermal complete Freund's adjuvant.

Results and discussions

Table A 10: Results of skin sensitisation study of product code/name

	24 hours	48 hours	72 hours	Total number of animals affected
	After challenge			
MIEDZAIN EXTRA 350 SC	7/20	8/20	7/20	40 %
Test vehicle control group	0/10	0/10	0/10	0 %

* Number of animals with positive dermal response (scores of 1-3) /number of animals in dose group

Clinical signs:	No clinical signs of toxicity were observed.
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Conclusion

Under the experimental conditions, MIEDZIAN EXTRA 350 SC is a skin sensitizer, should be classified as moderate sensitizer for guinea pigs. Thus, classification is required according to Regulation (EC) No. 1272/2008 (Table 3.4.3). MIEDZIAN EXTRA 350 SC can be classified as category 2 – **Skin Sens. 1 (H317)**.

A 2.8 Supplementary studies for combinations of plant protection products (KCP 7.1.7)

A 2.9 Data on co-formulants (KCP 7.4)

A 2.9.1 Material safety data sheet for each co-formulant

Information regarding material safety data sheets of the co-formulants can be found in the confidential dossier of this submission (Registration Report - Part C).

A 2.9.2 Available toxicological data for each co-formulant

Available toxicological data for each co-formulant can be found in the confidential dossier of this submission (Registration Report - Part C).

A 2.10 Studies on dermal absorption (KCP 7.3)

According requirements from Reg. No. 284/2013/WE the study shall be conducted when dermal exposure is a significant exposure route and no acceptable risk is estimated using default absorption value.

In order to make assessment of exposure, Applicant has proposed for MIEDZIAN EXTRA 350 SC a default dermal absorption value of 1% for the concentrate and 9% for the spray solution.

Based on study presented in the RAR (Maas, W.J.M. (2012) and Maas, W.J.M. and Kunne, C. (2015)), it is proposed copper dermal absorption values of 1% and 9%, for the concentrate and the field dilution (0.33g Cu/L), respectively. These dermal absorption values cover all the formu-

lations tested and thus can be applicable for all chemical form of copper and all type of copper formulations.

Use of plant protection product MIEDZIAN EXTRA 350 SC is safe for operator, taking into account proposed dose of product, type of usage, type of personal protective equipment (gloves, protective garment and sturdy footwear, head and head respiratory PPE). Using tractor mounted boom sprayer, knapsack sprayer and maintain general rules of safety and hygiene of working with plant protection products and comply with requirements enclosed in label, risk during employ MIEDZIAN EXTRA 350 SC is acceptable, absorbed dose of copper have safe value, below AOEL for this active ingredient.

According to above there isn't necessity to do tests of dermal absorption for MIEDZIAN EXTRA 350 SC.

Acceptable

A 2.11 Other/Special Studies

Appendix 3 Exposure calculations

A 3.1 Operator exposure calculations (KCP 7.2.1.1)

A 3.1.1 Calculations for copper

A. Professional user

Pome frutis Apple, pear, Quince, Medlar

Table A 11: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Pome fruits
Application rate (AR)	0.525	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Vehicle-mounted
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	Yes
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 12: Estimation of acute operator exposure towards active substance according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for MIBZIAN EXTRA 550 SL: outdoor spray applications					
Application rate of active substance		0,525 kg a.s./ha	i_AppRate		
Assumed area treated		10 ha/day	d_AreaTreated		
Amount of active substance applied		5,25 kg a.s./day	i_AmountAS		
Dermal absorption of the product		1,00%	i_AbsorpProduct		
Dermal absorption of in-use dilution		9,00%	i_AbsorInuse		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Upward spraying			
Application equipment		Vehicle-mounted			
Season		late (dense foliage)			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingVehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	17408	64727	AOEM	
	Body	11443	116601	AOEM	
	Head	272	1494	AOEM	
	Protected hands (gloves)	101	1040	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	103	768	AOEM	
	Protected head (hood and face shield)	4	85	AOEM	
	Inhalation	6	30	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
Head and respiratory PPE	None		1	1	
Water soluble bag	No		1		
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	5750	10897	AOEM	No data available for a drift reduction scenario
	Body	15417	43857	AOEM	
	Head	79	1021	AOEM	
	Protected hands (gloves)	185	4004	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	357	844	AOEM	
	Inhalation	25	110	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	2,2343766	1,5604209
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0372396	0,0260070
% of RVNAS	46,55%	32,51%

Table A 13: Input parameters considered for the estimation of operator exposure

Formulation type	SC	Crop type	Pome fruits
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Application rate (AR)	0.525	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	1	ha	Application equipment	Manual - Knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 14: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for MIBDZIAN EXTRA 350 S.C. outdoor spray applications					
Application rate of active substance		0,525 kg a.s./ha		i_AppRate	
Assumed area treated		1 ha/day		d_AreaTreated	
Amount of active substance applied		0,525 kg a.s./day		i_AmountAS	
Dermal absorption of the product		1,00%		i_AbsorpProduct	
Dermal absorption of in-use dilution		9,00%		i_AbsorInuse	
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Upward spraying			
Application equipment		Manual-Knapsack			
Season		late (dense foliage)			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingManual-Knapsack					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	10635	15854	AOEM	No data available for a drift reduction scenario
	Body	1091841	2175558	AOEM	
	Head	1530	2577	AOEM	
	Protected hands (gloves)	96	213	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	86	227	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	99,5747816	4,3009082
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,6595797	0,0716818
% of RVNAS	2074,47%	89,60%

Stone frutis

Cherry, sweet cherry, apricot, plum, peach

Table A 15: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Stone fruits
Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	Yes and No

Table A 16: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for MEDIAN EXTRA 550 SL for outdoor spray applications					
Application rate of active substance	1,05 kg a.s./ha		i_AppRate		
Assumed area treated	10 ha/day		d_AreaTreated		
Amount of active substance applied	10,5 kg a.s./day		i_AmountAS		
Dermal absorption of the product	1,00%		i_AbsorpProduct		
Dermal absorption of in-use dilution	9,00%		i_AbsorInuse		
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.				
Indoor or Outdoor application	Outdoor				
Application method	Upward spraying				
Application equipment	Vehicle-mounted				
Season	late (dense foliage)				
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingVehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	29683	111041	AOEM	
	Body	18628	142613	AOEM	
	Head	545	2988	AOEM	
	Protected hands (gloves)	159	2080	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	191	1536	AOEM	
	Protected head (hood and face shield)	9	169	AOEM	
	Inhalation	7	30	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	10632	21794	AOEM	No data available for a drift reduction scenario
	Body	30835	87714	AOEM	
	Head	157	2042	AOEM	
	Protected hands (gloves)	369	8008	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	714	1688	AOEM	
	Inhalation	37	220	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	4,2790397	3,0601632
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0713173	0,0510027
% of RVNAS	89,15%	63,75%

Table A 17: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Stone fruits
Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Manual -Knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 18: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	1,05 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	1,05 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Manual-Knapsack	
Season	late (dense foliage)	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario
	Body	1216961	2189719	AOEM	
	Head	1911	3234	AOEM	
	Protected hands (gloves)	192	426	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	153	344	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	111,6888485	4,4111064
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,8614808	0,0735184
% of RVNAS	2326,85%	91,90%

Table A 19: Estimation of longer term operator exposure towards copper according to EFSA guidance – with head and respiratory PPE

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for immediate extensive outdoor spray applications					
Application rate of active substance		1,05 kg a.s./ha	i_AppRate		
Assumed area treated		1 ha/day	d_AreaTreated		
Amount of active substance applied		1,05 kg a.s./day	i_AmountAS		
Dermal absorption of the product		1,00%	i_AbsorpProduct		
Dermal absorption of in-use dilution		9,00%	i_AbsorInuse		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Upward spraying			
Application equipment		Manual-Knapsack			
Season		late (dense foliage)			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingManual-Knapsack					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
Water soluble bag	No		1		
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario
	Body	1216961	2189719	AOEM	
	Head	1911	3234	AOEM	
	Protected hands (gloves)	192	426	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	153	344	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	FP1, P1 and similar		0,8	0,25
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	111,6888485	4,2615836
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,8614808	0,0710264
% of RVNAS	2326,85%	88,78%

Stone fruits

Cherry, sweet cherry, apricot, plum

Table A 20: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Stone fruits
Application rate (AR)	0.525	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 21: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for: Water-soluble concentrates, emulsifiable concentrates, etc. Outdoor spray applications					
Application rate of active substance		0,525 kg a.s./ha	<i>i_AppRate</i>		
Assumed area treated		10 ha/day	<i>d_AreaTreated</i>		
Amount of active substance applied		5,25 kg a.s./day	<i>i_AmountAS</i>		
Dermal absorption of the product		1,00%	<i>i_AbsorpProduct</i>		
Dermal absorption of in-use dilution		9,00%	<i>i_AbsorInuse</i>		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Upward spraying			
Application equipment		Vehicle-mounted			
Season		late (dense foliage)			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingVehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	17408	64727	AOEM	
	Body	11443	116601	AOEM	
	Head	272	1494	AOEM	
	Protected hands (gloves)	101	1040	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	103	768	AOEM	
	Protected head (hood and face shield)	4	85	AOEM	
	Inhalation	6	30	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	5750	10897	AOEM	No data available for a drift reduction scenario
	Body	15417	43857	AOEM	
	Head	79	1021	AOEM	
	Protected hands (gloves)	185	4004	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	357	844	AOEM	
	Inhalation	25	110	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	2,2343766	1,5604209
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0372396	0,0260070
% of RVNAS	46,55%	32,51%

Table A 22: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Stone fruits
Application rate (AR)	0.525	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Manual knapsack
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 23: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	0,525 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	0,525 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Manual-Knapsack	
Season	late (dense foliage)	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	10635	15854	AOEM	No data available for a drift reduction scenario
	Body	1091841	2175558	AOEM	
	Head	1530	2577	AOEM	
	Protected hands (gloves)	96	213	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	86	227	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	99,5747816	4,3009082
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,6595797	0,0716818
% of RVNAS	2074,47%	89,60%

Tree nuts Walnut, Hazelnut

Table A 24: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Tree nuts
Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Vehicle -mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 25: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for: mixed and emulsifiable concentrates spray applications					
Application rate of active substance		1,05 kg a.s./ha	i_AppRate		
Assumed area treated		10 ha/day	d_AreaTreated		
Amount of active substance applied		10,5 kg a.s./day	i_AmountAS		
Dermal absorption of the product		1,00%	i_AbsorpProduct		
Dermal absorption of in-use dilution		9,00%	i_AbsorInuse		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Upward spraying			
Application equipment		Vehicle-mounted			
Season		late (dense foliage)			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingVehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	29683	111041	AOEM	
	Body	18628	142613	AOEM	
	Head	545	2988	AOEM	
	Protected hands (gloves)	159	2080	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	191	1536	AOEM	
	Protected head (hood and face shield)	9	169	AOEM	
	Inhalation	7	30	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	10632	21794	AOEM	No data available for a drift reduction scenario
	Body	30835	87714	AOEM	
	Head	157	2042	AOEM	
	Protected hands (gloves)	369	8008	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	714	1688	AOEM	
	Inhalation	37	220	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	4,2790397	3,0601632
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0713173	0,0510027
% of RVNAS	89,15%	63,75%

Table A 26: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Tree nuts
Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	1	ha	Application equipment	Manual knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 27: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	1,05 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	1,05 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Manual-Knapsack	
Season	late (dense foliage)	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario
	Body	1216961	2189719	AOEM	
	Head	1911	3234	AOEM	
	Protected hands (gloves)	192	426	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	153	344	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	111,6888485	4,4111064
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,8614808	0,0735184
% of RVNAS	2326,85%	91,90%

Table A 28: Estimation of longer term operator exposure towards copper according to EFSA guidance – with head and respiratory PPE

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for mixed use applications					
Application rate of active substance	1,05	kg a.s./ha	<i>i_AppRate</i>		
Assumed area treated	1	ha/day	<i>d_AreaTreated</i>		
Amount of active substance applied	1,05	kg a.s./day	<i>i_AmountAS</i>		
Dermal absorption of the product	1,00%		<i>i_AbsorpProduct</i>		
Dermal absorption of in-use dilution	9,00%		<i>i_AbsorInuse</i>		
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.				
Indoor or Outdoor application	Outdoor				
Application method	Upward spraying				
Application equipment	Manual-Knapsack				
Season	late (dense foliage)				
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Upward sprayingManual-Knapsack					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario
	Body	1216961	2189719	AOEM	
	Head	1911	3234	AOEM	
	Protected hands (gloves)	192	426	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	153	344	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	FP1, P1 and similar		0,8	0,25
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	111,6888485	4,2615836
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,8614808	0,0710264
% of RVNAS	2326,85%	88,78%

Fruiting vegetables (outdoor)

Tomato, Aubergines, Cucumber, Gherkins, Courgette

Table A 29: Input parameters considered for the estimation of operator exposure

Formulation type	SC	Crop type	Fruiting vegetables
Application rate (AR)	0.875 kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	50 ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1 % (concentr.)	Indoor/outdoor	Outdoor
	9 % (dilution)	Closed cabin	No
Inhalation absorption (IA)	100 %	Drift reduction	No
Body weight (BW)	60 kg/person	Cultivation	Normal
AOEL	0.08 mg/kg bw/d	Water soluble bag	No

Table A 30: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for MIBZIAN EXTRA 350 SL: outdoor spray applications					
Application rate of active substance		0,875 kg a.s./ha		<i>i_AppRate</i>	
Assumed area treated		50 ha/day		<i>d_AreaTreated</i>	
Amount of active substance applied		43,75 kg a.s./day		<i>i_AmountAS</i>	
Dermal absorption of the product		1,00%		<i>i_AbsorpProduct</i>	
Dermal absorption of in-use dilution		9,00%		<i>i_AbsorInuse</i>	
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Downward spraying			
Application equipment		Vehicle-mounted			
Season		not relevant			
OutdoorSoluble concentrates, emulsifiable concentrate, etc. Downward sprayingVehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	89050	337357	AOEM	
	Body	50795	215885	AOEM	
	Head	2270	12449	AOEM	
	Protected hands (gloves)	403	8665	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	677	6398	AOEM	
	Protected head (hood and face shield)	36	705	AOEM	
	Inhalation	11	31	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	6489	36478	AOEM	
	Body	3628	18704	AOEM	
	Head	171	517	AOEM	
	Protected hands (gloves)	330	5178	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	100	244	AOEM	
	Inhalation	7	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	Yes		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	2,3654278	0,9246130
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0394238	0,0154102
% of RVNAS	49,28%	19,26%

Table A 31: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Fruiting vegetables
Application rate (AR)	0.875	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	1	ha	Application equipment	Manual knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 32: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	0,875 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	0,875 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Downward spraying	
Application equipment	Manual-Knapsack	
Season	not relevant	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	1544	4213	AOEM	
	Body	88868	137007	AOEM	
	Head	12	85	AOEM	
	Protected hands (gloves)	5	22	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	8903	62630	AOEM	
	Inhalation	26	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	8,2921900	0,8542800
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,1382032	0,0142380
% of RVNAS	172,75%	17,80%

Legume vegetables

French bean, Peas with pods, Bean with pods

Table A 33: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Legume vegetables
Application rate (AR)	0.875	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	50	ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 34: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance		0,875 kg a.s./ha	i_AppRate		
Assumed area treated		50 ha/day	d_AreaTreated		
Amount of active substance applied		43,75 kg a.s./day	i_AmountAS		
Dermal absorption of the product		1,00%	i_AbsorpProduct		
Dermal absorption of in-use dilution		9,00%	i_AbsorInuse		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.			
Indoor or Outdoor application		Outdoor			
Application method		Downward spraying			
Application equipment		Vehicle-mounted			
Season		not relevant			
		OutdoorSoluble concentrates, emulsifiable concentrate, etc. Downward sprayingVehicle-mounted			
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	89050	337357	AOEM	
	Body	50795	215885	AOEM	
	Head	2270	12449	AOEM	
	Protected hands (gloves)	403	8665	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	677	6398	AOEM	
	Protected head (hood and face shield)	36	705	AOEM	
	Inhalation	11	31	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	6489	36478	AOEM	
	Body	3628	18704	AOEM	
	Head	171	517	AOEM	
	Protected hands (gloves)	330	5178	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	100	244	AOEM	
	Inhalation	7	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	2,3654278	0,9246130
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0394238	0,0154102
% of RVNAS	49,28%	19,26%

