European Commission

Combined Draft Renewal Assessment Report prepared according to Regulation (EC) N° 1107/2009
and
Proposal for Harmonised Classification and Labelling (CLH Report) according to Regulation (EC) N° 1272/2008

Glyphosate

List of End Points

Rapporteur Member State : Assessment Group on Glyphosate (AGG) consisting of FR, HU, NL and SE

Version History

When	What
2021/06	Initial RAR

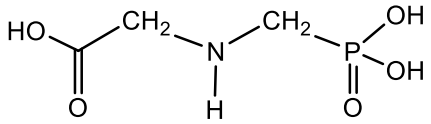
The RMS is the author of the Assessment Report. The Assessment Report is based on the validation by the RMS, and the verification during the EFSA peer-review process, of the information submitted by the Applicant in the dossier, including the Applicant's assessments provided in the summary dossier. As a consequence, data and information including assessments and conclusions, validated and verified by the RMS experts, may be taken from the applicant's (summary) dossier and included as such or adapted/modified by the RMS in the Assessment Report. For reasons of efficiency, the Assessment Report should include the information validated/verified by the RMS, without detailing which elements have been taken or modified from the Applicant's assessment. As the Applicant's summary dossier is published, the experts, interested parties, and the public may compare both documents for getting details on which elements of the Applicant's dossier have been validated/verified and which ones have been modified by the RMS. Nevertheless, the views and conclusions of the RMS should always be clearly and transparently reported; the conclusions from the applicant should be included as an Applicant's statement for every single study reported at study level; and the RMS should justify the final assessment for each endpoint in all cases, indicating in a clear way the Applicant's assessment and the RMS reasons for supporting or not the view of the Applicant.

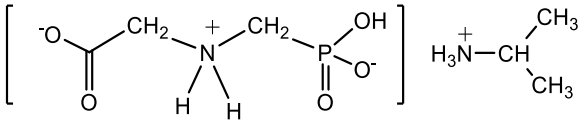
Identity, Physical and Chemical Properties, Details of Uses, Further Information (Regulation (EU) N° 283/2013, Annex Part A, points 1.3 and 3.2)

Active substance (ISO Common Name)	Glyphosate; N-(phosphonomethyl)glycine
Function (*e.g.* fungicide)	Herbicide

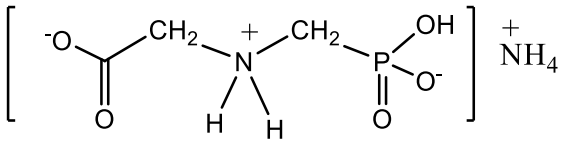
Rapporteur Member State	The Assessment Group on Glyphosate
Co-rapporteur Member State	None

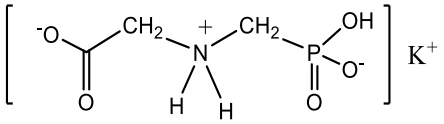
Identity (Regulation (EU) N° 283/2013, Annex Part A, point 1)

Chemical name (IUPAC)	*N*-(phosphonomethyl)glycine
Chemical name (CA)	Glycine, *N*-(phosphonomethyl)-
CIPAC No	284
CAS No	1071-83-6
EC No (EINECS or ELINCS)	213-997-4
FAO Specification (including year of publication)	284/TC (2014) applicable to material of Monsanto, Cheminova, Syngenta and Helm -Glyphosate: ≥ 950 g/kg -Formaldehyde: maximum 1.3 g/kg of the glyphosate acid -N-Nitroso-glyphosate: maximum 1 mg/kg of the glyphosate acid -Insolubles in 1 M NaOH: maximum 0.2 g/kg
Minimum purity of the active substance as manufactured	950 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Formaldehyde < 1 g/kg N-Nitroso-glyphosate (NNG) < 1 mg/kg Formic acid < 4 g/kg Triethylamine < 2 g/kg
Location of the (proposed) reference specification (for significant impurities)	RAR Volume 4 (2021)
Molecular formula	$C_3H_8NO_5P$
Molar mass	169.1 g/mol
Structural formula	

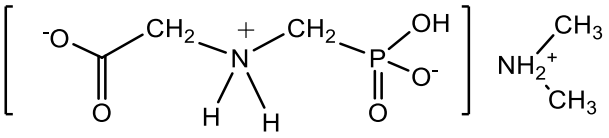
Chemical name (IUPAC)	N-(phosphonomethyl)glycine isopropylammonium
Chemical name (CA)	N-(phosphonomethyl)glycine isopropylammonium salt
CIPAC No	284.105
CAS No	38641-94-0
EC No (EINECS or ELINCS)	254-056-8
FAO Specification (including year of publication)	No FAO specification
Minimum purity of the active substance as manufactured	950 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Formaldehyde < 1 g/kg N-Nitroso-glyphosate (NNG) < 1 mg/kg Formic acid < 4 g/kg Triethylamine < 2 g/kg
Location of the (proposed) reference specification (for significant impurities)	RAR Volume 4 (2021)
Molecular formula	$C_6H_{17}N_2O_5P$
Molar mass	228.18 g/mol
Structural formula	

Chemical name (IUPAC)	N-(phosphonomethyl)glycine monoammonium salt
Chemical name (CA)	N-(phosphonomethyl)glycine ammonium salt
CIPAC No	284.007
CAS No	114370-14-8
EC No (EINECS or ELINCS)	601-309-9
FAO Specification (including year of publication)	No FAO specification
Minimum purity of the active substance as manufactured	950 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Formaldehyde < 1 g/kg N-Nitroso-glyphosate (NNG) < 1 mg/kg Formic acid < 4 g/kg Triethylamine < 2 g/kg
Location of the (proposed) reference specification (for significant impurities)	RAR Volume 4 (2021)
Molecular formula	$C_3H_{11}N_2O_5P$

Molar mass	186.10 g/mol
Structural formula	

Chemical name (IUPAC)	N-(phosphonomethyl)glycine monopotassium salt
Chemical name (CA)	N-(phosphonomethyl)glycine potassium salt
CIPAC No	284.019
CAS No	39600-42-5
EC No (EINECS or ELINCS)	687-795-3
FAO Specification (including year of publication)	No FAO specification
Minimum purity of the active substance as manufactured	950 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Formaldehyde < 1 g/kg N-Nitroso-glyphosate (NNG) < 1 mg/kg Formic acid < 4 g/kg Triethylamine < 2 g/kg
Location of the (proposed) reference specification (for significant impurities)	RAR Volume 4 (2021)
Molecular formula	$C_3H_7KNO_5P$
Molar mass	207.19 g/mol
Structural formula	