Table A 35: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Legume vegetables
Application rate (AR)	0.875	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	1	ha	Application equipment	Manual knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 36: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	0,875 kg a.s./ha	i_AppRate
Assumed area treated	1 ha/day	d_AreaTreated
Amount of active substance applied	0,875 kg a.s./day	i_AmountAS
Dermal absorption of the product	1,00%	i_AbsorpProduct
Dermal absorption of in-use dilution	9,00%	i_AbsorInuse
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Downward spraying	
Application equipment	Manual-Knapsack	
Season	not relevant	
	OutdoorSoluble concentrates, emulsifiable concentrate, etc. Downward sprayingManual-Knapsack	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	1544	4213	AOEM	
	Body	88868	137007	AOEM	
	Head	12	85	AOEM	
	Protected hands (gloves)	5	22	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	8903	62630	AOEM	
	Inhalation	26	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	8,2921900	0,8542800
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,1382032	0,0142380
% of RVNAS	172,75%	17,80%

Table and wine grapes

Grape

Table A 37: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Grape
Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	10	ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 38: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for MIBZIAN EXTRA 550 SL: outdoor spray applications					
Application rate of active substance	1,05 kg a.s./ha		i_AppRate		
Assumed area treated	10 ha/day		d_AreaTreated		
Amount of active substance applied	10,5 kg a.s./day		i_AmountAS		
Dermal absorption of the product	1,00%		i_AbsorpProduct		
Dermal absorption of in-use dilution	9,00%		i_AbsorInuse		
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.				
Indoor or Outdoor application	Outdoor				
Application method	Upward spraying				
Application equipment	Vehicle-mounted				
Season	not relevant				
Outdoor/Soluble concentrates, emulsifiable concentrate, etc. Upward spraying/Vehicle-mounted					
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	29683	111041	AOEM	
	Body	18628	142613	AOEM	
	Head	545	2988	AOEM	
	Protected hands (gloves)	159	2080	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	191	1536	AOEM	
	Protected head (hood and face shield)	9	169	AOEM	
	Inhalation	7	30	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	20302	65486	AOEM	No data available for a drift reduction scenario
	Body	92523	539870	AOEM	
	Head	12159	74626	AOEM	
	Protected hands (gloves)	369	9654	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	1207	2359	AOEM	
	Inhalation	241	868	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	11,9855447	1,4935906
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,1997591	0,0248932
% of RVNAS	249,70%	31,12%

Table A 39: Input parameters considered for the estimation of operator exposure

Formulation type	SC	Crop type	Grapes
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Application rate (AR)	1.05	kg a.s./ha	Application method	Upward spraying
Area treated per day (A)	1	ha	Application equipment	Manual knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 40: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Operator exposure for IMBZIAN EXTRA 330 SL: outdoor spray applications						
Application rate of active substance		1,05 kg a.s./ha		i_AppRate		
Assumed area treated		1 ha/day		d_AreaTreated		
Amount of active substance applied		1,05 kg a.s./day		i_AmountAS		
Dermal absorption of the product		1,00%		i_AbsorpProduct		
Dermal absorption of in-use dilution		9,00%		i_AbsorInuse		
Formulation type		Soluble concentrates, emulsifiable concentrate, etc.				
Indoor or Outdoor application		Outdoor				
Application method		Upward spraying				
Application equipment		Manual-Knapsack				
Season		late (dense foliage)				
Operator exposure from mixing, loading and application (mg a.s./day) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)						
Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment	
		75 th centile	95 th centile			
	Hands	9495	25482	AOEM		
	Body	803	2787	AOEM		
	Head	5	11	AOEM		
	Protected hands (gloves)	18	164	AOEM		
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM		
	Protected head (hood and face shield)	5	11	AOEM		
	Inhalation	25	26	AOEM		
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor	
	Gloves	Yes		Incl. in AOEM model		
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model		
	Head and respiratory PPE	None		1	1	
	Water soluble bag	No		1		
Application	Exposure values	µg exposure/day applied		Reference	Comment	
		75 th centile	95 th centile			
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario	
	Body	1216961	2189719	AOEM		
	Head	1911	3234	AOEM		
	Protected hands (gloves)	192	426	AOEM		
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM		
	Inhalation	153	344	AOEM		
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor	
	Gloves	Yes		Incl. in AOEM model		
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model		
	Head and respiratory PPE	None		1	1	
	Closed cab	No		vehicle mounted upward spraying only		
	1. Total					
		Without RPE/PPE		With RPE/PPE		
Longer term						
Total systemic exposure from mixing, loading and application (mg a.s./day)		111,6888485		4,4111064		
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)		1,8614808		0,0735184		
% of RVNAS		2326,85%		91,90%		

Table A 41: Estimation of longer term operator exposure towards copper according to EFSA guidance – with head and respiratory PPE

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	1,05 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	1,05 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Upward spraying	
Application equipment	Manual-Knapsack	
Season	late (dense foliage)	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	18987	26941	AOEM	No data available for a drift reduction scenario
	Body	1216961	2189719	AOEM	
	Head	1911	3234	AOEM	
	Protected hands (gloves)	192	426	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	44920	188036	AOEM	
	Inhalation	153	344	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	FP1, P1 and similar		0,8	0,25
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	111,6888485	4,2615836
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	1,8614808	0,0710264
% of RVNAS	2326,85%	88,78%

Berries and small fruits

Currant

Table A 42: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Low berries and small fruits
Application rate (AR)	1.05	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	50	ha	Application equipment	Vehicle-mounted sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 43: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	1,05 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	50 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	52,5 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Downward spraying	
Application equipment	Vehicle-mounted	
Season	not relevant	

	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
Mixing and loading	Hands	102468	388817	AOEM	
	Body	57741	227628	AOEM	
	Head	2724	14939	AOEM	
	Protected hands (gloves)	453	10399	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	796	7678	AOEM	
	Protected head (hood and face shield)	44	846	AOEM	
	Inhalation	12	32	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
Application	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	
	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	7787	41689	AOEM	
	Body	4354	22445	AOEM	
	Head	206	621	AOEM	
	Protected hands (gloves)	364	5290	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	119	293	AOEM	
	Inhalation	8	28	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Potential exposure		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	2,7601002	1,0718930
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,0460017	0,0178649
% of RVNAS	57,50%	22,33%

Table A 44: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Low berries and small fruits
Application rate (AR)	1.05	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	1	ha	Application equipment	Manual Knapsack sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Outdoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	60	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 45: Estimation of longer term operator exposure towards copper according to EFSA guidance

Operator exposure for MIEDZIAN EXTRA 350 S.C. outdoor spray applications

Application rate of active substance	1,05 kg a.s./ha	<i>i_AppRate</i>
Assumed area treated	1 ha/day	<i>d_AreaTreated</i>
Amount of active substance applied	1,05 kg a.s./day	<i>i_AmountAS</i>
Dermal absorption of the product	1,00%	<i>i_AbsorpProduct</i>
Dermal absorption of in-use dilution	9,00%	<i>i_AbsorInuse</i>
Formulation type	Soluble concentrates, emulsifiable concentrate, etc.	
Indoor or Outdoor application	Outdoor	
Application method	Downward spraying	
Application equipment	Manual-Knapsack	
Season	not relevant	

Mixing and loading	Exposure values	µg exposure/day mixed and loaded		Reference	Comment
		75 th centile	95 th centile		
	Hands	9495	25482	AOEM	
	Body	803	2787	AOEM	
	Head	5	11	AOEM	
	Protected hands (gloves)	18	164	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	25	103	AOEM	
	Protected head (hood and face shield)	5	11	AOEM	
	Inhalation	25	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Water soluble bag	No		1	

Application	Exposure values	µg exposure/day applied		Reference	Comment
		75 th centile	95 th centile		
	Hands	1544	4213	AOEM	
	Body	88868	137007	AOEM	
	Head	12	85	AOEM	
	Protected hands (gloves)	5	22	AOEM	
	Protected body (workwear or protective garment and sturdy footwear)	8903	62630	AOEM	
	Inhalation	26	26	AOEM	
	Protective Equipment	Select for inclusion		Penetration factor	Inhalation Protection factor
	Gloves	Yes		Incl. in AOEM model	
	Clothing	Work wear - arms, body and legs covered		Incl. in AOEM model	
	Head and respiratory PPE	None		1	1
	Closed cab	No		vehicle mounted upward spraying only	

1. Total

	Without RPE/PPE	With RPE/PPE
Longer term		
Total systemic exposure from mixing, loading and application (mg a.s./day)	8,2921900	0,8542800
Total systemic exposure from mixing, loading and application per kg body weight (mg/kg bw/day)	0,1382032	0,0142380
% of RVNAS	172,75%	17,80%

Fruiting vegetables (indoor)

Tomato, Aubergines, Melon, Pumpkins, Watermelon

Table A 46: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Fruiting vegetables
Application rate (AR)	1.25	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	1	ha	Application equipment	Hand held sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Indoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	70	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 47: Estimation of longer term operator exposure towards copper according to EFSA guidance

OPERATOR EXPOSURE		DUTCH GREENHOUSE MODEL		
form	S.C.	Application including mixing and loading		
a.s.	Copper			
Parameter	Value	Unit	References, comments	
MANUAL SPRAYING in greenhouses				
AR Application rate	1,25	kg a.s./ha	summary of intended uses	
A Area treated	1	ha/ day	Dutch model	
Inhalation Exposure			without PPE	
SV Surrogate Exposure Value	1	mg a.s./ kg a.s.	For dusting see note* (Dutch model)	
Inhalation Exposure (without PPE)	1,25	mg a.s./ day	IE = SV x AR x A	
Inhalation Exposure (with PPE)			with PPE	
PPE-factor	10		Non-powered mask filtertype 2 (most conservative): 10; more advanced RPE: see note** (Dutch model)	
Inhalation Exposure (with PPE)	0,125	mg a.s./ day	IE(PPE) = (1/PPE factor) x IE	
Dermal Exposure			without PPE	
SV Surrogate Exposure Value	200	mg a.s./ kg a.s.	For dusting see note* (Dutch model)	
Dermal Exposure	250	mg a.s./ day	DE = SV x AR x A	
Dermal Exposure (with PPE)			with PPE	
PPE-factor	10		Gloves + coverall: 10 (Dutch model)	
Dermal Exposure (with PPE)	25	mg a.s./ day	DE(PPE) = (1/PPE-factor) x DE	
Internal exposure				
IA Inhalation Absorption	100	%		
DA Dermal Absorption	9	%		
AOEL	0,08	mg a.s./ day	based on 70 kg bw	
	Without PPE	With PPE		
Internal exposure	[mg a.s. / day]	[mg a.s. / day]		

Inhalation	1,2500	0,1250	IE(int) = IE x (IA/100)
Dermal	22,5000	2,2500	DE(int) = DE x (DA/100)
Total	23,7500	2,3750	sum
% AOEL			
Inhalation	1563	156	%AOEL = 100 x IE(int) / AOEL
Dermal	28125	2813	%AOEL = 100 x DE(int) / AOEL
Total	29688	2969	sum

- * NOTE: The above mentioned model is for spraying in greenhouses. For dusting of carnations the surrogate values should be changed: inhalation should be 20 mg/kg instead of 1, and dermal should be 300 mg/kg instead of 200.
- ** Note: Only for gasforming/gaseous preparations and soil fumigation preparations: powered full-face filtering devices with filtertype 2 (factor 20), powered full-face filtering devices with filtertype 3 (factor 40)

	No PPE	With PPE
Systemic exposure [mg/kg bw/day]	0.3393	0.03393
% AOEL	424.1 %	42.4 %

Fruiting vegetables (indoor)

Cucumber

Table A 48: Input parameters considered for the estimation of operator exposure

Formulation type	SC		Crop type	Fruiting vegetables
Application rate (AR)	0.8	kg a.s./ha	Application method	Downward spraying
Area treated per day (A)	1	ha	Application equipment	Hand held sprayer
Dermal absorption (DA)	1	% (concentr.)	Indoor/outdoor	Indoor
	9	% (dilution)	Closed cabin	No
Inhalation absorption (IA)	100	%	Drift reduction	No
Body weight (BW)	70	kg/person	Cultivation	Normal
AOEL	0.08	mg/kg bw/d	Water soluble bag	No

Table A 49: Estimation of longer term operator exposure towards copper according to EFSA guidance

OPERATOR EXPOSURE		DUTCH GREENHOUSE MODEL		
form	S.C.	Application including mixing and loading		
a.s.	Copper			
Parameter	Value	Unit	References, comments	
MANUAL SPRAYING in greenhouses				
AR	Application rate	0,8	kg a.s./ha	summary of intended uses
A	Area treated	1	ha/ day	Dutch model
Inhalation Exposure			without PPE	
SV	Surrogate Exposure Value	1	mg a.s./ kg a.s.	For dusting see note* (Dutch model)
Inhalation Exposure (without PPE)		0,8	mg a.s./ day	IE = SV x AR x A
Inhalation Exposure (with PPE)			with PPE	

PPE-factor	10		Non-powered mask filtertype 2 (most conservative): 10; more advanced RPE: see note** (Dutch model)
Inhalation Exposure (with PPE)	0,08	mg a.s./ day	IE(PPE) = (1/PPE factor) x IE
Dermal Exposure			without PPE
SV Surrogate Exposure Value	200	mg a.s./ kg a.s.	For dusting see note* (Dutch model)
Dermal Exposure	160	mg a.s./ day	DE = SV x AR x A
Dermal Exposure (with PPE)			with PPE
PPE-factor	10		Gloves + coverall: 10 (Dutch model)
Dermal Exposure (with PPE)	16	mg a.s./ day	DE(PPE) = (1/PPE-factor) x DE
Internal exposure			
IA Inhalation Absorption	100	%	
DA Dermal Absorption	9	%	
AOEL	0,08	mg a.s./ day	based on 70 kg bw
	Without PPE	With PPE	
Internal exposure	[mg a.s. / day]	[mg a.s. / day]	
Inhalation	0,8000	0,0800	IE(int) = IE x (IA/100)
Dermal	14,4000	1,4400	DE(int) = DE x (DA/100)
Total	15,2000	1,5200	sum
% AOEL			
Inhalation	1000	100	%AOEL = 100 x IE(int) / AOEL
Dermal	18000	1800	%AOEL = 100 x DE(int) / AOEL
Total	19000	1900	sum
<p>* NOTE: The above mentioned model is for spraying in greenhouses. For dusting of carnations the surrogate values should be changed: inhalation should be 20 mg/kg instead of 1, and dermal should be 300 mg/kg instead of 200.</p> <p>** Note: Only for gasforming/gaseous preparations and soil fumigation preparations: powered full-face filtering devices with filtertype 2 (factor 20), powered full-face filtering devices with filtertype 3 (factor 40)</p>			
	No PPE	With PPE	
Systemic exposure [mg/kg bw/day]	0.2171	0.0217	
% AOEL	271.4 %	27.1 %	

B. Non-professional user

Pome frutis: Apple, Pear, Quince, Medlar

Stone frutis: Cherry, sweet cherry, apricot, plum

Table A 50: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	1,5 l/ha	Work rate/day	0,01 ha
Application volume	500 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		1,5 litres product/ha
Work rate		0,01 ha/day
Number of operations		1
Hand contamination		0,1 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,1 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	500	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,1 ml/day	16,175 ml/day
Concn. of a.s. product or spray	350 mg/ml	1,05 mg/ml
Dermal exposure to a.s.	35 mg/day	16,98375 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,35 mg/day	1,5285375 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02 ml/h
Duration of exposure	0,5 h
Concentration of a.s. in spray	1,05 mg/ml
Inhalation exposure to a.s.	0,0105 mg/day
Percent absorbed	100 %
Absorbed dose	0,0105 mg/day