Chemical name (IUPAC)	N-(phosphonomethyl)glycine dimethylammonium salt
Chemical name (CA)	N-(phosphonomethyl)glycine dimethylammonium salt
CIPAC No	284.102
CAS No	1071-83-6
EC No (EINECS or ELINCS)	696-134-8
FAO Specification (including year of publication)	No FAO specification
Minimum purity of the active substance as manufactured	950 g/kg

Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Formaldehyde < 1 g/kg N-Nitroso-glyphosate (NNG) < 1 mg/kg Formic acid < 4 g/kg Triethylamine < 2 g/kg
Location of the (proposed) reference specification (for significant impurities)	RAR Volume 4 (2021)
Molecular formula	$C_5H_{15}N_2O_5P$
Molar mass	214.15 g/mol
Structural formula	

Physical and chemical properties (Regulation (EU) N° 283/2013, Annex Part A, point 2)

Melting point (state purity)	**Glyphosate acid**: 189.5 °C (99.9 %) **Glyphosate IPA salt**: 143 – 164 °C (DSD method); 110 – 113 °C (OECD 102) **Glyphosate NH4 salt:** Decomposed at temperature >190 °C without melting **Glyphosate K salt**: 219.8 °C **Glyphosate DMA salt**: Pure glyphosate DMA salt can technically not be isolated
Boiling point (state purity)	Not applicable because glyphosate and its salts decompose during melting
Temperature of decomposition (state purity)	**Glyphosate acid** : 200 °C (99.6 %) **Glyphosate IPA salt**: > 282 °C (98.1%) **Glyphosate NH4 salt** : > 190 °C (97.9%) **Glyphosate K salt**: 223.9 °C (98.4%) **Glyphosate DMA salt**: >280 °C (62.1%)
Appearance (state purity)	**Glyphosate acid**: White solid (99.6 %) **Glyphosate IPA salt**: White powder (96.9 %) **Glyphosate NH4 salt**: White crystalline powder (97.9 %) **Glyphosate K salt**: White crystalline solid (98.4 %) **Glyphosate DMA salt**: Yellow liquid (62.1 %)

Vapour pressure (state temperature, state purity)	**Glyphosate acid**: 1.31×10^{-5} Pa at 25 °C (98.6 %) **Glyphosate IPA salt**: At 98 % 1.3×10^{-6} Pa (25 °C); 0.7×10^{-6} Pa (20 °C) **Glyphosate NH4 salt**: 9.0×10^{-6} Pa (25 °C) (97.9 %) **Glyphosate K salt**: $< 5.8 \times 10^{-3}$ Pa (25 °C) at 91.8 %; $< 1.5 \times 10^{-3}$ Pa (20 °C) at 91.8% **Glyphosate DMA salt**: Pure glyphosate DMA salt can technically not be isolated.
Henry's law constant (state temperature)	**Glyphosate acid** : $< 2.21 \times 10^{-8}$ Pa m^3 mol^{-1} (25 °C) **Glyphosate IPA salt:** 4.6×10^{-10} Pa·m^3·mol^{-1} (25 °C) **Glyphosate NH4 salt**: $< 8.6 \times 10^{-9}$ Pa·m^3·mol^{-1} **Glyphosate K salt:** 1.31×10^{-6} Pa·m^3·mol^{-1} (25 °C) ; $< 3.38 \times 10^{-7}$ Pa·m^3·mol^{-1} (20 °C) **Glyphosate DMA salt:** /

Solubility in water (state temperature, state purity and pH)	**Glyphosate acid**: Solubility at 20 °C (99.9 %) > 100 g/L (pH 5) > 100 g/L (pH 7) 171 g/L (pH 9) 10.5 g/L under un-buffered water (pH 1.90 – 1.98) (99.5 %) **Glyphosate IPA salt**: 1050 g/L at 20 °C (pH 4.3, pure water) 627 g/L (pH 3.9, acidic medium) 990 g/L (pH 6.2, alkaline medium) **Glyphosate NH4 salt**: 212 g/L at 20 °C (pH 5) 195 g/L at 20 °C (pH 7) 190 g/L at 20 °C (pH 9) **Glyphosate K salt:** 923.3 g/L at 20 °C (pH 4) 918.7 g/L at 20 °C (pH 7) 902.5 g/L at 20 °C (pH 9) **Glyphosate DMA salt:** Pure glyphosate DMA salt can technically not be isolated.

Solubility in organic solvents (state temperature, state purity)	**Glyphosate acid:** Solubility at 20 °C (96.9 %) acetone < 0.6 mg/L 1,2-dichloroethane < 0.6 mg/L ethyl acetate < 0.6 mg/L heptane < 0.6 mg/L methanol 10 mg/L octan-1-ol < 0.6 mg/L xylenes < 0.6 mg/L acetonitrile 0.8 mg/L **Glyphosate IPA salt**: at 23°C Methanol: 19.86 g/L Hexane: < 0.05 g/L Toluene: < 0.05 g/L Dichloromethane: < 0.05 g/L Acetone: < 0.05 g/L Ethyl acetate: < 0.05 g/L **Glyphosate NH4 salt:** at 20°C Acetone: 2.3 mg/L Ethylene dichloride: <1.3 mg/L Methanol: 159 mg/L Heptane: <1.3 mg/L Ethyl acetate: < 1.3 mg/L Xylene: < 1.3 mg/L **Glyphosate K salt:** at 20°C Acetone: < 10.2 mg/L Dichloromethane: < 10.2 mg/L Methanol: 217 mg/L Heptane: < 10.2 mg/L Ethyl acetate: < 10.2 mg/L Toluene: < 10.2 mg/L **Glyphosate DMA salt:** Pure glyphosate DMA salt can technically not be isolated.