PREDICTED EXPOSURE

Total absorbed dose	1,8890375 mg/day
Operator body weight	60 kg
Operator exposure	0,031483958 mg/kg bw/day

% AOEL = 39.4 %

Stone frutis: Cherry, sweet cherry, apricot, plum

Table A 51: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	3 l/ha	Work rate/day	0,01 ha
Application volume	500 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		3 litres product/ha
Work rate		0,01 ha/day
Number of operations		1
Hand contamination		0,1 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,1 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	500	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application	
Dermal exposure	0,1 ml/day		16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml		2,1 mg/ml
Dermal exposure to a.s.	35 mg/day		33,9675 mg/day
Percent absorbed	1 %		9 %
Absorbed dose	0,35 mg/day		3,057075 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02	ml/h
Duration of exposure	0,5	h
Concentration of a.s. in spray	2,1	mg/ml
Inhalation exposure to a.s.	0,021	mg/day
Percent absorbed	100	%
Absorbed dose	0,021	mg/day

PREDICTED EXPOSURE

Total absorbed dose	3,428075	mg/day
Operator body weight	60	kg
Operator exposure	0,057134583	mg/kg bw/day

%AOEL= 71.4 %

Stone frutis: Peach

Table A 52: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	3 l/ha	Work rate/day	0,01 ha
Application volume	700 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		3 litres product/ha
Work rate		0,01 ha/day
Number of operations		2
Hand contamination		0,2 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,2 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	700	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,2 ml/day	16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml	1,5 mg/ml
Dermal exposure to a.s.	70 mg/day	24,2625 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,7 mg/day	2,183625 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02 ml/h
Duration of exposure	0,5 h
Concentration of a.s. in spray	1,5 mg/ml
Inhalation exposure to a.s.	0,015 mg/day
Percent absorbed	100 %
Absorbed dose	0,015 mg/day

PREDICTED EXPOSURE

Total absorbed dose	2,898625 mg/day
Operator body weight	60 kg
Operator exposure	0,048310417 mg/kg bw/day

%AOEL = 60.4 %

Tree nuts: Walnut, Hazelnut

Table A 53: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	3 l/ha	Work rate/day	0,01 ha
Application volume	800 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		3 litres product/ha
Work rate		0,01 ha/day
Number of operations		2
Hand contamination		0,2 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,2 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	800	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application	
Dermal exposure	0,2 ml/day	16,175	ml/day
Concen. of a.s. product or spray	350 mg/ml	1,3125	mg/ml
Dermal exposure to a.s.	70 mg/day	21,2296875	mg/day
Percent absorbed	1 %	9	%
Absorbed dose	0,7 mg/day	1,910671875	mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02	ml/h
Duration of exposure	0,5	h
Concentration of a.s. in spray	1,3125	mg/ml
Inhalation exposure to a.s.	0,013125	mg/day
Percent absorbed	100	%
Absorbed dose	0,013125	mg/day

PREDICTED EXPOSURE

Total absorbed dose	2,623796875	mg/day
Operator body weight	60	kg
Operator exposure	0,043729948	mg/kg bw/day

%AOEL = 54.7 %

Fruiting vegetables (outdoor): Tomato, Aubergines, Cucumber, Gherkins, Courgette

Table A 54: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	2,5 l/ha	Work rate/day	0,01 ha
Application volume	700 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		2,5 litres product/ha
Work rate		0,01 ha/day
Number of operations		2
Hand contamination		0,2 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,2 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	700	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,2 ml/day	16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml	1,25 mg/ml
Dermal exposure to a.s.	70 mg/day	20,21875 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,7 mg/day	1,8196875 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02 ml/h
Duration of exposure	0,5 h
Concentration of a.s. in spray	1,25 mg/ml
Inhalation exposure to a.s.	0,0125 mg/day
Percent absorbed	100 %
Absorbed dose	0,0125 mg/day

PREDICTED EXPOSURE

Total absorbed dose	2,5321875 mg/day
Operator body weight	60 kg
Operator exposure	0,042203125 mg/kg bw/day

%AOEL = 52.8 %

Legume vegetables: French bean, Peas with pods, Bean with pods

Table A 55: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	2,5 l/ha	Work rate/day	0,01 ha
Application volume	700 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		2,5 litres product/ha
Work rate		0,01 ha/day
Number of operations		2
Hand contamination		0,2 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,2 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	700	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,2 ml/day	16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml	1,25 mg/ml
Dermal exposure to a.s.	70 mg/day	20,21875 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,7 mg/day	1,8196875 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02	ml/h
Duration of exposure	0,5	h
Concentration of a.s. in spray	1,25	mg/ml
Inhalation exposure to a.s.	0,0125	mg/day
Percent absorbed	100	%
Absorbed dose	0,0125	mg/day

PREDICTED EXPOSURE

Total absorbed dose	2,5321875	mg/day
Operator body weight	60	kg
Operator exposure	0,042203125	mg/kg bw/day

%AOEL = 52.8 %

Table and wine grapes: Grape

Table A 56: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	3 l/ha	Work rate/day	0,01 ha
Application volume	500 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		3 litres product/ha
Work rate		0,01 ha/day
Number of operations		1
Hand contamination		0,1 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,1 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	500	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,1 ml/day	16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml	2,1 mg/ml
Dermal exposure to a.s.	35 mg/day	33,9675 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,35 mg/day	3,057075 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02 ml/h
Duration of exposure	0,5 h
Concentration of a.s. in spray	2,1 mg/ml
Inhalation exposure to a.s.	0,021 mg/day
Percent absorbed	100 %
Absorbed dose	0,021 mg/day

PREDICTED EXPOSURE

Total absorbed dose	3,428075 mg/day
Operator body weight	60 kg
Operator exposure	0,057134583 mg/kg bw/day

%AOEL= 71.4 %

Berries and small fruits: Currant

Table A 57: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

THE UK PREDICTIVE OPERATOR EXPOSURE MODEL (POEM)

Application method	Home garden sprayer (5 litre tank). Outdoor, low level target		
Product	MIEDZIAN EXTRA 350 S.C.	Active substance	copper
Formulation type	water-based	a.s. concentration	350 mg/ml
Dermal absorption from product	1 %	Dermal absorption from spray	9 %
Container	Home garden, separate measure		
PPE during mix/loading	None	PPE during application	None
Dose	3 l/ha	Work rate/day	0,01 ha
Application volume	700 l/ha	Duration of spraying	0,5 h

EXPOSURE DURING MIXING AND LOADING

Container size	Home garden pack	litres
Hand contamination/operation		0,1 ml
Application dose		3 litres product/ha
Work rate		0,01 ha/day
Number of operations		2
Hand contamination		0,2 ml/day
Protective clothing		None
Transmission to skin		100 %
Dermal exposure to formulation		0,2 ml/day

DERMAL EXPOSURE DURING SPRAY APPLICATION

Application technique	Home garden sprayer (5 litre tank). Outdoor, low level target		
Application volume	700	spray/ha	
Volume of surface contamination	50	ml/h	
Distribution	Hands	Trunk	Legs
	25%	25%	50%
Clothing	None	T-shirt 10% exp	Shorts 70% exposed
Penetration	100%	20%	18%
Dermal exposure	10	3,5	18,85 ml/h
Duration of exposure	0,5	h	
Total dermal exposure to spray	16,175	ml/day	

ABSORBED DERMAL DOSE

	Mix/load	Application
Dermal exposure	0,2 ml/day	16,175 ml/day
Concen. of a.s. product or spray	350 mg/ml	1,5 mg/ml
Dermal exposure to a.s.	70 mg/day	24,2625 mg/day
Percent absorbed	1 %	9 %
Absorbed dose	0,7 mg/day	2,183625 mg/day

INHALATION EXPOSURE DURING SPRAYING

Inhalation exposure	0,02 ml/h
Duration of exposure	0,5 h
Concentration of a.s. in spray	1,5 mg/ml
Inhalation exposure to a.s.	0,015 mg/day
Percent absorbed	100 %
Absorbed dose	0,015 mg/day

PREDICTED EXPOSURE

Total absorbed dose	2,898625 mg/day
Operator body weight	60 kg
Operator exposure	0,048310417 mg/kg bw/day

%AOEL= 60.4 %

Fruiting vegetables (indoor): Tomato, Aubergines, Melon, Pumpkins, Watermelon

Table A 58: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to Dutch Greenhouse model

OPERATOR EXPOSURE		DUTCH GREENHOUSE MODEL		
form	S.C.	Application including mixing and loading		
a.s.	Copper			
Parameter	Value	Unit	References, comments	
MANUAL SPRAYING in greenhouses				
AR Application rate	1,25	kg a.s./ha	summary of intended uses	
A Area treated	0,05	ha/ day	Dutch model	
Inhalation Exposure			without PPE	
SV Surrogate Exposure Value	1	mg a.s./ kg a.s.	For dusting see note* (Dutch model)	
Inhalation Exposure (without PPE)		0,0625	mg a.s./ day	IE = SV x AR x A
Inhalation Exposure (with PPE)			with PPE	
PPE-factor	10		Non-powered mask filtertype 2 (most conservative): 10; more advanced RPE: see note** (Dutch model)	
Inhalation Exposure (with PPE)		0,00625	mg a.s./ day	IE(PPE) = (1/PPE factor) x IE
Dermal Exposure			without PPE	
SV Surrogate Exposure Value	200	mg a.s./ kg a.s.	For dusting see note* (Dutch model)	
Dermal Exposure		12,5	mg a.s./ day	DE = SV x AR x A
Dermal Exposure (with PPE)			with PPE	
PPE-factor	10		Gloves + coverall: 10 (Dutch model)	
Dermal Exposure (with PPE)		1,25	mg a.s./ day	DE(PPE) = (1/PPE-factor) x DE
Internal exposure				
IA Inhalation Absorption	100	%		
DA Dermal Absorption	9	%		
AOEL	0,08	mg a.s./ day	based on 70 kg bw	
	Without PPE	With PPE		
Internal exposure	[mg a.s. / day]	[mg a.s. / day]		
Inhalation	0,0625	0,0063	IE(int) = IE x (IA/100)	
Dermal	1,1250	0,1125	DE(int) = DE x (DA/100)	
Total	1,1875	0,1188	sum	
% AOEL				
Inhalation	78	8	%AOEL = 100 x IE(int) / AOEL	
Dermal	1406	141	%AOEL = 100 x DE(int) / AOEL	
Total	1484	148	sum	

* NOTE: The above mentioned model is for spraying in greenhouses. For dusting of carnations the surrogate values should be changed: inhalation should be 20 mg/kg instead of 1, and dermal should be 300 mg/kg instead of 200.

** Note: Only for gasforming/gaseous preparations and soil fumigation preparations: powered full-face filtering devices with filtertype 2 (factor 20), powered full-face filtering devices with filtertype 3 (factor 40)

	No PPE
Systemic exposure [mg/kg bw/day]	0.01696
% AOEL	21.2 %

Fruiting vegetables (indoor): Cucumber

Table A 59: Input parameters considered for the estimation of operator exposure and Estimation of longer term operator exposure towards copper according to UK POEM

OPERATOR EXPOSURE		DUTCH GREENHOUSE MODEL		
form	S.C.	Application including mixing and loading		
a.s.	Copper			
Parameter	Value	Unit	References, comments	
MANUAL SPRAYING in greenhouses				
AR	Application rate	0,8	kg a.s./ha	summary of intended uses
A	Area treated	0,05	ha/ day	Dutch model
Inhalation Exposure			without PPE	
SV	Surrogate Exposure Value	1	mg a.s./ kg a.s.	For dusting see note* (Dutch model)
Inhalation Exposure (without PPE)		0,04	mg a.s./ day	IE = SV x AR x A
Inhalation Exposure (with PPE)			with PPE	
PPE-factor		10	Non-powered mask filtertype 2 (most conservative): 10; more advanced RPE: see note** (Dutch model)	
Inhalation Exposure (with PPE)		0,004	mg a.s./ day	IE(PPE) = (1/PPE factor) x IE
Dermal Exposure			without PPE	
SV	Surrogate Exposure Value	200	mg a.s./ kg a.s.	For dusting see note* (Dutch model)
Dermal Exposure		8	mg a.s./ day	DE = SV x AR x A
Dermal Exposure (with PPE)			with PPE	
PPE-factor		10	Gloves + coverall: 10 (Dutch model)	
Dermal Exposure (with PPE)		0,8	mg a.s./ day	DE(PPE) = (1/PPE-factor) x DE
Internal exposure				
IA	Inhalation Absorption	100	%	based on 70 kg bw
DA	Dermal Absorption	9	%	
	AOEL	0,08	mg a.s./ day	
		Without PPE	With PPE	
	Internal exposure	[mg a.s. / day]	[mg a.s. / day]	
	Inhalation	0,0400	0,0040	IE(int) = IE x (IA/100)
	Dermal	0,7200	0,0720	DE(int) = DE x (DA/100)
	Total	0,7600	0,0760	sum
	% AOEL			
	Inhalation	50	5	%AOEL = 100 x IE(int) / AOEL
	Dermal	900	90	%AOEL = 100 x DE(int) /

	Total	950	95	AOEL sum
*	NOTE: The above mentioned model is for spraying in greenhouses. For dusting of carnations the surrogate values should be changed: inhalation should be 20 mg/kg instead of 1, and dermal should be 300 mg/kg instead of 200.			
**	Note: Only for gasforming/gaseous preparations and soil fumigation preparations: powered full-face filtering devices with filtertype 2 (factor 20), powered full-face filtering devices with filtertype 3 (factor 40)			
				No PPE
	Systemic exposure [mg/kg bw/day]			0.01086
	% AOEL			13.6 %

A 3.2 Worker exposure calculations (KCP 7.2.3.1)

A 3.2.1 Calculations for copper

Pome frutis: Apple, pear, Quince, Medlar
Stone fruits: Cherry, sweet cherry, apricot, plum

Table A 60: Input parameters considered for the estimation of worker exposure

Intended use(s)	Searching, Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm ² /kg a.s./ha
Application rate (AR)	0.525 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	2	Inhalation absorption (IA)	100	%
Interval between applications	7 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	2250	cm ² /h
Multiple application factor (MAF)	1.9	TC dermal (work wear)	4500	cm ² /h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	2250	cm ² /h
AOEL	0.08 mg/kg bw/d			

Table A 61: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE		EUROPOEM II MODEL	
form	S.C.	Re-entry in the field	
a.s.	copper		
Parameter	Value	Unit	References, comments
Re-entry activities in the field			
AR Application rate	0,9975	kg a.s./ha	summary of intended uses
Worker			
Duration			
T	6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure			without PPE
no model available	-		
Dermal Exposure			
DFR Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)

TC	Transfer coefficient	0,45	m2/ hour	vegetable (field): 0.25; ornamentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
	Dermal Exposure	80,7975	mg a.s./ day	DE = DFR x AR x TC x T
Internal exposure				
DA	Dermal Absorption	9	%	
	PPE-factor dermal	5		gloves*
	AOEL	0,08	mg a.s./ day	based on 70 kg bw
		Without PPE	With PPE	
		[mg a.s./ day]	[mg a.s./ day]	
Internal exposure				
	Inhalation	-	-	no model available
	Dermal	7,272	1,454	DE(int) = DE x (DA/100)
	Total	7,272	1,454	sum
% AOEL				
	Inhalation	-	-	no model available
	Dermal	9090	1818	%AOEL = 100 x DE(int) / AOEL
	Total	9090	1818	sum

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1039	0.0208
% AOEL	129.9 %	26 %

Stone fruits: Cherry, sweet cherry, apricot, plum, peach

Table A 62: Input parameters considered for the estimation of worker exposure

Intended use(s)	Searching, Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm²/kg a.s./ha
Application rate (AR)	1.05 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	1	Inhalation absorption (IA)	100	%
Interval between applications	365 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	2250	cm²/h
Multiple application factor (MAF)	-	TC dermal (work wear)	4500	cm²/h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	2250	cm²/h
AOEL	0.08 mg/kg bw/d			

Table A 63: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE		EUROPOEM II MODEL	
form	S.C.	Re-entry in the field	
a.s.	copper		
Parameter	Value	Unit	References, comments
Re-entry activities in the field			
AR Application rate	1,05	kg a.s./ha	summary of intended uses

Worker			
Duration			
T	6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure			
no model available		-	without PPE
Dermal Exposure			
DFR	Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha default (Europoem II)
TC	Transfer coefficient	0,45	m2/ hour vegetable (field): 0.25; orna-mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
Dermal Exposure		85,05	mg a.s./ day DE = DFR x AR x TC x T
Internal exposure			
DA	Dermal Absorption	9	%
	PPE-factor dermal	5	gloves*
	AOEL	0,08	mg a.s./ day based on 70 kg bw
		Without PPE	With PPE
Internal exposure		[mg a.s./ day]	[mg a.s./ day]
	Inhalation	-	-
	Dermal	7,655	1,531
	Total	7,655	1,531
			sum
			no model available
			DE(int) = DE x (DA/100)
% AOEL			
	Inhalation	-	-
	Dermal	9568	1914
	Total	9568	1914
			sum
			no model available
			%AOEL = 100 x DE(int) / AOEL

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.110	0.0219
% AOEL	136.7 %	27.3 %

Tree nuts: Walnut, Hazelnut

Table A 64: Input parameters considered for the estimation of worker exposure

Intended use(s)	Searching, Reaching, picking		Dislodgeable foliar residue (DFR)	3	µg/cm²/kg a.s./ha
Application rate (AR)	1.05	kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	2		Inhalation absorption (IA)	100	%
Interval between applications	10	days	Work rate per day (WR)	6	h/d
Half-life of active substance	30	days	TC dermal (potential)	2250	cm²/h
Multiple application factor (MAF)	1.8		TC dermal (work wear)	4500	cm²/h

Body weight (BW)	70	kg/person	TC dermal (work wear, gloves)	2250	cm ² /h
AOEL	0.08	mg/kg bw/d			

Table A 65: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE			EUROPOEM II MODEL	
form	S.C.		Re-entry in the field	
a.s.	copper			
Parameter	Value	Unit	References, comments	
Re-entry activities in the field				
AR	Application rate	1,89	kg a.s./ha	summary of intended uses
Worker				
Duration				
T		6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure				
no model available		-	without PPE	
Dermal Exposure				
DFR	Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)
TC	Transfer coefficient	0,45	m2/ hour	vegetable (field): 0.25; orna- mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
Dermal Exposure		153,09	mg a.s./ day	DE = DFR x AR x TC x T
Internal exposure				
DA	Dermal Absorption	9	%	
PPE-factor dermal		5		gloves*
AOEL		0,08	mg a.s./ day	based on 70 kg bw
		Without PPE	With PPE	
Internal exposure		[mg a.s./ day]	[mg a.s./ day]	
Inhalation		-	-	no model available
Dermal		13,778	2,756	DE(int) = DE x (DA/100)
Total		13,778	2,756	sum
% AOEL				
Inhalation		-	-	no model available
Dermal		17223	3445	%AOEL = 100 x DE(int) / AOEL
Total		17223	3445	sum

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1968	0.0394
% AOEL	246 %	49.2 %

Fruiting vegetables (outdoor): Tomato, Aubergines, Cucumber, Gherkins, Courgette

Table A 66: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm²/kg a.s./ha
Application rate (AR)	0.875 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	3	Inhalation absorption (IA)	100	%
Interval between applications	7 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	5800	cm²/h
Multiple application factor (MAF)	2.6	TC dermal (work wear)	2500	cm²/h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	580	cm²/h
AOEL	0.08 mg/kg bw/d			

Table A 67: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE			EUROPOEM II MODEL	
form	S.C.		Re-entry in the field	
a.s.	copper			
Parameter	Value	Unit	References, comments	
Re-entry activities in the field				
AR	Application rate	2,275	kg a.s./ha	summary of intended uses
Worker				
Duration				
T		6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure				
no model available		-	without PPE	
Dermal Exposure				
DFR	Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)
TC	Transfer coefficient	0,25	m2/ hour	vegetable (field): 0.25; orna- mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
Dermal Exposure		102,375	mg a.s./ day	DE = DFR x AR x TC x T
Internal exposure				
DA	Dermal Absorption	9	%	
PPE-factor dermal		5		gloves*
AOEL		0,08	mg a.s./ day	based on 70 kg bw
		Without PPE	With PPE	
Internal exposure		[mg a.s./ day]	[mg a.s./ day]	
Inhalation		-	-	no model available
Dermal		9,214	1,843	DE(int) = DE x (DA/100)
Total		9,214	1,843	sum
% AOEL				
Inhalation		-	-	no model available
Dermal		11517	2303	%AOEL = 100 x DE(int) / AOEL

Total	11517	2303	sum
* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.			
		No gloves	With gloves
Systemic exposure [mg/kg bw/day]		0.1316	0.0263
% AOEL		164.5 %	32.9 %

Legume vegetables: French bean, Peas with pods, Bean with pods

Table A 68: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm ² /kg a.s./ha
Application rate (AR)	0.875 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	3	Inhalation absorption (IA)	100	%
Interval between applications	7 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	5800	cm ² /h
Multiple application factor (MAF)	2.6	TC dermal (work wear)	2500	cm ² /h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	580	cm ² /h
AOEL	0.08 mg/kg bw/d			

Table A 69: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE		EUROPOEM II MODEL		
form	S.C.	Re-entry in the field		
a.s.	copper			
Parameter	Value	Unit	References, comments	
Re-entry activities in the field				
AR Application rate	2,275	kg a.s./ha	summary of intended uses	
Worker				
Duration				
T	6	hours / day	default: 6 h (Europoem II)	
Inhalation Exposure			without PPE	
no model available	-			
Dermal Exposure				
DFR Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)	
TC Transfer coefficient	0,25	m2/ hour	vegetable (field): 0.25; orna- mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)	
Dermal Exposure	102,375	mg a.s./ day	DE = DFR x AR x TC x T	
Internal exposure				
DA Dermal Absorption	9	%		
PPE-factor dermal	5		gloves*	
AOEL	0,08	mg a.s./ day	based on 70 kg bw	

	Without PPE [mg a.s./ day]	With PPE [mg a.s./ day]	
Internal exposure			
Inhalation	-	-	no model available
Dermal	9,214	1,843	DE(int) = DE x (DA/100)
Total	9,214	1,843	sum
% AOEL			
Inhalation	-	-	no model available
Dermal	11517	2303	%AOEL = 100 x DE(int) / AOEL
Total	11517	2303	sum

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1316	0.0263
% AOEL	164.5 %	32.9 %

Table and wine grapes: Grape

Table A 70: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking		Dislodgeable foliar residue (DFR)	3	µg/cm ² /kg a.s./ha
Application rate (AR)	1.05	kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	3		Inhalation absorption (IA)	100	%
Interval between applications	10	days	Work rate per day (WR)	2	h/d
Half-life of active substance	30	days	TC dermal (potential)	300000	cm ² /h
Multiple application factor (MAF)	2.4		TC dermal (work wear)	10100	cm ² /h
Body weight (BW)	60	kg/person	TC dermal (work wear, gloves)	-	cm ² /h
AOEL	0.08	mg/kg bw/d			

Table A 71: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE		EUROPOEM II MODEL		
form	S.C.	Re-entry in the field		
a.s.	copper			
Parameter	Value	Unit	References, comments	
Re-entry activities in the field				
AR	Application rate	2,52	kg a.s./ha	summary of intended uses
Worker				
Duration				
T	3	hours / day	default: 6 h (Europoem II)	
Inhalation Exposure				
no model available		-	without PPE	
Dermal Exposure				
DFR	Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)

TC	Transfer coefficient	1,01	m2/ hour	vegetable (field): 0.25; ornamentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
	Dermal Exposure	229,068	mg a.s./ day	DE = DFR x AR x TC x T
Internal exposure				
DA	Dermal Absorption	9	%	
	PPE-factor dermal	5		gloves*
	AOEL	0,08	mg a.s./ day	based on 70 kg bw
		Without PPE	With PPE	
		[mg a.s./ day]	[mg a.s./ day]	
Internal exposure				
	Inhalation	-	-	no model available
	Dermal	20,616	4,123	DE(int) = DE x (DA/100)
	Total	20,616	4,123	sum
		% AOEL		
	Inhalation	-	-	no model available
	Dermal	25770	5154	%AOEL = 100 x DE(int) / AOEL
	Total	25770	5154	sum

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.2945	0.0589
% AOEL	368.1 %	73.6 %

Berries and small fruits: Currant

Table A 72: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm²/kg a.s./ha
Application rate (AR)	1.05 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	2	Inhalation absorption (IA)	100	%
Interval between applications	10 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	3000	cm²/h
Multiple application factor (MAF)	1.8	TC dermal (work wear)	3000	cm²/h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	750	cm²/h
AOEL	0.08 mg/kg bw/d			

Table A 73: Estimation of acute worker exposure towards active substance according to EUROPOEM II

WORKER EXPOSURE		EUROPOEM II MODEL	
form	S.C.	Re-entry in the field	
a.s.	copper		
Parameter	Value	Unit	References, comments
Re-entry activities in the field			
AR Application rate	1,89	kg a.s./ha	summary of intended uses
Worker			

Duration			
T	6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure			without PPE
no model available	-		
Dermal Exposure			
DFR Dislodgeable foliar residue	30	mg a.s./m ² /kg a.s./ha	default (Europoem II)
TC Transfer coefficient	0,3	m ² / hour	vegetable (field): 0.25; orna- mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
Dermal Exposure	102,06	mg a.s./ day	DE = DFR x AR x TC x T
Internal exposure			
DA Dermal Absorption	9	%	
PPE-factor dermal	5		gloves*
AOEL	0,08	mg a.s./ day	based on 70 kg bw
	Without PPE	With PPE	
Internal exposure	[mg a.s./ day]	[mg a.s./ day]	
Inhalation	-	-	no model available
Dermal	9,185	1,837	DE(int) = DE x (DA/100)
Total	9,185	1,837	sum
% AOEL			
Inhalation	-	-	no model available
Dermal	11482	2296	%AOEL = 100 x DE(int) / AOEL
Total	11482	2296	sum

* It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1312	0.0262
% AOEL	164 %	32.8 %

Fruiting vegetables (indoor)

Tomato, Aubergines, Melon, Pumpkins, Watermelon

Table A 74: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking	Dislodgeable foliar residue (DFR)	3	µg/cm ² /kg a.s./ha
Application rate (AR)	0.875 kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	3	Inhalation absorption (IA)	100	%
Interval between applications	7 days	Work rate per day (WR)	6	h/d
Half-life of active substance	30 days	TC dermal (potential)	5800	cm ² /h
Multiple application factor (MAF)	2.6	TC dermal (work wear)	250	cm ² /h
Body weight (BW)	70 kg/person	TC dermal (work wear, gloves)	580	cm ² /h
AOEL	0.08 mg/kg bw/d			

Table A 75: Estimation of acute worker exposure towards active substance according to EUROPOEM II – greenhouse

WORKER EXPOSURE		EUROPOEM II & DUTCH MODEL		
form	S.C.	Re-entry in greenhouses		
a.s.	copper			
Parameter	Value	Unit	References, comments	
Re-entry activities in greenhouses				
AR Application rate	2,275	kg a.s./ha	summary of intended uses	
Worker				
Duration				
Tc Cutting	3	hours / day	default: 3 h (Dutch model)	
Tsb Sorting/ bundling	3	hours / day	default: 3 h (Dutch model)	
Tt Total duration	6	hours / day	default: 6 h (Europoem II)	
Inhalation Exposure			without PPE	
Task Specific Factor				
Surrogate value (indicative)				
TF Cutting	0,1	(mg a.s./h)/ (kg/ha)	Dutch model	
TF Sorting/ bundling	0,01	(mg a.s./h)/ (kg/ha)	Dutch model	
Inhalation Exposure				
Cutting	0,6825	mg a.s./ day	IE = AR x Tc x TF	
Sorting/ bundling	0,06825	mg a.s./ day	IE = AR x Tsb x TF	
Total	0,75075	mg a.s./ day	sum	
Dermal Exposure				
DFR Dislodgeable foliar residue	30	mg a.s./m2/kg a.s./ha	default (Europoem II)	
TC Transfer coefficient	0,25	m2/ hour	vegetable (field): 0.25; ornamentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)	
Dermal Exposure	102,375	mg a.s./ day	DE = DFR x AR x TC x Tt	
Internal exposure				
IA Inhalation Absorption	100	%		
DA Dermal Absorption	9	%		
PPE-factor inhalation	10		reduction factor*	
PPE-factor dermal	5		gloves**	
AOEL	0,08	mg a.s./ day	based on 70 kg bw	
		Without PPE	With PPE	
Internal exposure		[mg a.s./ day]	[mg a.s./ day]	
Inhalation	0,751	0,075	IE(int) = IE x (IA/100)	
Dermal	9,214	1,843	DE(int) = DE x (DA/100)	
Total	9,965	1,918	sum	
% AOEL				
Inhalation	938	94	%AOEL = 100 x IE(int) / AOEL	
Dermal	11517	2303	%AOEL = 100 x DE(int) / AOEL	
Total	12456	2397	sum	

- * Breathing apparatus for workers can only be used in closed areas for a relatively short period of time.
- ** It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1423	0.0274
% AOEL	177.9 %	34.3 %

Fruiting vegetables (indoor): Cucumber

Table A 76: Input parameters considered for the estimation of worker exposure

Intended use(s)	Reaching, picking		Dislodgeable foliar residue (DFR)	3	µg/cm ² /kg a.s./ha
Application rate (AR)	0.8	kg a.s./ha	Dermal absorption (DA)	9	% (worst case)
Number of applications (NA)	4		Inhalation absorption (IA)	100	%
Interval between applications	7	days	Work rate per day (WR)	6	h/d
Half-life of active substance	30	days	TC dermal (potential)	5800	cm ² /h
Multiple application factor (MAF)	3.2		TC dermal (work wear)	250	cm ² /h
Body weight (BW)	70	kg/person	TC dermal (work wear, gloves)	580	cm ² /h
AOEL	0.08	mg/kg bw/d			

Table A 77: Estimation of acute worker exposure towards active substance according to EUROPOEM II – greenhouse

WORKER EXPOSURE		EUROPOEM II & DUTCH MODEL		
form	S.C.		Re-entry in greenhouses	
a.s.	copper			
Parameter		Value	Unit	References, comments
Re-entry activities in greenhouses				
AR	Application rate	2,56	kg a.s./ha	summary of intended uses
Worker				
Duration				
Tc	Cutting	3	hours / day	default: 3 h (Dutch model)
Tsb	Sorting/ bundling	3	hours / day	default: 3 h (Dutch model)
Tt	Total duration	6	hours / day	default: 6 h (Europoem II)
Inhalation Exposure				without PPE
Task Specific Factor				
Surrogate value (indicative)				
TF	Cutting	0,1	(mg a.s./h)/ (kg/ha)	Dutch model
TF	Sorting/ bundling	0,01	(mg a.s./h)/ (kg/ha)	Dutch model
Inhalation Exposure				
	Cutting	0,768	mg a.s./ day	IE = AR x Tc x TF
	Sorting/ bundling	0,0768	mg a.s./ day	IE = AR x Tsb x TF
	Total	0,8448	mg a.s./ day	sum
Dermal Exposure				

DFR	Dislodgeable foliar residue	30	mg a.s./m ² /kg a.s./ha	default (Europoem II)
TC	Transfer coefficient	0,25	m ² / hour	vegetable (field): 0.25; orna- mentals: 0.5; small fruit: 0.3; large fruit: 0.45 (Europoem II)
Dermal Exposure		115,2	mg a.s./ day	DE = DFR x AR x TC x Tt
Internal exposure				
IA	Inhalation Absorption	100	%	
DA	Dermal Absorption	9	%	
	PPE-factor inhalation	10		reduction factor*
	PPE-factor dermal	5		gloves**
	AOEL	0,08	mg a.s./ day	based on 70 kg bw
		Without PPE	With PPE	
		[mg a.s./ day]	[mg a.s./ day]	
Internal exposure				
	Inhalation	0,845	0,084	IE(int) = IE x (IA/100)
	Dermal	10,368	2,074	DE(int) = DE x (DA/100)
	Total	11,213	2,158	sum
% AOEL				
	Inhalation	1056	106	%AOEL = 100 x IE(int) / AOEL
	Dermal	12960	2592	%AOEL = 100 x DE(int) / AOEL
	Total	14016	2698	sum
* Breathing apparatus for workers can only be used in closed areas for a relatively short period of time.				
** It is assumed in the used TC values, that body exposure is already reduced by (protective) clothing. The use of gloves will result in an extra reduction factor of 5.				