Surface tension (state concentration and temperature, state purity)	**Glyphosate acid:** 72.2 mN/m at 20 °C (90 % saturated solution) (96.9 %) **Glyphosate IPA salt:** 72.8 mN/m at 20 °C (96.7 %) **Glyphosate NH4 salt*:*** 1 g/L in distilled water: 71.7 mN/m; 0.502 g/L in distilled water: 71.7 mN/m (97.9 %) **Glyphosate K salt:** 72.7 mN/m at 1 g/L in distilled water (91.8 %) **Glyphosate DMA salt*:*** 74.5 mN/m at 25 °C (undiluted); 73.0 mN/m at 40 °C (undiluted) (60.8 %)
Partition coefficient (state temperature, pH and purity)	**Glyphosate acid:** Log Pow = -5.39 at 25 °C (at pH buffers at 5) Log Pow = -6.28 at 25 °C (at pH buffers at 7) Log Pow = -5.83 at 25 °C (at pH buffers at 9) **Glyphosate IPA salt:** Log Pow = -4.16 at 20 °C (at pH buffers 4.3 – 6.2) **Glyphosate NH4 salt:** Log Pow = < -3.7 at 20 °C (at pH 3.16) **Glyphosate K salt:** Log Pow = < -0.7 at 20 °C, (at pH 3.16) (shake flask method) **Glyphosate DMA salt:** Pure glyphosate DMA salt can technically not be isolated

Dissociation constant (state purity)	**Glyphosate acid** pKa_1 = 2.34 (99 %) pKa_1 = 5.73 (99 %) **Glyphosate IPA salt:** pKa1 = 2.18 ± 0.02 (98.1 %) pKa2 = 5.77 ± 0.03 (98.1 %) **Glyphosate NH4 salt:** pKa = 5.52 ± 0.022 (97.51 %) **Glyphosate K salt:** pKa = 5.73 ± 0.080 (91.8 %) **Glyphosate DMA salt:** Pure glyphosate DMA salt can technically not be isolated.
UV/VIS absorption (max.) incl. ε (state purity, pH)	**Glyphosate acid** Aqueous solution (97.7 %): ε at 200 (nm): 122 L mol^{-1} cm^{-1} (pH 7.19) 760 L mol^{-1} cm^{-1} (pH 1.99) 712 L mol^{-1} cm^{-1} (pH 10.29) ε at 290 nm: < 10 L mol^{-1} cm^{-1} **Glyphosate IPA salt:** ε at 200 (nm): 279 L mol^{-1} cm^{-1} (pH 7.19) 233 L mol^{-1} cm^{-1} (pH 1.99) 534 L mol^{-1} cm^{-1} (pH 10.29) **Glyphosate NH4 salt**: No maximum absorption in the range 220 - 800 nm **Glyphosate K salt:** No maximum in the range 200 - 900 nm at pH 1, pH 5 and pH 13 **Glyphosate DMA salt:** Pure glyphosate DMA salt can technically not be isolated.

Flammability (state purity)	Glyphosate acid is not flammable substance (97.7 %) Glyphosate IPA salt is not flammable substance (96.7 %) Glyphosate NH4 salt is not flammable substance (97.9 %) Glyphosate K salt is not flammable substance (91.8 %)
Explosive properties (state purity)	Glyphosate acid is not explosive Glyphosate IPA salt is not explosive (96.7%) Glyphosate NH4 salt is not explosive (97.9 %) Glyphosate K salt is not explosive (91.8 %) Glyphosate DMA salt is not explosive (60.8%)
Oxidising properties (state purity)	Glyphosate technical material is not an oxidising substance (96.9 %) Glyphosate IPA salt is not an oxidising substance (96.7 %) Glyphosate NH4 salt is not an oxidising substance (97.9 %) Glyphosate K salt is not an oxidising substance (91.8 %) Glyphosate DMA salt is not an oxidising substance (60.8 %)

Summary of representative uses evaluated, for which all risk assessments needed to be completed (*glyphosate as isopropylammonium salt*)
(Regulation (EU) N° 284/2013, Annex Part A, points 3, 4)

PPP (product name/code) **active substance 1** **safener** **synergist**	**MON 52276** **glyphosate as isopropylammonium salt** **-** **-**	**Formulation type:** **Conc. of as 1:** expressed as glyphosate acid, which corresponds to 360 g/L for MON 52276 **Conc. of safener:** **Conc. of synergist:**	**SL** **360 g/L (486 g/L isopropylammonium salt) -** **-** **-**
Applicant: **Zone(s):**	**GRG** **central, southern and northern**	**professional use** **non-professional use**	☒ ☐
Verified by MS:	**y/n**		