	No gloves	With gloves
Systemic exposure [mg/kg bw/day]	0.1602	0.0308
% AOEL	200.2 %	38.5 %

A 3.3 Resident and bystander exposure calculations (KCP 7.2.2.1)

A 3.3.1 Calculations for copper

Pome frutis Apple, Pear, Quince, Medlar (early stage) Tractor mounted boom spray application outdoors to high crops

Table A 78: Input parameters considered for the estimation of longer term bystander exposure

Intended use(s):	Pome fruits		Drift (D):	29,20	% (HCTM, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I*_A):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)

Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 79: Estimation of longer term bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Pome fruits (via spray drift)					
$SDE_B = (AR \times D \times BSA \times DA) / BW$			$SDE_B = (AR \times D \times BSA \times DA) / BW$		
$(99,75 \times 29,2\% \times 1 \times 9\%) / 60$			$(99,75 \times 29,2\% \times 0,21 \times 9\%) / 16,15$		
External exposure	29,127	mg/person	External exposure	6,11667	mg/person
External exposure	0,48545	mg/kg bw/d	External exposure	0,3787412	mg/kg bw/d
Absorbed dose:	0,0436905	mg/kg bw/d	Absorbed dose:	0,0340867	mg/kg bw/d
Bystander: Inhalation exposure after application in Pome fruits					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
$(0,018 / 360 \times 0,9975 \times 8 \times 5 \times 100\%) / 60$			$(0,010 / 360 \times 0,9975 \times 8 \times 5 \times 100\%) / 16,15$		
External exposure	0,001995	mg/person	External exposure	0,0011466	mg/person
External exposure	3,325E-05	mg/kg bw/d	External exposure	7,099E-05	mg/kg bw/d
Absorbed dose:	0,0000333	mg/kg bw/d	Absorbed dose:	0,0000710	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		
Total systemic exposure (absorbed dose)	2,623425	mg/person	Total systemic exposure (absorbed dose)	0,5516469	mg/person
Total systemic exposure (absorbed dose)	0,0437238	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0341577	mg/kg bw/d
% of AOEL:	54,65	%	% of AOEL:	42,70	%

Table A 80: Input parameters considered for the estimation of acute resident exposure

Intended use(s):	Pome fruits		Drift (D):	29,20	% (HCTM, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%

AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 81: Estimation of acute resident exposure towards copper according to EF-SA guidance

Adults			Children		
Residents: Dermal exposure after application in Pome fruits (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,009975 x 1 x 29,2% x 5% x 7300 x 2 x 9%) / 60			(0,009975 x 1 x 29,2% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	2,126271	mg/person	External exposure	0,757302	mg/person
External exposure	0,0354379	mg/kg bw/d	External exposure	0,0468918	mg/kg bw/d
Absorbed dose:	0,0031894	mg/kg bw/d	Absorbed dose:	0,0042203	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,009975 x 1 x 29,2% x 5% x 50% x 20 x 2 x 50%) / 16,15		
			External exposure	0,058254	mg/person
			External exposure	0,0036071	mg/kg bw/d
			Absorbed dose	0,0018035	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			SOE _O = (AR x NA x D x DFR x IgR x OA) / BW		
			(0,009975 x 1 x 29,2% x 20% x 25 x 50%) / 16,15		
			External exposure	0,0145635	mg/person
			External exposure	0,0009018	mg/kg bw/d
			Absorbed dose	0,0004509	mg/kg bw/d
Total systemic exposure: SE _R = SDE _R + SIE _R			Total systemic exposure: SE _R = SDE _R + SIE _R + SOE _H + SOE _O		
Total systemic exposure (absorbed dose)	0,2079344	mg/person	Total systemic exposure (absorbed dose)	0,1128759	mg/person
Total systemic exposure (absorbed dose)	0,0034656	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0069892	mg/kg bw/d
% of AOEL:	4,33	%	% of AOEL:	8,74	%

Manual Knapsack application to high crops

Table A 82: Input parameters considered for the estimation of acute bystander exposure

Intended use(s):	Pome fruits		Drift (D):	29,20	% (HCHH, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 83: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Pome fruits (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(99,75 x 29,2% x 1 x 9%) / 60			(99,75 x 29,2% x 0,21 x 9%) / 16,15		
External exposure	29,127	mg/person	External exposure	6,11667	mg/person
External exposure	0,48545	mg/kg bw/d	External exposure	0,3787412	mg/kg bw/d
Absorbed dose:	0,0436905	mg/kg bw/d	Absorbed dose:	0,0340867	mg/kg bw/d
Bystander: Inhalation exposure after application in Pome fruits					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 0,9975 x 1 x 5 x 100%) / 60			(0,172 / 360 x 0,9975 x 1 x 5 x 100%) / 16,15		
External exposure	0,0041563	mg/person	External exposure	0,0023886	mg/person
External exposure	6,927E-05	mg/kg bw/d	External exposure	0,0001479	mg/kg bw/d
Absorbed dose:	0,0000693	mg/kg bw/d	Absorbed dose:	0,0001479	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	2,6255863	mg/person	Total systemic exposure (absorbed dose)	0,5528889	mg/person
Total systemic exposure (absorbed dose)	0,0437598	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0342346	mg/kg bw/d
% of AOEL:	54,70	%	% of AOEL:	42,79	%

Table A 84: Input parameters considered for the estimation of resident exposure

Intended use(s):	Pome fruits	Drift (D):	29,20	% (HCHH, 3 m)
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Application rate (AR):	0,9975	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 85: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Pome fruits (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,009975 \times 1 \times 29,2\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,009975 \times 1 \times 29,2\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	2,126271	mg/person	External exposure	0,757302	mg/person
External exposure	0,0354379	mg/kg bw/d	External exposure	0,0468918	mg/kg bw/d
Absorbed dose:	0,0031894	mg/kg bw/d	Absorbed dose:	0,0042203	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,009975 \times 1 \times 29,2\% \times 5\% \times 50\% \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,058254	mg/person
			External exposure	0,0036071	mg/kg bw/d
			Absorbed dose	0,0018035	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
$(0,009975 \times 1 \times 29,2\% \times 20\% \times 25 \times 50\%) / 16,15$					

			External exposure	0,0145635	mg/person
			External exposure	0,0009018	mg/kg bw/d
			Absorbed dose	0,0004509	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,2079344	mg/person	Total systemic exposure (absorbed dose)	0,1128759	mg/person
Total systemic exposure (absorbed dose)	0,0034656	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0069892	mg/kg bw/d
% of AOEL:	4,33	%	% of AOEL:	8,74	%

Pome frutis Apple, Pear, Quince, Medlar
Stone fruits Cherry, Sweet cherry, Apricot, Plum (late stage)
Tractor mounted boom spray application outdoors to high crops

Table A 86: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Pome fruits, Stone fruits		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 87: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Pome fruits, Stone fruits (via spray drift)					
$SDE_B = (AR \times D \times BSA \times DA) / BW$			$SDE_B = (AR \times D \times BSA \times DA) / BW$		
$(99,75 \times 15,73\% \times 1 \times 9\%) / 60$			$(99,75 \times 15,73\% \times 0,21 \times 9\%) / 16,15$		
External exposure	15,690675	mg/person	External exposure	3,2950418	mg/person
External exposure	0,2615113	mg/kg bw/d	External exposure	0,2040274	mg/kg bw/d
Absorbed dose:	0,0235360	mg/kg bw/d	Absorbed dose:	0,0183625	mg/kg bw/d
Bystander: Inhalation exposure after application in Pome fruits, Stone fruits					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
$(0,018 / 360 \times 0,9975 \times 8 \times 5 \times 100\%) / 60$			$(0,010 / 360 \times 0,9975 \times 8 \times 5 \times 100\%) / 16,15$		
External exposure	0,001995	mg/person	External exposure	0,0011466	mg/person
External exposure	3,325E-05	mg/kg bw/d	External exposure	7,099E-05	mg/kg bw/d
Absorbed dose:	0,0000333	mg/kg bw/d	Absorbed dose:	0,0000710	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		

Total systemic exposure (absorbed dose)	1,4141558	mg/person	Total systemic exposure (absorbed dose)	0,2977003	mg/person
Total systemic exposure (absorbed dose)	0,0235693	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0184335	mg/kg bw/d
% of AOEL:	29,46	%	% of AOEL:	23,04	%

Table A 88: Input parameters considered for the estimation of resident exposure

Intended use(s):	Pome fruits, Stone fruits		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 89: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Pome fruits, Stone fruits (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,009975 x 1 x 15,73% x 5% x 7300 x 2 x 9%) / 60			(0,009975 x 1 x 15,73% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,1454193	mg/person	External exposure	0,4079576	mg/person
External exposure	0,0190903	mg/kg bw/d	External exposure	0,0252605	mg/kg bw/d
Absorbed dose:	0,0017181	mg/kg bw/d	Absorbed dose:	0,0022734	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d

			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,009975 \times 1 \times 15,73\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
External exposure			0,0313814	mg/person	
External exposure			0,0019431	mg/kg bw/d	
Absorbed dose			0,0009716	mg/kg bw/d	
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,009975 \times 1 \times 15,73\% \times 20\% \times 25 \times 50\%) / 16,15$		
External exposure			0,0078453	mg/person	
External exposure			0,0004858	mg/kg bw/d	
Absorbed dose			0,0002429	mg/kg bw/d	
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1196577	mg/person	Total systemic exposure (absorbed dose)	0,0646395	mg/person
Total systemic exposure (absorbed dose)	0,0019943	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0040024	mg/kg bw/d
% of AOEL:	2,49	%	% of AOEL:	5,00	%

Manual Knapsack application to high crops

Table A 90: Input parameters considered for the estimation of acute bystander exposure

Intended use(s):	Pome fruits, Stone fruits		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 91: Estimation of acute bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper	
Adults	Children
Bystander: Dermal exposure after application in Pome fruits, Stone fruits (via spray drift)	
$SDE_B = (AR \times D \times BSA \times DA) / BW$	$SDE_B = (AR \times D \times BSA \times DA) / BW$
$(99,75 \times 15,73\% \times 1 \times 9\%) / 60$	$(99,75 \times 15,73\% \times 0,21 \times 9\%) / 16,15$

External exposure	15,690675	mg/person	External exposure	3,2950418	mg/person
External exposure	0,2615113	mg/kg bw/d	External exposure	0,2040274	mg/kg bw/d
Absorbed dose:	0,0235360	mg/kg bw/d	Absorbed dose:	0,0183625	mg/kg bw/d
Bystander: Inhalation exposure after application in Pome fruits, Stone fruits					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
$(0,300 / 360 \times 0,9975 \times 1 \times 5 \times 100\%) / 60$			$(0,172 / 360 \times 0,9975 \times 1 \times 5 \times 100\%) / 16,15$		
External exposure	0,0041563	mg/person	External exposure	0,0023886	mg/person
External exposure	6,927E-05	mg/kg bw/d	External exposure	0,0001479	mg/kg bw/d
Absorbed dose:	0,0000693	mg/kg bw/d	Absorbed dose:	0,0001479	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		
Total systemic exposure (absorbed dose)	1,416317	mg/person	Total systemic exposure (absorbed dose)	0,2989424	mg/person
Total systemic exposure (absorbed dose)	0,0236053	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0185104	mg/kg bw/d
% of AOEL:	29,51	%	% of AOEL:	23,14	%

Table A 92: Input parameters considered for the estimation of resident exposure

Intended use(s):	Pome fruits, Stone fruits		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	0,9975	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 93: Estimation of longer term resident exposure towards copper according to EF-SA guidance

Resident exposure towards copper	
Adults	Children
Residents: Dermal exposure after application in Pome fruits, Stone fruits (via deposits caused by spray drift)	
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$	$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$

$(0,009975 \times 1 \times 15,73\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,009975 \times 1 \times 15,73\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,1454193	mg/person	External exposure	0,4079576	mg/person
External exposure	0,0190903	mg/kg bw/d	External exposure	0,0252605	mg/kg bw/d
Absorbed dose:	0,0017181	mg/kg bw/d	Absorbed dose:	0,0022734	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,009975 \times 1 \times 15,73\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,0313814	mg/person
			External exposure	0,0019431	mg/kg bw/d
			Absorbed dose	0,0009716	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,009975 \times 1 \times 15,73\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0078453	mg/person
			External exposure	0,0004858	mg/kg bw/d
			Absorbed dose	0,0002429	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1196577	mg/person	Total systemic exposure (absorbed dose)	0,0646395	mg/person
Total systemic exposure (absorbed dose)	0,0019943	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0040024	mg/kg bw/d
% of AOEL:	2,49	%	% of AOEL:	5,00	%

Stone fruits: Cherry, sweet cherry, apricot, plum, peach

Tractor mounted boom spray application outdoors to high crops

Table A 94: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Stone fruits		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	1,05	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I*_A):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)

Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 95: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Stone fruits (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(105 x 15,73% x 1 x 9%) / 60			(105 x 15,73% x 0,21 x 9%) / 16,15		
External exposure	16,5165	mg/person	External exposure	3,468465	mg/person
External exposure	0,275275	mg/kg bw/d	External exposure	0,2147656	mg/kg bw/d
Absorbed dose:	0,0247748	mg/kg bw/d	Absorbed dose:	0,0193289	mg/kg bw/d
Bystander: Inhalation exposure after application in Stone fruits					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,018 / 360 x 1,05 x 8 x 5 x 100%) / 60			(0,010 / 360 x 1,05 x 8 x 5 x 100%) / 16,15		
External exposure	0,0021	mg/person	External exposure	0,0012069	mg/person
External exposure	0,000035	mg/kg bw/d	External exposure	7,473E-05	mg/kg bw/d
Absorbed dose:	0,0000350	mg/kg bw/d	Absorbed dose:	0,0000747	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,488585	mg/person	Total systemic exposure (absorbed dose)	0,3133687	mg/person
Total systemic exposure (absorbed dose)	0,0248098	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0194036	mg/kg bw/d
% of AOEL:	31,01	%	% of AOEL:	24,25	%

Table A 96: Input parameters considered for the estimation of resident exposure

Intended use(s):	Stone fruits		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	1,05	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²

			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 97: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Stone fruits (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0105 x 1 x 15,73% x 5% x 7300 x 2 x 9%) / 60			(0,0105 x 1 x 15,73% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,2057045	mg/person	External exposure	0,429429	mg/person
External exposure	0,0200951	mg/kg bw/d	External exposure	0,02659	mg/kg bw/d
Absorbed dose:	0,0018086	mg/kg bw/d	Absorbed dose:	0,0023931	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,0105 x 1 x 15,73% x 5% x 50% x 20 x 20 x 2 x 50%) / 16,15		
			External exposure	0,033033	mg/person
			External exposure	0,0020454	mg/kg bw/d
			Absorbed dose	0,0010227	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			SOE _O = (AR x NA x D x DFR x IgR x OA) / BW		
			(0,0105 x 1 x 15,73% x 20% x 25 x 50%) / 16,15		
			External exposure	0,0082583	mg/person
			External exposure	0,0005113	mg/kg bw/d
			Absorbed dose	0,0002557	mg/kg bw/d
Total systemic exposure: SE _R = SDE _R + SIE _R			Total systemic exposure: SE _R = SDE _R + SIE _R + SOE _H + SOE _O		
Total systemic exposure (absorbed dose)	0,1250834	mg/person	Total systemic exposure (absorbed dose)	0,0676042	mg/person
Total systemic exposure (absorbed dose)	0,0020847	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0041860	mg/kg bw/d
% of AOEL:	2,61	%	% of AOEL:	5,23	%

Manual Knapsack application to high crops

Table A 98: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Stone fruits		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	1,05	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 99: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Stone fruits (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(105 x 15,73% x 1 x 9%) / 60			(105 x 15,73% x 0,21 x 9%) / 16,15		
External exposure	16,5165	mg/person	External exposure	3,468465	mg/person
External exposure	0,275275	mg/kg bw/d	External exposure	0,2147656	mg/kg bw/d
Absorbed dose:	0,0247748	mg/kg bw/d	Absorbed dose:	0,0193289	mg/kg bw/d
Bystander: Inhalation exposure after application in Stone fruits					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 1,05 x 1 x 5 x 100%) / 60			(0,172 / 360 x 1,05 x 1 x 5 x 100%) / 16,15		
External exposure	0,004375	mg/person	External exposure	0,0025144	mg/person
External exposure	7,292E-05	mg/kg bw/d	External exposure	0,0001557	mg/kg bw/d
Absorbed dose:	0,0000729	mg/kg bw/d	Absorbed dose:	0,0001557	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,49086	mg/person	Total systemic exposure (absorbed dose)	0,3146762	mg/person
Total systemic exposure (absorbed dose)	0,0248477	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0194846	mg/kg bw/d
% of AOEL:	31,06	%	% of AOEL:	24,36	%

Table A 100: Input parameters considered for the estimation of resident exposure

Intended use(s):	Stone fruits		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	1,05	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h

	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m3
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 101: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Stone fruits (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,0105 \times 1 \times 15,73\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,0105 \times 1 \times 15,73\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,2057045	mg/person	External exposure	0,429429	mg/person
External exposure	0,0200951	mg/kg bw/d	External exposure	0,02659	mg/kg bw/d
Absorbed dose:	0,0018086	mg/kg bw/d	Absorbed dose:	0,0023931	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0105 \times 1 \times 15,73\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,033033	mg/person
			External exposure	0,0020454	mg/kg bw/d
			Absorbed dose	0,0010227	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0105 \times 1 \times 15,73\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0082583	mg/person
			External exposure	0,0005113	mg/kg bw/d
			Absorbed dose	0,0002557	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		

Total systemic exposure (absorbed dose)	0,1250834	mg/person	Total systemic exposure (absorbed dose)	0,0676042	mg/person
Total systemic exposure (absorbed dose)	0,0020847	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0041860	mg/kg bw/d
% of AOEL:	2,61	%	% of AOEL:	5,23	%

Tree nuts Walnut, Hazelnut

Tractor mounted boom spray application outdoors to high crops

Table A 102: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Tree nuts		Drift (D):	19,89	% (HCTM, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 103: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Tree nuts (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(189 x 19,89% x 1 x 9%) / 60			(189 x 19,89% x 0,21 x 9%) / 16,15		
External exposure	37,5921	mg/person	External exposure	7,894341	mg/person
External exposure	0,626535	mg/kg bw/d	External exposure	0,4888137	mg/kg bw/d
Absorbed dose:	0,0563882	mg/kg bw/d	Absorbed dose:	0,0439932	mg/kg bw/d
Bystander: Inhalation exposure after application in Tree nuts					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,018 / 360 x 1,89 x 8 x 5 x 100%) / 60			(0,010 / 360 x 1,89 x 8 x 5 x 100%) / 16,15		
External exposure	0,00378	mg/person	External exposure	0,0021724	mg/person
External exposure	0,000063	mg/kg bw/d	External exposure	0,0001345	mg/kg bw/d
Absorbed dose:	0,0000630	mg/kg bw/d	Absorbed dose:	0,0001345	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	3,387069	mg/person	Total systemic exposure (absorbed dose)	0,7126631	mg/person
Total systemic exposure (absorbed dose)	0,0564512	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0441277	mg/kg bw/d

% of AOEL:	70,56	%	% of AOEL:	55,16	%
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Table A 104: Input parameters considered for the estimation of resident exposure

Intended use(s):	Tree nuts		Drift (D):	19,89	% (HCTM, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 105: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Tree nuts (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0189 x 1 x 29,2% x 5% x 7300 x 2 x 9%) / 60			(0,0189 x 1 x 29,2% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	2,7442233	mg/person	External exposure	0,9773946	mg/person
External exposure	0,0457371	mg/kg bw/d	External exposure	0,0605198	mg/kg bw/d
Absorbed dose:	0,0041163	mg/kg bw/d	Absorbed dose:	0,0054468	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,0189 x 1 x 29,2% x 5% x 50% x 20 x 20 x 2 x 50%) / 16,15		

			External exposure	0,0751842	mg/person
			External exposure	0,0046554	mg/kg bw/d
			Absorbed dose	0,0023277	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0189 \times 1 \times 29,2\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0187961	mg/person
			External exposure	0,0011638	mg/kg bw/d
			Absorbed dose	0,0005819	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,2635501	mg/person	Total systemic exposure (absorbed dose)	0,1432656	mg/person
Total systemic exposure (absorbed dose)	0,0043925	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0088709	mg/kg bw/d
% of AOEL:	5,49	%	% of AOEL:	11,09	%

Manual Knapsack application to high crops

Table A 106: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Tree nuts		Drift (D):	19,89	% (HCHH, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I^{*A}):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 107: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Tree nuts (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(189 x 19,89% x 1 x 9%) / 60			(189 x 19,89% x 0,21 x 9%) / 16,15		
External exposure	37,5921	mg/person	External exposure	7,894341	mg/person
External exposure	0,626535	mg/kg bw/d	External exposure	0,4888137	mg/kg bw/d

Absorbed dose:	0,0563882	mg/kg bw/d	Absorbed dose:	0,0439932	mg/kg bw/d
Bystander: Inhalation exposure after application in Tree nuts					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
(0,300 / 360 x 1,89 x 1 x 5 x 100%) / 60			(0,172 / 360 x 1,89 x 1 x 5 x 100%) / 16,15		
External exposure	0,007875	mg/person	External exposure	0,0045259	mg/person
External exposure	0,0001313	mg/kg bw/d	External exposure	0,0002802	mg/kg bw/d
Absorbed dose:	0,0001313	mg/kg bw/d	Absorbed dose:	0,0002802	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		
Total systemic exposure (absorbed dose)	3,391164	mg/person	Total systemic exposure (absorbed dose)	0,7150166	mg/person
Total systemic exposure (absorbed dose)	0,0565194	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0442735	mg/kg bw/d
% of AOEL:	70,65	%	% of AOEL:	55,34	%

Table A 108: Input parameters considered for the estimation of resident exposure

Intended use(s):	Tree nuts		Drift (D):	19,89	% (HCHH, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 109: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Tree nuts (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0189 x 1 x 29,2% x 5% x 7300 x 2 x 9%) / 60			(0,0189 x 1 x 29,2% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	2,7442233	mg/person	External exposure	0,9773946	mg/person

External exposure	0,0457371	mg/kg bw/d	External exposure	0,0605198	mg/kg bw/d
Absorbed dose:	0,0041163	mg/kg bw/d	Absorbed dose:	0,0054468	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0189 \times 1 \times 29,2\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,0751842	mg/person
			External exposure	0,0046554	mg/kg bw/d
			Absorbed dose	0,0023277	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0189 \times 1 \times 29,2\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0187961	mg/person
			External exposure	0,0011638	mg/kg bw/d
			Absorbed dose	0,0005819	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,2635501	mg/person	Total systemic exposure (absorbed dose)	0,1432656	mg/person
Total systemic exposure (absorbed dose)	0,0043925	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0088709	mg/kg bw/d
% of AOEL:	5,49	%	% of AOEL:	11,09	%

Fruiting vegetables (outdoor): Tomato, Aubergines, Cucumber, Gherkins, Courgette

Fruiting vegetables (indoor): Tomato, Aubergines, Melon, Pumpkins, Water-melon

Tractor mounted boom spray application outdoors to low crops

Table A 110: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Fruiting vegetables		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,275	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I^{*A}):	0,001	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,00057	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	20	ha/d (based on Field Crops, Tractor Mounted (FCTM))

Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 111: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Fruiting vegetables (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(227,5 x 8,5% x 1 x 9%) / 60			(227,5 x 8,5% x 0,21 x 9%) / 16,15		
External exposure	19,3375	mg/person	External exposure	4,060875	mg/person
External exposure	0,3222917	mg/kg bw/d	External exposure	0,2514474	mg/kg bw/d
Absorbed dose:	0,0290063	mg/kg bw/d	Absorbed dose:	0,0226303	mg/kg bw/d
Bystander: Inhalation exposure after application in Fruiting vegetables					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,001 / 360 x 2,275 x 20 x 5 x 100%) / 60			(0,001 / 360 x 2,275 x 20 x 5 x 100%) / 16,15		
External exposure	0,0006319	mg/person	External exposure	0,0003632	mg/person
External exposure	1,053E-05	mg/kg bw/d	External exposure	2,249E-05	mg/kg bw/d
Absorbed dose:	0,0000105	mg/kg bw/d	Absorbed dose:	0,0000225	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,7410069	mg/person	Total systemic exposure (absorbed dose)	0,3658419	mg/person
Total systemic exposure (absorbed dose)	0,0290168	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0226528	mg/kg bw/d
% of AOEL:	36,27	%	% of AOEL:	28,32	%

Table A 112: Input parameters considered for the estimation of resident exposure

Intended use(s):	Fruiting vegetables		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,275	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h

			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 113: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Fruiting vegetables (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,02275 x 1 x 0% x 5% x 7300 x 2 x 9%) / 60			(0,02275 x 1 x 0% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,4116375	mg/person	External exposure	0,502775	mg/person
External exposure	0,0235273	mg/kg bw/d	External exposure	0,0311316	mg/kg bw/d
Absorbed dose:	0,0021175	mg/kg bw/d	Absorbed dose:	0,0028018	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,02275 x 1 x 0% x 5% x 50% x 20 x 20 x 2 x 50%) / 16,15		
			External exposure	0,038675	mg/person
			External exposure	0,0023947	mg/kg bw/d
			Absorbed dose	0,0011974	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			SOE _O = (AR x NA x D x DFR x IgR x OA) / BW		
			(0,02275 x 1 x 0% x 20% x 25 x 50%) / 16,15		
			External exposure	0,0096688	mg/person
			External exposure	0,0005987	mg/kg bw/d
			Absorbed dose	0,0002993	mg/kg bw/d
Total systemic exposure: SE _R = SDE _R + SIE _R			Total systemic exposure: SE _R = SDE _R + SIE _R + SOE _H + SOE _O		
Total systemic exposure (absorbed dose)	0,1436174	mg/person	Total systemic exposure (absorbed dose)	0,0777316	mg/person
Total systemic exposure (absorbed dose)	0,0023936	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0048131	mg/kg bw/d
% of AOEL:	2,99	%	% of AOEL:	6,02	%

Manual Knapsack application to low crops

Table A 114: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Fruiting vegetables	Drift (D):	8,50	% (HCHH, 3 m)
Application rate (AR):	2,275	Exposed Body Surface	1	m ² (adults)

			Area (BSA):	0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I*_A):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 115: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Fruiting vegetables (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(227,5 x 8,5% x 1 x 9%) / 60			(227,5 x 8,5% x 0,21 x 9%) / 16,15		
External exposure	19,3375	mg/person	External exposure	4,060875	mg/person
External exposure	0,3222917	mg/kg bw/d	External exposure	0,2514474	mg/kg bw/d
Absorbed dose:	0,0290063	mg/kg bw/d	Absorbed dose:	0,0226303	mg/kg bw/d
Bystander: Inhalation exposure after application in Fruiting vegetables					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 2,275 x 1 x 5 x 100%) / 60			(0,172 / 360 x 2,275 x 1 x 5 x 100%) / 16,15		
External exposure	0,0094792	mg/person	External exposure	0,0054478	mg/person
External exposure	0,000158	mg/kg bw/d	External exposure	0,0003373	mg/kg bw/d
Absorbed dose:	0,0001580	mg/kg bw/d	Absorbed dose:	0,0003373	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,7498542	mg/person	Total systemic exposure (absorbed dose)	0,3709265	mg/person
Total systemic exposure (absorbed dose)	0,0291642	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0229676	mg/kg bw/d
% of AOEL:	36,46	%	% of AOEL:	28,71	%

Table A 116: Input parameters considered for the estimation of resident exposure

Intended use(s):	Fruiting vegetables		Drift (D):	8,50	% (HCHH, 3 m)
Application rate (AR):	2,275	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),

Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 117: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Fruiting vegetables (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,02275 x 1 x 8,02% x 5% x 7300 x 2 x 9%) / 60			(0,02275 x 1 x 8,02% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,4116375	mg/person	External exposure	0,502775	mg/person
External exposure	0,0235273	mg/kg bw/d	External exposure	0,0311316	mg/kg bw/d
Absorbed dose:	0,0021175	mg/kg bw/d	Absorbed dose:	0,0028018	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,02275 x 1 x 8,02% x 5% x 50% x 20 x 20 x 2 x 50%) / 16,15		
			External exposure	0,038675	mg/person
			External exposure	0,0023947	mg/kg bw/d
			Absorbed dose	0,0011974	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			SOE _O = (AR x NA x D x DFR x IgR x OA) / BW		
			(0,02275 x 1 x 8,02% x 20% x 25 x 50%) / 16,15		
			External exposure	0,0096688	mg/person
			External exposure	0,0005987	mg/kg bw/d
			Absorbed dose	0,0002993	mg/kg bw/d
Total systemic exposure: SE _R = SDE _R + SIE _R			Total systemic exposure: SE _R = SDE _R + SIE _R + SOE _H + SOE _O		
Total systemic exposure (absorbed dose)	0,1436174	mg/person	Total systemic exposure (absorbed dose)	0,0777316	mg/person
Total systemic exposure (absorbed dose)	0,0023936	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0048131	mg/kg bw/d

% of AOEL:	2,99	%	% of AOEL:	6,02	%
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Fruiting vegetables (indoor): cucumber

Table A 118: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Fruiting vegetables - cucumber		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,56	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A):	0,001	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,00057	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	20	ha/d (based on Field Crops, Tractor Mounted (FCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 119: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Fruiting vegetables - cucumber (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(256 x 8,5% x 1 x 9%) / 60			(256 x 8,5% x 0,21 x 9%) / 16,15		
External exposure	21,76	mg/person	External exposure	4,5696	mg/person
External exposure	0,3626667	mg/kg bw/d	External exposure	0,2829474	mg/kg bw/d
Absorbed dose:	0,0326400	mg/kg bw/d	Absorbed dose:	0,0254653	mg/kg bw/d
Bystander: Inhalation exposure after application in Fruiting vegetables - cucumber					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,001 / 360 x 2,56 x 20 x 5 x 100%) / 60			(0,001 / 360 x 2,56 x 20 x 5 x 100%) / 16,15		
External exposure	0,0007111	mg/person	External exposure	0,0004087	mg/person
External exposure	1,185E-05	mg/kg bw/d	External exposure	2,531E-05	mg/kg bw/d
Absorbed dose:	0,0000119	mg/kg bw/d	Absorbed dose:	0,0000253	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,9591111	mg/person	Total systemic exposure (absorbed dose)	0,4116727	mg/person
Total systemic exposure (absorbed dose)	0,0326519	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0254906	mg/kg bw/d
% of AOEL:	40,81	%	% of AOEL:	31,86	%