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G o r I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
PRE-SOWING, PRE-PLANTING, PRE-EMERGENCE												
1a	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual weeds, emerged perennial and biennial weeds BBCH > 13	Tractor mounted broadcast spray	Pre-sowing, Pre-planting, Pre-emergence of the crop	a) 1 b) 1	a) 4 L/ha b) 4 L/ha	a) 1.44 kg as/ha b) 1.44 kg as//ha	100 – 400	N/A	Also applicable to renovation / change of land use applications. Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 1.44 kg as/ha glyphosate in any 12 months period.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1b	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual weeds, emerged perennial and biennial weeds (BBCH 13 – 21)	Tractor mounted broadcast spray	Pre-sowing, Pre-planting, Pre-emergence of the crop	a) 1 b) 1	a) 3 L/ha b) 3 L/ha	a) 1.08 kg as/ha b) 1.08 kg as//ha	100 – 400	N/A	Also applicable to renovation / change of land use applications. Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 1.08 kg as/ha glyphosate in any 12 months period.
1c	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual weeds	Tractor mounted broadcast spray	Pre-sowing, Pre-planting, Pre-emergence of the crop	a) 1 b) 1	a) 2 L/ha b) 2 L/ha	a) 0.72 kg as/ha b) 0.72 kg as/ha	100 – 400	N/A	Also applicable to renovation / change of land use applications. Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 0.72 kg as/ha glyphosate in any 12 months period.
POST-HARVEST, PRE-SOWING, PRE-PLANTING												
2a	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual, perennial and biennial weeds	Tractor mounted broadcast spray	Post-harvest, pre-sowing, pre-planting	a) 1 – 2 (28 days) b) 1 – 2 (28 days)	a) 3 – 4 L/ha b) 6 L/ha	a) 1.08 – 1.44 kg as/ha b) 2.16 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of remaining crop / stubble and for control of actively growing weeds and mature annual weeds with hardened-off surface Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 2.16 kg as/ha glyphosate in any 12 months period.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G o r I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
2b	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual, perennial and biennial weeds	Tractor mounted broadcast spray	Post-harvest, pre-sowing, pre-planting	a) 1 – 3 (28 days) b) 1 – 3 (28 days)	a) 2 – 3 L/ha b) 6 L/ha	a) 0.72 – 1.08 kg as/ha b) 2.16 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of remaining crop / stubble and for control of actively growing weeds. Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 2.16 kg as/ha glyphosate in any 12 months period.
2c	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Emerged annual weeds	Tractor mounted broadcast spray	Post-harvest, pre-sowing, pre-planting	a) 1 – 3 (28 days) b) 1 – 3 (28 days)	a) 2 L/ha b) 6 L/ha	a) 0.72 kg as/ha b) 2.16 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of remaining crop / stubble and for control of actively growing annual weeds Application to 100 % of the field. Use 75 % drift reducing nozzles. Maximum application rate of 2.16 kg as/ha glyphosate in any 12 months period.
3a	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Cereal volunteers	Tractor mounted broadcast spray	Post-harvest, pre-sowing, pre-planting	a) 1 b) 1	a) 1.5 L/ha b) 1.5 L/ha	a) 0.54 kg as/ha b) 0.54 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of cereal volunteers. Maximum application rate of 0.54 kg as/ha glyphosate in any 12 months period.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
3b	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Cereal volunteers	Tractor mounted broadcast spray	Post-harvest, pre-sowing, pre-planting	a) 1 b) 1	a) 1.5 L/ha b) 1.5 L/ha	a) 0.54 kg as/ha b) 0.54 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of cereal volunteers once every three years. Maximum application rate of 0.54 kg as/ha glyphosate in any 36 months period.
POST-EMERGENCE OF WEEDS												
4a	EU	Orchard crops (citrus, stone and pome fruits, kiwi, tree nuts, banana, and table olives)	F	Emerged annual, biennial and perennial weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 2 (28 days) b) 1 – 2 (28 days)	a) 3 – 4 L/ha b) 8 L/ha	a) 1.08 – 1.44 kg as/ha b) 2.88 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.88 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the trees or as spot treatments. The treated area represents not more than 50 % of the total orchard area. The application rate with reference to the total orchard surface area is not more than 50 % of the stated dose rate.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
4b	EU	Orchard crops (citrus, stone and pome fruits, kiwi, tree nuts, banana, and table olives)	F	Emerged annual, biennial and perennial weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 3 (28 days) b) 1 – 3 (28 days))	a) 2 – 3 L/ha b) 8 L/ha	a) 0.72 – 1.08 kg as/ha b) 2.88 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.88 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the trees or as spot treatments. The treated area represents not more than 50 % of the total orchard area. The application rate with reference to the total orchard surface area is not more than 50 % of the stated dose rate.
4c	EU	Orchard crops (citrus, stone and pome fruits, kiwi, tree nuts, banana, and table olives)	F	Emerged annual weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 3 (28 days) b) 1 – 3 (28 days)	a) 2 L/ha b) 6 L/ha	a) 0.72 kg as/ha b) 2.16 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.16 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the trees or as spot treatments. The treated area represents not more than 50 % of the total orchard area. The application rate with reference to the total orchard surface area is not more than 50 % of the stated dose rate.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
5a	EU	Vines (table and wine grape, leaves not intended for human consumption)	F	Emerged annual, biennial and perennial weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 2 (28 days) b) 1 – 2 (28 days)	a) 3 – 4 L/ha b) 8 L/ha	a) 1.08 – 1.44 kg as/ha b) 2.88 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.88 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the vine stock or as spot treatments. The treated area represents not more than 50 % of the total vineyard area. The application rate with reference to the total vineyard surface area is not more than 50 % of the stated dose rate.
5b	EU	Vines (table and wine grape, leaves not intended for human consumption)	F	Emerged annual, biennial and perennial weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 3 (28 days) b) 1 – 3 (28 days)	a) 2 – 3 L/ha b) 8 L/ha	a) 0.72 – 1.08 kg as/ha b) 2.88 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.88 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the vine stock or as spot treatments. The treated area represents not more than 50 % of the total vineyard area. The application rate with reference to the total vineyard surface area is not more than 50 % of the stated dose rate.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
5c	EU	Vines (table and wine grape, leaves not intended for human consumption)	F	Emerged annual weeds	Ground directed, shielded spray, band application	Post-emergence of weeds	a) 1 – 3 (28 days) b) 1 – 3 (28 days)	a) 2 L/ha b) 6 L/ha	a) 0.72 kg as/ha b) 2.16 kg as/ha	100 – 400	7	Avoid crop contamination during treatment. Maximum application rate of 2.16 kg as/ha treated area glyphosate in any 12 months period. Band application in the rows below the vine stock or as spot treatments. The treated area represents not more than 50 % of the total vineyard area. The application rate with reference to the total vineyard surface area is not more than 50 % of the stated dose rate.
6a	EU	Vegetables (Root and tuber vegetables Bulb vegetables, Fruiting vegetables Legume vegetables Leafy vegetables)	F	Emerged annual, biennial and perennial weeds	Inter-row application: ground directed, shielded spray	Crop BBCH < 20	a) 1 b) 1	a) 3 L/ha b) 3 L/ha	a) 1.08 kg as/ha b) 1.08 kg as/ha	100 – 400	60	Avoid crop contamination during treatment. Maximum application rate of 1.08 kg as/ha glyphosate in any 12 months period. Applications are performed between the crop rows. The rate refers to the treated area only, which represents not more than 50 % of the total area. The application rate with reference to the total surface area is not more than 50 % of the stated dose rate