Table A 120: Input parameters considered for the estimation of resident exposure

Intended use(s):	Fruiting vegetables - cucumber		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,56	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 121: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Fruiting vegetables - cucumber (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0256 x 1 x 0% x 5% x 7300 x 2 x 9%) / 60			(0,0256 x 1 x 0% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,58848	mg/person	External exposure	0,56576	mg/person
External exposure	0,0264747	mg/kg bw/d	External exposure	0,0350316	mg/kg bw/d
Absorbed dose:	0,0023827	mg/kg bw/d	Absorbed dose:	0,0031528	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			SOE _H = (AR x NA x D x TTR x SE x SA x Freq x H x OA) / BW		
			(0,0256 x 1 x 0% x 5% x 50% x 20 x 20 x 2 x 50%) / 16,15		
			External exposure	0,04352	mg/person
			External exposure	0,0026947	mg/kg bw/d

			Absorbed dose	0,0013474	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_o = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0256 \times 1 \times 0\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,01088	mg/person
			External exposure	0,0006737	mg/kg bw/d
			Absorbed dose	0,0003368	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_o$		
Total systemic exposure (absorbed dose)	0,1595332	mg/person	Total systemic exposure (absorbed dose)	0,0864284	mg/person
Total systemic exposure (absorbed dose)	0,0026589	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0053516	mg/kg bw/d
% of AOEL:	3,32	%	% of AOEL:	6,69	%

Manual Knapsack application to high crops

Table A 122: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Fruiting vegetables - cucumber		Drift (D):	8,50	% (HCHH, 1 m)
Application rate (AR):	2,56	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 123: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Fruiting vegetables - cucumber (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(256 x 8,5% x 1 x 9%) / 60			(256 x 8,5% x 0,21 x 9%) / 16,15		
External exposure	21,76	mg/person	External exposure	4,5696	mg/person
External exposure	0,3626667	mg/kg bw/d	External exposure	0,2829474	mg/kg bw/d
Absorbed dose:	0,0326400	mg/kg bw/d	Absorbed dose:	0,0254653	mg/kg bw/d
Bystander: Inhalation exposure after application in Fruiting vegetables - cucumber					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 2,56 x 1 x 5 x 100%) / 60			(0,172 / 360 x 2,56 x 1 x 5 x 100%) / 16,15		
External exposure	0,0106667	mg/person	External exposure	0,0061303	mg/person
External exposure	0,0001778	mg/kg bw/d	External exposure	0,0003796	mg/kg bw/d
Absorbed dose:	0,0001778	mg/kg bw/d	Absorbed dose:	0,0003796	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		

Total systemic exposure (absorbed dose)	1,9690667	mg/person	Total systemic exposure (absorbed dose)	0,4173943	mg/person
Total systemic exposure (absorbed dose)	0,0328178	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0258448	mg/kg bw/d
% of AOEL:	41,02	%	% of AOEL:	32,31	%

Table A 124: Input parameters considered for the estimation of resident exposure

Intended use(s):	Fruiting vegetables - cucumber		Drift (D):	8,50	% (HCHH, 1 m)
Application rate (AR):	2,56	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 125: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Fruiting vegetables - cucumber (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0256 x 1 x 2,77% x 5% x 7300 x 2 x 9%) / 60			(0,0256 x 1 x 2,77% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	1,58848	mg/person	External exposure	0,56576	mg/person
External exposure	0,0264747	mg/kg bw/d	External exposure	0,0350316	mg/kg bw/d
Absorbed dose:	0,0023827	mg/kg bw/d	Absorbed dose:	0,0031528	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0.0002762	mg/kg bw/d	External exposure	0.0005146	mg/kg bw/d

Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0256 \times 1 \times 2,77\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,04352	mg/person
			External exposure	0,0026947	mg/kg bw/d
			Absorbed dose	0,0013474	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0256 \times 1 \times 2,77\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,01088	mg/person
			External exposure	0,0006737	mg/kg bw/d
			Absorbed dose	0,0003368	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1595332	mg/person	Total systemic exposure (absorbed dose)	0,0864284	mg/person
Total systemic exposure (absorbed dose)	0,0026589	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0053516	mg/kg bw/d
% of AOEL:	3,32	%	% of AOEL:	6,69	%

Legume vegetables: French bean, Peas with pods, Bean with pods
Tractor mounted boom spray application outdoors to low crops

Table A 126: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Legume vegetables		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,275	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I*_A):	0,001	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,00057	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	20	ha/d (based on Field Crops, Tractor Mounted (FCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 127: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper	
Adults	Children
Bystander: Dermal exposure after application in Legume vegetables (via spray drift)	
$SDE_B = (AR \times D \times BSA \times DA) / BW$	$SDE_B = (AR \times D \times BSA \times DA) / BW$

$(227,5 \times 8,5\% \times 1 \times 9\%) / 60$			$(227,5 \times 8,5\% \times 0,21 \times 9\%) / 16,15$		
External exposure	19,3375	mg/person	External exposure	4,060875	mg/person
External exposure	0,3222917	mg/kg bw/d	External exposure	0,2514474	mg/kg bw/d
Absorbed dose:	0,0290063	mg/kg bw/d	Absorbed dose:	0,0226303	mg/kg bw/d
Bystander: Inhalation exposure after application in Legume vegetables					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
$(0,001 / 360 \times 2,275 \times 20 \times 5 \times 100\%) / 60$			$(0,001 / 360 \times 2,275 \times 20 \times 5 \times 100\%) / 16,15$		
External exposure	0,0006319	mg/person	External exposure	0,0003632	mg/person
External exposure	1,053E-05	mg/kg bw/d	External exposure	2,249E-05	mg/kg bw/d
Absorbed dose:	0,0000105	mg/kg bw/d	Absorbed dose:	0,0000225	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		
Total systemic exposure (absorbed dose)	1,7410069	mg/person	Total systemic exposure (absorbed dose)	0,3658419	mg/person
Total systemic exposure (absorbed dose)	0,0290168	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0226528	mg/kg bw/d
% of AOEL:	36,27	%	% of AOEL:	28,32	%

Table A 128: Input parameters considered for the estimation of resident exposure

Intended use(s):	Legume vegetables		Drift (D):	8,50	% (FCTM, 0 m)
Application rate (AR):	2,275	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 129: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper	
Adults	Children

Residents: Dermal exposure after application in Legume vegetables (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,02275 \times 1 \times 0\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,02275 \times 1 \times 0\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,4116375	mg/person	External exposure	0,502775	mg/person
External exposure	0,0235273	mg/kg bw/d	External exposure	0,0311316	mg/kg bw/d
Absorbed dose:	0,0021175	mg/kg bw/d	Absorbed dose:	0,0028018	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_v \times IR \times IA) / BW$			$SIE_R = (AC_v \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,02275 \times 1 \times 0\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,038675	mg/person
			External exposure	0,0023947	mg/kg bw/d
			Absorbed dose	0,0011974	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,02275 \times 1 \times 0\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0096688	mg/person
			External exposure	0,0005987	mg/kg bw/d
			Absorbed dose	0,0002993	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1436174	mg/person	Total systemic exposure (absorbed dose)	0,0777316	mg/person
Total systemic exposure (absorbed dose)	0,0023936	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0048131	mg/kg bw/d
% of AOEL:	2,99	%	% of AOEL:	6,02	%

Manual Knapsack application to high crops

Table A 130: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Legume vegetables		Drift (D):	8,50	% (HCHH, 1 m)
Application rate (AR):	2,275	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I*_A):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))

Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 131: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Legume vegetables (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(227,5 x 8,5% x 1 x 9%) / 60			(227,5 x 8,5% x 0,21 x 9%) / 16,15		
External exposure	19,3375	mg/person	External exposure	4,060875	mg/person
External exposure	0,3222917	mg/kg bw/d	External exposure	0,2514474	mg/kg bw/d
Absorbed dose:	0,0290063	mg/kg bw/d	Absorbed dose:	0,0226303	mg/kg bw/d
Bystander: Inhalation exposure after application in Legume vegetables					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 2,275 x 1 x 5 x 100%) / 60			(0,172 / 360 x 2,275 x 1 x 5 x 100%) / 16,15		
External exposure	0,0094792	mg/person	External exposure	0,0054478	mg/person
External exposure	0,000158	mg/kg bw/d	External exposure	0,0003373	mg/kg bw/d
Absorbed dose:	0,0001580	mg/kg bw/d	Absorbed dose:	0,0003373	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,7498542	mg/person	Total systemic exposure (absorbed dose)	0,3709265	mg/person
Total systemic exposure (absorbed dose)	0,0291642	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0229676	mg/kg bw/d
% of AOEL:	36,46	%	% of AOEL:	28,71	%

Table A 132: Input parameters considered for the estimation of resident exposure

Intended use(s):	Legume vegetables		Drift (D):	8,50	% (HCHH, 1 m)
Application rate (AR):	2,275	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h

			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 133: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Legume vegetables (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,02275 \times 1 \times 2,77\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,02275 \times 1 \times 2,77\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,4116375	mg/person	External exposure	0,502775	mg/person
External exposure	0,0235273	mg/kg bw/d	External exposure	0,0311316	mg/kg bw/d
Absorbed dose:	0,0021175	mg/kg bw/d	Absorbed dose:	0,0028018	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,02275 \times 1 \times 2,77\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,038675	mg/person
			External exposure	0,0023947	mg/kg bw/d
			Absorbed dose	0,0011974	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,02275 \times 1 \times 2,77\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0096688	mg/person
			External exposure	0,0005987	mg/kg bw/d
			Absorbed dose	0,0002993	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1436174	mg/person	Total systemic exposure (absorbed dose)	0,0777316	mg/person
Total systemic exposure (absorbed dose)	0,0023936	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0048131	mg/kg bw/d
% of AOEL:	2,99	%	% of AOEL:	6,02	%

Table and wine grapes: Grape

Tractor mounted boom spray application outdoors to high crops

Table A 134: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Grape		Drift (D):	8,02	% (HCTM, 3 m)
Application rate (AR):	2,52	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 135: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Grape (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(252 x 8,02% x 1 x 9%) / 60			(252 x 8,02% x 0,21 x 9%) / 16,15		
External exposure	20,2104	mg/person	External exposure	4,244184	mg/person
External exposure	0,33684	mg/kg bw/d	External exposure	0,2627978	mg/kg bw/d
Absorbed dose:	0,0303156	mg/kg bw/d	Absorbed dose:	0,0236518	mg/kg bw/d
Bystander: Inhalation exposure after application in Grape					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,018 / 360 x 2,52 x 8 x 5 x 100%) / 60			(0,010 / 360 x 2,52 x 8 x 5 x 100%) / 16,15		
External exposure	0,00504	mg/person	External exposure	0,0028966	mg/person
External exposure	0,000084	mg/kg bw/d	External exposure	0,0001794	mg/kg bw/d
Absorbed dose:	0,0000840	mg/kg bw/d	Absorbed dose:	0,0001794	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,823976	mg/person	Total systemic exposure (absorbed dose)	0,3848731	mg/person
Total systemic exposure (absorbed dose)	0,0303996	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0238312	mg/kg bw/d
% of AOEL:	38,00	%	% of AOEL:	29,79	%

Table A 136: Input parameters considered for the estimation of resident exposure

Intended use(s):	Grape		Drift (D):	8,02	% (HCTM, 3 m)
Application rate (AR):	2,52	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h

	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 137: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Grape (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,0252 \times 1 \times 15,73\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,0252 \times 1 \times 15,73\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,4753592	mg/person	External exposure	0,5254704	mg/person
External exposure	0,0245893	mg/kg bw/d	External exposure	0,0325369	mg/kg bw/d
Absorbed dose:	0,0022130	mg/kg bw/d	Absorbed dose:	0,0029283	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0252 \times 1 \times 15,73\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,0404208	mg/person
			External exposure	0,0025028	mg/kg bw/d
			Absorbed dose	0,0012514	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0252 \times 1 \times 15,73\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0101052	mg/person
			External exposure	0,0006257	mg/kg bw/d
			Absorbed dose	0,0003129	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		

Total systemic exposure (absorbed dose)	0,1493523	mg/person	Total systemic exposure (absorbed dose)	0,0808653	mg/person
Total systemic exposure (absorbed dose)	0,0024892	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0050071	mg/kg bw/d
% of AOEL:	3,11	%	% of AOEL:	6,26	%

Manual Knapsack application to high crops

Table A 138: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Grape		Drift (D):	8,02	% (HCHH, 3 m)
Application rate (AR):	2,52	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 139: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Grape (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(252 x 8,02% x 1 x 9%) / 60			(252 x 8,02% x 0,21 x 9%) / 16,15		
External exposure	20,2104	mg/person	External exposure	4,244184	mg/person
External exposure	0,33684	mg/kg bw/d	External exposure	0,2627978	mg/kg bw/d
Absorbed dose:	0,0303156	mg/kg bw/d	Absorbed dose:	0,0236518	mg/kg bw/d
Bystander: Inhalation exposure after application in Grape					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,300 / 360 x 2,52 x 1 x 5 x 100%) / 60			(0,172 / 360 x 2,52 x 1 x 5 x 100%) / 16,15		
External exposure	0,0105	mg/person	External exposure	0,0060345	mg/person
External exposure	0,000175	mg/kg bw/d	External exposure	0,0003737	mg/kg bw/d
Absorbed dose:	0,0001750	mg/kg bw/d	Absorbed dose:	0,0003737	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		
Total systemic exposure (absorbed dose)	1,829436	mg/person	Total systemic exposure (absorbed dose)	0,388011	mg/person
Total systemic exposure (absorbed dose)	0,0304906	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0240255	mg/kg bw/d
% of AOEL:	38,11	%	% of AOEL:	30,03	%

Table A 140: Input parameters considered for the estimation of resident exposure

Intended use(s):	Grape	Drift (D):	8,02	% (HCHH, 3 m)
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Application rate (AR):	2,52	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 141: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Grape (via deposits caused by spray drift)					
$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$			$SDE_R = (AR \times NA \times D \times TTR \times TC \times H \times DA) / BW$		
$(0,0252 \times 1 \times 15,73\% \times 5\% \times 7300 \times 2 \times 9\%) / 60$			$(0,0252 \times 1 \times 15,73\% \times 5\% \times 2600 \times 2 \times 9\%) / 16,15$		
External exposure	1,4753592	mg/person	External exposure	0,5254704	mg/person
External exposure	0,0245893	mg/kg bw/d	External exposure	0,0325369	mg/kg bw/d
Absorbed dose:	0,0022130	mg/kg bw/d	Absorbed dose:	0,0029283	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0252 \times 1 \times 15,73\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,0404208	mg/person
			External exposure	0,0025028	mg/kg bw/d
			Absorbed dose	0,0012514	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$					

			(0,0252 x 1 x 15,73% x 20% x 25 x 50%) / 16,15		
			External exposure	0,0101052	mg/person
			External exposure	0,0006257	mg/kg bw/d
			Absorbed dose	0,0003129	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,1493523	mg/person	Total systemic exposure (absorbed dose)	0,0808653	mg/person
Total systemic exposure (absorbed dose)	0,0024892	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0050071	mg/kg bw/d
% of AOEL:	3,11	%	% of AOEL:	6,26	%