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G o r I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
6b	EU	Vegetables (Root and tuber vegetables Bulb vegetables, Fruiting vegetables Legume vegetables Leafy vegetables)	F	Emerged annual weeds	Inter-row application: ground directed, shielded spray	Crop BBCH < 20	a) 1 b) 1	a) 2 L/ha b) 2 L/ha	a) 0.72 kg as/ha b) 0.72 kg as/ha	100 – 400	60	Avoid crop contamination during treatment. Maximum application rate of 0.72 kg as/ha glyphosate in any 12 months period. Applications are performed between the crop rows. The rate refers to the treated area only, which represents not more than 50 % of the total area. The application rate with reference to the total surface area is not more than 50 % of the stated dose rate
7a	EU	Railroad tracks	F	Emerged annual, biennial and perennial weeds	Ground directed, spray	Post-emergence of weeds	a) 2 (90 days) b) 2 (90 days)	a) 5 L/ha b) 10 L/ha	a) 1.8 kg as/ha b) 3.6 kg as/ha	100 – 400	N/A	Application by spray train Maximum application rate of 3.6 kg as/ha glyphosate in any 12 months period.
7b	EU	Railroad tracks	F	Emerged annual, biennial and perennial weeds	Ground directed, spray	Post-emergence of weeds	a) 1 b) 1	a) 5 L/ha b) 5 L/ha	a) 1.8 kg as/ha b) 1.8 kg as/ha	100 – 400	N/A	Application by spray train Maximum application rate of 1.8 kg as/ha glyphosate in any 12 months period.
8	EU	Invasive species in agricultural and non-agricultural areas	F	Giant hogweed (*Heracleum mantegazzianum*)	Spot treatment (shielded)	Post-emergence of invasive species	a) 1 b) 1	a) 5 L/ha b) 5 L/ha	a) 1.8 kg as/ha b) 1.8 kg as/ha	5 – 400	N/A	Maximum application rate of 1.8 kg as/ha glyphosate in any 12 months period.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
9	EU	Invasive species in agricultural and non-agricultural areas	F	Japanese knotweed (*Reynoutria japonica*)	Spot treatment (shielded), cut stem: spray application	Late summer, early fall	a) 1 b) 1	a) 5 L/ha b) 5 L/ha	a) 1.8 kg as/ha b) 1.8 kg as/ha	5 – 400	N/A	Maximum application rate of 1.8 kg as/ha glyphosate in any 12 months period.
10a	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Couch grass (*Elymus repens*)	Spot treatment (shielded)	Post-harvest, pre-sowing, pre-planting	a) 1 b) 1	a) 3 L/ha b) 3 L/ha	a) 1.08 kg as/ha b) 1.08 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of couch grass. Maximum application rate of 1.08 kg as/ha glyphosate in any 12 months period. The treated area represents not more than 20 % of the cropland.
10b	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Couch grass (*Elymus repens*)	Spot treatment (shielded)	Post-harvest, pre-sowing, pre-planting	a) 1 b) 1	a) 2 L/ha b) 2 L/ha	a) 0.72 kg as/ha b) 0.72 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of couch grass. Maximum application rate of 0.72 kg as/ha glyphosate in any 12 months period. The treated area represents not more than 20 % of the cropland.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F** **G** **o** **r** **I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**kg, L product/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g, kg as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
10c	EU	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet	F	Couch grass (*Elymus repens*)	Spot treatment (shielded)	Post-harvest, pre-sowing, pre-planting	a) 1 b) 1	a) 2 L/ha b) 2 L/ha	a) 0.72 kg as/ha b) 0.72 kg as/ha	100 – 400	N/A	Application to existing row cropland after harvest for removal of couch grass once every three years. Maximum application rate of 0.72 kg as/ha glyphosate in any 36 months period. The treated area represents not more than 20 % of the cropland.

Remarks table heading:

(a) e g wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(b) Catalogue of pesticide formulation types and international coding system CropLife International Technical Monograph n°2, 6th Edition Revised May 2008
(c) g/kg or g/l
(d) Select relevant
(e) Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1
(f) No authorization possible for uses where the line is highlighted in grey, Use should be crossed out when the notifier no longer supports this use

Remarks columns:

1 Numeration necessary to allow references
2 Use official codes/nomenclatures of EU Member States
3 For crops, the EU and Codex classifications (both) should be used; when relevant, the use situation should be described (e g fumigation of a structure)
4 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
5 Scientific names and EPPO-Codes of target pests/diseases/ weeds or, when relevant, the common names of the pest groups (e g biting and sucking insects, soil born insects, foliar fungi, weeds) and the developmental stages of the pests and pest groups at the moment of application must be named
6 Method, e g high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e g overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
7 Growth stage at first and last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
8 The maximum number of application possible under practical conditions of use must be provided
9 Minimum interval (in days) between applications of the same product
10 For specific uses other specifications might be possible, e g : g/m³ in case of fumigation of empty rooms
See also EPPO-Guideline PP 1/239 Dose expression for plant protection products
11 The dimension (g, kg) must be clearly specified (Maximum) dose of a s per treatment (usually g, kg or L product / ha)
12 If water volume range depends on application equipments (e g ULVA or LVA) it should be mentioned under "application: method/kind"
13 PHI - minimum pre-harvest interval
14 Remarks may include: Extent of use/economic importance/restrictions

Summary of additional intended uses for which MRL applications have been made, that in addition to the uses above, have also been considered in the consumer risk assessment
Regulation (EC) N° 1107/2009 Article 8.1(g))

Not applicable. Only an MRL for honey is applied for. This is not regarded an additional intended use.

Further information, Efficacy

Effectiveness (Regulation (EU) N° 284/2013, Annex Part A, point 6.2)

In terms of efficacy, the representative uses GAPs are supported

Adverse effects on field crops (Regulation (EU) N° 284/2013, Annex Part A, point 6.4)

In terms of adverse effects on field crops, the representative uses GAPs are supported

Observations on other undesirable or unintended side-effects (Regulation (EU) N° 284/2013, Annex Part A, point 6.5)

In terms of adverse effects on succeeding or adjacent crops, the representative uses GAPs are supported

Groundwater metabolites: Screening for biological activity (SANCO/221/2000-rev.10-final Step 3 a Stage 1)

	AMPA
Activity against target organism	No

Methods of Analysis

Analytical methods for the active substance (Regulation (EU) N° 283/2013, Annex Part A, point 4.1 and Regulation (EU) N° 284/2013, Annex Part A, point 5.2)

Technical a.s. (analytical technique)	HPLC-UV; HPLC-PDA
Impurities in technical a.s. (analytical technique)	HPLC-UV; LC-MS/MS; IC-UV; HPLC-colorimeter; Karl-Fisher
Plant protection product (analytical technique)	HPLC-UV

Analytical methods for residues (Regulation (EU) N° 283/2013, Annex Part A, point 4.2 & point 7.4.2)

Residue definitions for monitoring purposes

Food of plant origin		Non-tolerant crops: glyphosate Tolerant crops: sum of glyphosate, AMPA and N-acetyl-glyphosate, expressed as glyphosate
Food of animal origin		Sum of glyphosate, AMPA and N-acetyl-glyphosate, expressed as glyphosate
Soil		glyphosate and AMPA
Sediment		glyphosate and AMPA
Water	surface	glyphosate and AMPA
	drinking/ground	glyphosate and AMPA
Air		glyphosate
Body fluids and tissues		Fluids: Glyphosate and AMPA Tissues: Sum of glyphosate, AMPA and N-acetyl-glyphosate, expressed as glyphosate

Monitoring/Enforcement methods

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS LOQ 0.05 mg/kg for glyphosate and AMPA LOQ 0.025 mg/kg for *N*-acetylglyphosate Extraction efficiency-pending
Food/feed of animal origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS LOQ 0.025 mg/kg for glyphosate, AMPA and *N*-acetylglyphosate Extraction efficiency-pending
Honey (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS LOQ 0.025 mg/kg for glyphosate, and AMPA Extraction efficiency-pending
Soil (analytical technique and LOQ)	LC-MS/MS LOQ 0.05 mg/kg for glyphosate and AMPA

Water (analytical technique and LOQ)	LC-MS/MS LOQ 0.03 µg/L for glyphosate and AMPA
Air (analytical technique and LOQ)	GC-MS LOQ 5 µg/m^3 for glyphosate
Body fluids and tissues (analytical technique and LOQ)	Fluids: LC-MS/MS LOQ 0.01 mg/L for glyphosate and AMPA

Classification and labelling with regard to physical and chemical data (Regulation (EU) N° 283/2013, Annex Part A, point 10)

Substance	Glyphosate
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][1]:	No classification linked to physical and chemical properties of glyphosate
Peer review proposal [2] for harmonised classification according to Regulation (EC) No 1272/2008:	None

[1] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[2] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Impact on Human and Animal Health

Absorption, distribution, metabolism and excretion (toxicokinetics) (Regulation (EU) N° 283/2013, Annex Part A, point 5.1)

Rate and extent of oral absorption/systemic bioavailability	20% (based on various studies in rats, dose levels ranging between 1-1000 mg/kg bw) Absorption independent of dose and sex.
Toxicokinetics	<u>Glyphosate:</u> Cmax in plasma: 0.64-0.84 µg/ml at 72 mg/kg bw/day and 4.69-5.31 µg/ml at 385 mg/kg bw/day Tmax: 0.5 hour at 72 and 385 mg/kg bw/day; other studies 2-8 hours Plasma T1/2: 11 hours at 72 mg/kg bw/day and 13 hours at 385 mg/kg bw/day; other studies 6-12 h AUC: 8.3-10.4 µg/ml at 72 mg/kg bw/day and 44.7-57.0 µg/ml at 385 mg/kg bw/day <u>AMPA (after 14-day repeated administration of 385 mg/kg bw/d of glyphosate):</u> Cmax in plasma: 0.038-0.041 µg/ml Tmax: 0.5 hour Plasma T1/2: 7.0-7.5 hours AUC: 0.245-0.276 µg/ml
Distribution	Widely distributed *(*bone, kidney, to lesser extent in liver)
Potential for bioaccumulation	No evidence for accumulation
Rate and extent of excretion	Rapid and extensive (app. 90 % within 24 h), mainly via faeces (~ 20% in urine, remaining via faeces). Biliary excretion and exhalation negligible.
Metabolism in animals	Very limited metabolism with only biotransformation to AMPA accounting for up to 0.6% of the total excreted amount.
In vitro metabolism	Poorly metabolized (97% unmetabolized glyphosate). No unique human metabolite detected.
Toxicologically relevant compounds (animals and plants)	Glyphosate
Toxicologically relevant compounds (environment)	Glyphosate

Acute toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.2)

Rat LD_{50} oral	> 2000 mg/kg bw	
Rat LD_{50} dermal	> 2000 mg/kg bw	
Rat LC_{50} inhalation	> 5 mg/L	

Skin irritation	Non-irritating to skin	
Eye irritation	Serious eye damage	Cat. 1, H318
Skin sensitisation	Negative (M&K test, LLNA, Buehler) (glyphosate acid) Negative (M&K test) (IPA salt)	
Phototoxicity	Not required	

Short-term toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.3)

Target organ / critical effect	Rat: soft stool, diarrhoea, reduction in body weight gain and food consumption, liver effects (increased weight, changes in blood chemistry), caecum (distention and increased weight), salivary gland (cellular alterations) Mice: reduction in body weight gain and food consumption, liver effects (changes in blood chemistry), caecum (distension), increased incidence of cystitis in the urinary bladder (high dose males only) Dog: loose stool, reduction in body weight gain and food consumption, liver (changes in blood chemistry), kidney (increased weight)	
Relevant oral NOAEL	90-day, rat: 30 mg/kg bw per day 90-day, mice: 600 mg/kg bw per day (*provisional*) 90-day, dog: 68 mg/kg bw per day	
Relevant dermal NOAEL	21-day, rat: 1000 mg/kg bw per day (systemic), LOAEL for local effects of 1000 mg/kg bw/day (mild skin irritation; observed at the only dose tested), 28-day, rabbit: 2000 mg/kg bw per day (systemic); 1000 mg/kg bw per day (local effects)	
Relevant inhalation NOAEL	No data - not required	

Genotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.4)

In vitro studies	***In vitro* bacterial gene mutation assays** Negative ***In vitro* gene mutation assay in mammalian cells** Negative	

	***In vitro* clastogenicity and aneugenicity assay** Negative ***In vitro* studies from public literature** Negative and positive outcomes. However, due to methodological shortcomings, the toxicological relevance of the reported findings is unclear.	
In vivo studies	***In vivo* studies in somatic cells** Overall negative ***In vivo* studies from public literature** Negative and positive outcomes. However, due to methodological shortcomings, the toxicological relevance of the reported findings is unclear. **Human data** Although not completely negative, the available studies do not provide sufficiently robust evidence of glyphosate genotoxicity in humans.	
Photomutagenicity	Not required	
Potential for genotoxicity	Preliminary conclusion: not genotoxic	

Long-term toxicity and carcinogenicity (Regulation (EU) N°283/2013, Annex Part A, point 5.5)

Long-term effects (target organ/critical effect)	Rat: liver (increased ALP and weight), salivary gland (increased weight and cellular alterations), stomach (inflammation and hyperplasia of squamous mucosa), caecum (distention and increased weight), eye (cataracts) Mouse: Reduced body weight, heart (degenerative changes), liver (hepatocyte hypertrophy and necrosis), kidney (chronic interstitial nephritis)	
Relevant long-term NOAEL	2-year, rat: 10 mg/kg bw per day 18-month, mouse: 150 mg/kg bw per day (overall NOAEL)	
Carcinogenicity (target organ, tumour type)	Not carcinogenic in rats and mice; Overall inconclusive for a causal or clear associative relationship between glyphosate and cancer in human studies; classification and labelling not required	
Relevant NOAEL for carcinogenicity	n.a.	