Berries and small fruits: Currant

Tractor mounted boom spray application outdoors to high crops

Table A 142: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Currant		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I^*_A):	0,018	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,01034	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	8	ha/d (based on High crops, tractor mounted (HCTM))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 143: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Currant (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(189 x 15,73% x 1 x 9%) / 60			(189 x 15,73% x 0,21 x 9%) / 16,15		
External exposure	29,7297	mg/person	External exposure	6,243237	mg/person
External exposure	0,495495	mg/kg bw/d	External exposure	0,3865781	mg/kg bw/d
Absorbed dose:	0,0445946	mg/kg bw/d	Absorbed dose:	0,0347920	mg/kg bw/d
Bystander: Inhalation exposure after application in Currant					
SIE _B = (I* _A x AR x A x T x IA) / BW			SIE _B = (I* _A x AR x A x T x IA) / BW		
(0,018 / 360 x 1,89 x 8 x 5 x 100%) / 60			(0,010 / 360 x 1,89 x 8 x 5 x 100%) / 16,15		
External exposure	0,00378	mg/person	External exposure	0,0021724	mg/person
External exposure	0,000063	mg/kg bw/d	External exposure	0,0001345	mg/kg bw/d
Absorbed dose:	0,0000630	mg/kg bw/d	Absorbed dose:	0,0001345	mg/kg bw/d
Total systemic exposure: SE _B = SDE _B + SIE _B			Total systemic exposure: SE _B = SDE _B + SIE _B		

Total systemic exposure (absorbed dose)	2,679453	mg/person	Total systemic exposure (absorbed dose)	0,5640637	mg/person
Total systemic exposure (absorbed dose)	0,0446576	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0349265	mg/kg bw/d
% of AOEL:	55,82	%	% of AOEL:	43,66	%

Table A 144: Input parameters considered for the estimation of resident exposure

Intended use(s):	Currant		Drift (D):	15,73	% (HCTM, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 145: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Currant (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0189 x 1 x 8,02% x 5% x 7300 x 2 x 9%) / 60			(0,0189 x 1 x 8,02% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	2,1702681	mg/person	External exposure	0,7729722	mg/person
External exposure	0,0361711	mg/kg bw/d	External exposure	0,0478621	mg/kg bw/d
Absorbed dose:	0,0032554	mg/kg bw/d	Absorbed dose:	0,0043076	mg/kg bw/d
Residents: Inhalation exposure to vapour					
SIE _R = (AC _V x IR x IA) / BW			SIE _R = (AC _V x IR x IA) / BW		
(0,001 x 16,57 x 100%) / 60			(0,001 x 8,31 x 100%) / 16,15		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d

			Residents: Oral exposure (hand-to-mouth transfer)		
			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
			$(0,0189 \times 1 \times 8,02\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
			External exposure	0,0594594	mg/person
			External exposure	0,0036817	mg/kg bw/d
			Absorbed dose	0,0018408	mg/kg bw/d
			Residents: Oral exposure (object-to-mouth transfer)		
			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
			$(0,0189 \times 1 \times 8,02\% \times 20\% \times 25 \times 50\%) / 16,15$		
			External exposure	0,0148649	mg/person
External exposure	0,0009204	mg/kg bw/d			
Absorbed dose	0,0004602	mg/kg bw/d			
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,2118941	mg/person	Total systemic exposure (absorbed dose)	0,1150396	mg/person
Total systemic exposure (absorbed dose)	0,0035316	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0071232	mg/kg bw/d
% of AOEL:	4,41	%	% of AOEL:	8,90	%

Manual Knapsack application to high crops

Table A 146: Input parameters considered for the estimation of bystander exposure

Intended use(s):	Currant		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Exposed Body Surface Area (BSA):	1	m ² (adults)
				0,21	m ² (children)
Body weight (BW):	60	kg/person (adults)	Specific Inhalation Exposure (I_A[*]):	0,3	mg/kg a.s. (6 hours, adults)
	16,15	kg/person (children)		0,17241	mg/kg a.s. (6 hours, children)
Dermal absorption (DA):	9,00	% ('worst case')	Area Treated (A):	1	ha/d (based on High crops, hand held (HCHH))
Inhalation absorption (IA):	100	%	Exposure duration (T):	5	min
AOEL:	0,08	mg/kg bw/d			

Table A 147: Estimation of bystander exposure towards copper according to EFSA guidance

Bystander exposure towards copper					
Adults			Children		
Bystander: Dermal exposure after application in Currant (via spray drift)					
SDE _B = (AR x D x BSA x DA) / BW			SDE _B = (AR x D x BSA x DA) / BW		
(189 x 15,73% x 1 x 9%) / 60			(189 x 15,73% x 0,21 x 9%) / 16,15		
External exposure	29,7297	mg/person	External exposure	6,243237	mg/person
External exposure	0,495495	mg/kg bw/d	External exposure	0,3865781	mg/kg bw/d
Absorbed dose:	0,0445946	mg/kg bw/d	Absorbed dose:	0,0347920	mg/kg bw/d

Bystander: Inhalation exposure after application in Currant					
$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$			$SIE_B = (I^*_A \times AR \times A \times T \times IA) / BW$		
$(0,300 / 360 \times 1,89 \times 1 \times 5 \times 100\%) / 60$			$(0,172 / 360 \times 1,89 \times 1 \times 5 \times 100\%) / 16,15$		
External exposure	0,007875	mg/person	External exposure	0,0045259	mg/person
External exposure	0,0001313	mg/kg bw/d	External exposure	0,0002802	mg/kg bw/d
Absorbed dose:	0,0001313	mg/kg bw/d	Absorbed dose:	0,0002802	mg/kg bw/d
Total systemic exposure: $SE_B = SDE_B + SIE_B$			Total systemic exposure: $SE_B = SDE_B + SIE_B$		
Total systemic exposure (absorbed dose)	2,683548	mg/person	Total systemic exposure (absorbed dose)	0,5664172	mg/person
Total systemic exposure (absorbed dose)	0,0447258	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0350723	mg/kg bw/d
% of AOEL:	55,91	%	% of AOEL:	43,84	%

Table A 148: Input parameters considered for the estimation of resident exposure

Intended use(s):	Currant		Drift (D):	15,73	% (HCHH, 3 m)
Application rate (AR):	1,89	kg a.s./ha	Transfer coefficient (TC):	7300	cm ² /h (adults)
				2600	cm ² /h (children)
Number of applications (NA):	1		Turf Transferable Residues (TTR):	5	%
Body weight (BW):	60	kg/person (adults)	Exposure Duration (H):	2	h
	16,15	kg/person (children)	Airborne Concentration of Vapour (ACV):	0,001	mg/m ³
Dermal absorption (DA):	9,00	% ('worst case')	Inhalation Rate (IR):	16,57	m ³ /d (adults),
Inhalation absorption (IA):	100	%		8,31	m ³ /d (children)
Oral absorption (OA)	50	%	Saliva Extraction Factor (SE):	50	%
AOEL	0,08	mg/kg bw/d	Surface Area of Hands (SA):	20	cm ²
			Frequency of Hand to Mouth (Freq):	20	events/h
			Dislodgeable foliar residues (DFR):	20	%
			Ingestion Rate for Mouthing of Grass/Day (IgR):	25	cm ² /d

Table A 149: Estimation of resident exposure towards copper according to EFSA guidance

Resident exposure towards copper					
Adults			Children		
Residents: Dermal exposure after application in Currant (via deposits caused by spray drift)					
SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW			SDE _R = (AR x NA x D x TTR x TC x H x DA) / BW		
(0,0189 x 1 x 8,02% x 5% x 7300 x 2 x 9%) / 60			(0,0189 x 1 x 8,02% x 5% x 2600 x 2 x 9%) / 16,15		
External exposure	2,1702681	mg/person	External exposure	0,7729722	mg/person
External exposure	0,0361711	mg/kg bw/d	External exposure	0,0478621	mg/kg bw/d

Absorbed dose:	0,0032554	mg/kg bw/d	Absorbed dose:	0,0043076	mg/kg bw/d
Residents: Inhalation exposure to vapour					
$SIE_R = (AC_V \times IR \times IA) / BW$			$SIE_R = (AC_V \times IR \times IA) / BW$		
$(0,001 \times 16,57 \times 100\%) / 60$			$(0,001 \times 8,31 \times 100\%) / 16,15$		
External exposure	0,01657	mg/person	External exposure	0,00831	mg/person
External exposure	0,0002762	mg/kg bw/d	External exposure	0,0005146	mg/kg bw/d
Absorbed dose:	0,0002762	mg/kg bw/d	Absorbed dose:	0,0005146	mg/kg bw/d
Residents: Oral exposure (hand-to-mouth transfer)					
$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$			$SOE_H = (AR \times NA \times D \times TTR \times SE \times SA \times Freq \times H \times OA) / BW$		
$(0,0189 \times 1 \times 8,02\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$			$(0,0189 \times 1 \times 8,02\% \times 5\% \times 50\% \times 20 \times 20 \times 2 \times 50\%) / 16,15$		
External exposure	0,0594594	mg/person	External exposure	0,0594594	mg/person
External exposure	0,0036817	mg/kg bw/d	External exposure	0,0036817	mg/kg bw/d
Absorbed dose	0,0018408	mg/kg bw/d	Absorbed dose	0,0018408	mg/kg bw/d
Residents: Oral exposure (object-to-mouth transfer)					
$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$			$SOE_O = (AR \times NA \times D \times DFR \times IgR \times OA) / BW$		
$(0,0189 \times 1 \times 8,02\% \times 20\% \times 25 \times 50\%) / 16,15$			$(0,0189 \times 1 \times 8,02\% \times 20\% \times 25 \times 50\%) / 16,15$		
External exposure	0,0148649	mg/person	External exposure	0,0148649	mg/person
External exposure	0,0009204	mg/kg bw/d	External exposure	0,0009204	mg/kg bw/d
Absorbed dose	0,0004602	mg/kg bw/d	Absorbed dose	0,0004602	mg/kg bw/d
Total systemic exposure: $SE_R = SDE_R + SIE_R$			Total systemic exposure: $SE_R = SDE_R + SIE_R + SOE_H + SOE_O$		
Total systemic exposure (absorbed dose)	0,2118941	mg/person	Total systemic exposure (absorbed dose)	0,1150396	mg/person
Total systemic exposure (absorbed dose)	0,0035316	mg/kg bw/d	Total systemic exposure (absorbed dose)	0,0071232	mg/kg bw/d
% of AOEL:	4,41	%	% of AOEL:	8,90	%





A 3.4 Operator exposure calculations according to OPEX model v.0.3.22

A 3.4.1 Calculations for copper as copper oxychloride

A. Professional user

Pome frutis Apple, pear, Quince, Medlar
Stone frutis Cherry, sweet cherry, apricot, plum





Table A 150: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)	
Mixing/loading	Application	Normal & vehicle-mounted	Normal & manual-knapsack
		131	111
		41.6	8.8

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 0.525 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.03	41.6
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 0.525 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.007	8.8

Stone frutis Cherry, sweet cherry, apricot, plum

Table A 151: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22





Mixing/loading	Application	Copper oxychloride (% AOEL)	
		Normal & manual-knapsack	Normal & vehicle-mounted
		127	254
		11.9	76.2

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.01	11.9
Orchards/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride			

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
	M/L: Workwear App: Workwear	0.06	76.2

Stone frutis peach





Table A 152: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL)	
		Normal & manual-knapsack	Normal & vehicle-mounted
		127	254
		11.9	76.2

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.01	11.9
Orchards/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.06	76.2





Tree nuts Walnut, Hazelnut

Table A 153: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL)	
		Normal & manual-knapsack	Normal & vehicle-mounted
		127	254
		11.9	76.2

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.01	11.9
Orchards/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.06	76.2

Fruiting vegetables (outdoor)	
Tomato, Aubergines, Cucumber, Gherkins, Courgette	
Table A 154:	Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)	
Mixing/loading	Application	Normal & vehicle-mounted	Normal & manual-knapsack
		51.7	173
		32.8	22.9





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Outdoor/Downward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.03	32.8
Low vegetables/Outdoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride			

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
	M/L: Workwear App: Workwear	0.02	22.9

Fruiting vegetables (indoor)

Tomato, Aubergines, Melon, Pumpkins, Watermelon

Table A 155: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22





		Copper oxychloride (% AOEL)
Mixing/loading	Application	Normal & manual-knapsack
		76.4
		10.6

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Indoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 3 x 1.26 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.008	10.6

Fruiting vegetables (indoor)

Cucumber





Table A 156: Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)
Mixing/loading	Application	Normal & manual-knapsack
		49.8
		7.7

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Indoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 4 x 0.805 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
	M/L: Workwear App: Workwear	0.006	7.7

Legume vegetables French bean, Peas with pods	
Table A 157:	Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading  	Application  	Copper oxychloride (% AOEL)	
		Normal & vehicle-mounted	Normal & manual-knapsack
		213	122
		64.9	10.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
High vegetables/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.05	64.9
High vegetables/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.009	10.9

Table and wine grapes Grape	
Table A 158:	Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22





Mixing/loading  	Application  	Copper oxychloride (% AOEL)	
		Normal & vehicle-mounted	Normal & manual-knapsack
		254	127
		76.2	11.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Viticulture/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 3 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.06	76.2
Viticulture/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 3 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.01	11.9

Berries and small fruits

Currant

Table A 159: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)	
Mixing/loading	Application	Normal & vehicle-mounted	Normal & manual-knapsack
		254	127
		76.2	11.9





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Cane fruit/high berries/Outdoor/Upward spraying/Vehicle-mounted/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.06	76.2
Cane fruit/high berries/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
	M/L: Workwear App: Workwear	0.01	11.9

B. Non-professional user

Pome frutis Apple, pear, Quince, Medlar
Stone frutis Cherry, sweet cherry, apricot, plum





Table A 160: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)
Mixing/loading	Application	Normal & manual-knapsack
		111
		8.8

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 0.525 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.007	8.8

Stone frutis Cherry, sweet cherry, apricot, plum





Table A 161: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)
Mixing/loading	Application	Normal & manual-knapsack
		127
		11.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.01	11.9

Stone frutis peach





Table A 162: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL) Normal & manual-knapsack
		127
		11.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 1 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.01	11.9





Tree nuts Walnut, Hazelnut

Table A 163: Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL) Normal & manual-knapsack
		127
		11.9





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Orchards/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.01	11.9

Fruiting vegetables (outdoor)	
Tomato, Aubergines, Cucumber, Gherkins, Courgette	
Table A 164:	Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Copper oxychloride (% AOEL)		Normal & manual-knapsack
Mixing/loading	Application	
		173
		22.9





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Outdoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.02	22.9

Fruiting vegetables (indoor)	
Tomato, Aubergines, Melon, Pumpkins, Watermelon	
Table A 165:	Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL)
Mixing/loading	Application	Normal & manual-knapsack
		76.4
		10.6





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Indoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 3 x 1.26 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.008	10.6

Fruiting vegetables (indoor)	
Cucumber	
Table A 166:	Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL) Normal & manual-knapsack
Mixing/loading 	Application 	49.8
		7.7





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Low vegetables/Indoor/Downward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 4 x 0.805 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.006	7.7

Legume vegetables	
French bean, Peas with pods	
Table A 167:	Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22

		Copper oxychloride (% AOEL) Normal & manual-knapsack
Mixing/loading 	Application 	122
		10.9





Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
High vegetables/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 0.875 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.009	10.9

Table and wine grapes Grape	
Table A 168:	Estimation of longer term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL) Normal & manual-knapsack
		127
		11.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Viticulture/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Number of applications and application rate: 3 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %			
Copper oxychloride	M/L: Workwear App: Workwear	0.01	11.9

Berries and small fruits Currant	
Table A 169:	Estimation of short term operator exposure towards copper according to OPEX model v 0.3.22

Mixing/loading	Application	Copper oxychloride (% AOEL) Normal & manual-knapsack
		127
		11.9

Model data	Level of PPE	Total absorbed dose [mg/kg bw per day]	% of systemic AOEL
Cane fruit/high berries/Outdoor/Upward spraying/Manual-knapsack/Drift reduction: 0 %/75th percentile Crop density: Normal			
Copper oxychloride	Number of applications and application rate: 2 x 1.05 kg a.s./ha Dermal absorption (concentrate): 1 % Dermal absorption (in-use dilution): 9 %		
	M/L: Workwear App: Workwear	0.01	11.9

A 3.5 Combined exposure calculations for active substances

Not applicable.

Appendix 4 Detailed evaluation of exposure and/or DFR studies relied upon (KCP 7.2, KCP 7.2.1.1, KCP 7.2.2.1, KCP 7.2.3.1)