Reproductive toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.6)

Reproduction toxicity

Reproduction target / critical effect	Adult: gastrointestinal disturbances (soft stool, distension of caecum), reduced bw, organ weight changes (increased liver and kidney weights), effects on salivary gland (histopathological changes) Reproduction and fertility: reduced homogenisation resistant spermatids (in *Cauda epididymidis*) in F0 males at limit dose (1000 mg/kg bw/day) but no evidence for impairment of fertility and reproductive performance, lower fertility indices in F1 females at high dose level (above 2000 mg/kg bw/day) (one study) Offspring: reduced bw, delayed preputial separation in F1 generation at limit dose (1000 mg/kg bw/day) (one study), distension of caecum at high dose level (above 2000 mg/kg bw/day) (one study)	
Relevant parental NOAEL	66 mg/kg bw per day	
Relevant reproductive NOAEL	351 mg/kg bw per day	
Relevant offspring NOAEL	293 mg/kg bw per day	

Developmental toxicity

Developmental target / critical effect	Rat: Maternal toxicity: loose faeces in 20/22 dams Developmental toxicity: skeletal variations at 1000 mg/kg bw/d Rabbit: Maternal toxicity: reduced body weight gain (24-29%, not stat sign) Developmental toxicity: increased post-implantation loss (21% compared to 5.7% in controls) Cardiac malformations (11 foetuses compared to 2 in controls)	
Relevant maternal NOAEL	Rat: 300 mg/kg bw per day Rabbit: 50 mg/kg bw per day	
Relevant developmental NOAEL	Rat: 300 mg/kg bw per day Rabbit: 150 mg/kg bw per day	

Neurotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.7)

Acute neurotoxicity	No sign of neurotoxicity Critical effect: mortality, clinical signs NOAEL systemic toxicity = 1000 mg/kg bw	
Repeated neurotoxicity	No sign of neurotoxicity Critical effect: reduced body weight and food consumption NOAEL systemic toxicity = 395 mg/kg bw/day	
Additional studies (e.g. delayed neurotoxicity, developmental neurotoxicity)	Acute delayed neurotoxicity: No adverse effects up to highest dose of 2000 mg/kg bw	

Other toxicological studies (Regulation (EU) N° 283/2013, Annex Part A, point 5.8)

Supplementary studies on the active substance	<u>Immunotoxicity:</u> No indication of immunotoxic potential. NOAEL = 1448 mg/kg bw/day, the highest dose tested.

Endocrine disrupting properties	Level 1 studies: QSAR analysis: Negative Level 2 guideline *in vitro* studies: *In vitro* AR binding assay: Negative *In vitro* ER transactivation assay: Negative, but study not reliable. *In vitro* ER binding assay: Negative *In vitro* aromatase inhibition assay: Negative *In vitro* steroidogenesis: Negative Level 2 non-guideline *in vitro* studies: - Glyphosate decreased cell proliferation, cell viability, oestrogen production and ferric reducing capacity and increased progesterone and NO production in granulosa cells. Glyphosate significantly decreased the viability of adipose stromal cells and inhibited their adipogenic differentiation (only single concentration tested). - No effect on Sertoli cell viability, but an increase in cytoplasmic lipid droplets was observed at very high concentrations. - Activation of ERα but only at very high concentrations. - No effect on ERβ. - Inhibition of aromatase activity but only at very high concentrations. Level 3 studies: Uterotrophic assay: Negative Hershberger assay: Negative Male pubertal assay: Negative Female pubertal assay: Equivocal due to decrease in females regularly cycling (based on limited number of animals) and non-significant increase in age at first oestrus.

Studies performed on metabolites or impurities	AMPA Oral LD_{50} > 5000 mg/kg bw/day Dermal LD_{50} > 2000 mg/kg bw/day AMPA did not show a sensitising potential. Negative in *in vitro* bacterial gene mutation assay, negative in *in vitro* mammalian gene mutation assay, negative in *in vitro and in vivo* micronucleus assay. 28-day rat (NOAEL): 100 mg/kg bw/day based on decreased body weight and increased kidney weight at 350 mg/kg bw/day. 90-day rat: First study: NOAEL ≥ 1000 mg/kg bw/day based on no adverse effects at the highest dose tested. Second study: NOAEL of 400 mg/kg bw/day based on increased urothelial hyperplasia of the urinary bladder at 1200 mg/kg bw/day. 90-day dog (NOAEL): ≥ 263 mg/kg bw/day based on no adverse effects at the highest dose tested Rat developmental toxicity First study: Maternal and developmental NOAEL: 1000 mg/kg bw/day, the highest dose tested Second study: Maternal NOAEL: 150 mg/kg bw/day based on increased mucoid faeces, soft stool and hair loss at 400 mg/kg bw/day and above and decreased body weight gain and food consumption at 1000 mg/kg bw/day. Developmental NOAEL: 400 mg/kg bw/day based on a reduction in foetal weight at 1000 mg/kg bw/day. It is concluded that AMPA is of similar toxicity as glyphosate and its reference values can be applied.

N-acetyl AMPA Oral LD_{50} > 5000 mg/kg bw/day Negative bacterial gene mutation study, negative *in vitro* chromosomal aberration study, negative *in vitro* mammalian genotoxicity study and a negative *in vivo* micronucleus study. However, as bone marrow exposure is not proven in the latter study, aneugenicity was not sufficiently addressed and therefore no conclusion can be drawn on genotoxicity. 90-day rat (NOAEL): 374 and 455 mg/kg bw/day in males and females, respectively. Based on abnormal excreta in both sexes and decreased body weight gain in males at 1163 and 1400 mg/kg bw/day in males and females, respectively. Due to the data gap concerning genotoxicity, no conclusion is made regarding reference values.
N-acetyl glyphosate Oral LD_{50} > 5000 mg/kg bw/day Negative bacterial gene mutation study, negative *in vitro* chromosome aberration study, negative *in vitro* mammalian gene mutation study and a negative *in vivo* micronucleus study. However, as bone marrow exposure is not proven in the latter study, aneugenicity was not sufficiently addressed and therefore no conclusion can be drawn on genotoxicity. 90-day rat (NOAEL): 283 mg/kg bw/day based on decreased body weight gain in males at 1157 mg/kg bw/day. Due to the data gap concerning genotoxicity, no conclusion is made regarding reference values.

Medical data (Regulation (EU) N° 283/2013, Annex Part A, point 5.9)

No critical health effects reported from occupational health surveillance; no convincing evidence of carcinogenicity, neurotoxicity or effects on fertility and development in epidemiological studies; poisoning incidents after accidental or voluntary (suicidal) oral intake of large amounts of glyphosate-based herbicides; transient eye irritation as most frequent sign in operators following accidental exposure.

Summary[3] (Regulation (EU) N°1107/2009, Annex II, point 3.1 and 3.6)	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.1	2-year rat study	100
Acute Reference Dose (ARfD)	1.5	Developmental toxicity study in rabbits	100
Acceptable Operator Exposure Level (AOEL)	0.03	90-day rat study	2 (for LOAEL) x 100 x 5 (correction OA) = 1000*
Acute Acceptable Operator Exposure Level (AAOEL)	0.3	Developmental toxicity study in rabbits	100 x 5 (correction for OA) = 500*

* Including correction for limited oral absorption/bioavailability (20%).

Dermal absorption (Regulation (EU) N° 284/2013, Annex Part A, point 7.3)

Representative formulation (MON 52276, SL formulation, 360 g/L)	Concentrate: 0.096% Spray dilution 1:12.5 (28.8 g/L): 0.23% Spray dilution 1:150 (2.4 g/L): 0.68% *In vitro* human study with representative formulation.

Exposure scenarios (Regulation (EU) N° 284/2013, Annex Part A, point 7.2)

Operators	Use: **Pre-emergence of crops** (bare soil), tractor mounted equipment, application rate 1.44 kg a.s./ha Exposure estimates: % of AOEL EFSA model:

[3] If available include also reference values for metabolites

Without PPE: 12.7 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 5.22 %
Use: **Vegetables** (including root & tuber vegetables, bulb vegetables, fruiting vegetables, brassica, leafy vegetables, stem vegetables, sugar beet), tractor mounted equipment, application **rate 1.44 kg a.s./ha** Exposure estimates: % of AOEL EFSA model: Without PPE: 12.6 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 5.22 % **rate 2 x 1.08 kg a.s./ha** Exposure estimates: % of AOEL EFSA model: Without PPE: 10.0 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 4.22 %
Use: **Orchard crops** (including stone and pome fruits, kiwi, tree nuts, banana, and table olives, citrus) and **vines, vehicle-mounted** equipment, application rate 2 x 1.44 kg a.s./ha Exposure estimates: % of AOEL EFSA model: Without PPE: 12.7% Exposure estimates: % of AAOEL EFSA model: Without PPE: 3.10 %
Use: **Orchard crops** (including stone and pome fruits, kiwi, tree nuts, banana, and table olives, citrus) and **vines, manual hand-held** equipment, application rate 2 x 1.44 kg a.s./ha Exposure estimates: % of AOEL EFSA model: Without PPE: 22.1% Exposure estimates: % of AAOEL EFSA model: Without PPE: 10.81 %
Use: **Orchard crops** (including stone and pome fruits, kiwi, tree nuts, banana, and table olives, citrus) and **vines, manual knapsack**, application

	rate 2 x 1.44 kg a.s./ha Exposure estimates: % of AOEL EFSA model: Without PPE: 7.3 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 2.95 %
	Use: **Railroad tracks** (bare soil), application by spray train, application rate 2 x 1.8 kg a.s./ha Exposure estimates: % of AOEL EFSA model: Without PPE: 15.2 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 6.15 %
	Use: **Invasive species in agricultural and non-agricultural areas**, manual knapsack, application rate 1.8 kg a.s./ha Exposure estimates: % of AOEL EFSA model: Without PPE: 8.8 % Exposure estimates: % of AAOEL EFSA model: Without PPE: 3.54 %
Workers	Use: **Pre-emergence of crops** (bare soil) Not relevant since re-entry is not considered necessary shortly after spraying.
	Use: **Vegetables rate 1.44 kg a.s./ha** EFSA model: Without PPE: 32.64 % Use: **Vegetables rate 2 x 1.08 kg a.s./ha** EFSA model: Without PPE: 37.30 %
	Use: **Orchard crops** EFSA model: Hand harvesting scenario, without PPE: 89.5 % Inspection 8 h scenario, without PPE: 27.84 %
	Use: **Vines** EFSA model: Hand harvesting scenario, without PPE: 200.9 Inspection 8 h scenario, without PPE: 27.84 %

	Use: **Railroad tracks** Not relevant since re-entry is not considered necessary shortly after spraying.
	Use: **Invasive species in non-agricultural areas** EFSA model: Without PPE: 40.8 %
	Use: **Invasive species in agricultural areas** EFSA model: Without PPE: 5.71%
Bystanders and residents	Use: **Pre-emergence of crops** EFSA model: Resident: 4.44 % and 14.51 % for adult and child respectively Bystander: 0.58 % for adult (spray drift)
	Use: **Vegetables rate 1.44 kg a.s./ha** EFSA model: Resident: 4.44 % and 14.51 % for adult and child respectively Bystander: 0.58 % for adult (spray drift) Use: **Vegetables 2 x 1.08 kg a.s./ha** EFSA model: Resident: 4.54 % and 13.86 % for adult and child respectively Bystander: 0.43 % for adult (spray drift)
	Use: **Orchard crops** EFSA model: Resident: 6.70 % and 22.36 % for adult and child respectively Bystander: 0.58 % for adult (spray drift)
	Use: **Vines** EFSA model: Resident: 5.87 % and 17.68 % for adult and child respectively Bystander: 0.58 % for adult (spray drift)
	Use: **Railroad tracks** EFSA model: Resident: 5.76 % and 18.08 % for adult and child respectively Bystander: 0.72 % for adult (spray drift)

Use: **Invasive species in non-agricultural areas** (golf course, turf or other sports lawns) EFSA model: Resident: 28.28 % and 146.88 % for adult and child respectively Recreational: 4.96 % and 28.01 % for adult and child respectively Bystander: 14.49 % for adult (spray drift)
Use: **Invasive species in agricultural areas** EFSA model: Resident: 30.71% and 151.05% for adult and child respectively Bystander: 14.49 % for adult (spray drift)

Classification with regard to toxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

Substance :	glyphosate
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][4] :	Danger GHS05 (corrosion) Eye Damage 1 H318 - Causes serious eye damage
Peer review proposal [5] for harmonised classification according to Regulation (EC) No 1272/2008:	Danger GHS05 (corrosion) Eye Damage 1 H318 - Causes serious eye damage

[4] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[5] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Residues in or on treated products food and feed

Metabolism studies, methods of analysis and residue definitions in plants

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
Conventional crops	Fruit crops	Citrus (calamondin citrus); supportive only	Soil application at 2.24 kg/ha	4 months (119)	Glyphosate or AMPA
			Hydroponic treatment at 10 mg/kg hydroponic solution	7, 14	Glyphosate or AMPA
			Foliar application, dropping on leaves, 4 mg	7, 14, 21, 28, 42, 56	Glyphosate
		Citrus (lemon)	Soil application at 3.9 kg/ha (expressed in glyphosate equiv.)	3, 2 months, 4 months	Glyphosate trimesium salt
		Tree nuts (walnut, almond, and pecan); supportive only	Soil application at 5.07 kg/ha for pecan and walnut, and at 2.43 kg/ha for almonds	113	Glyphosate
			Foliar application at 100 µg per leaf surface	14 (walnut), 35 (walnut, almond, and pecan)	Glyphosate
		Apple; supportive only	Soil application at 3.36 kg/ha or AMPA at 1.68 kg/ha	42, 84	Glyphosate or AMPA
			Trunk application at 92.4 µg/tree	8, 42	Glyphosate
			Foliar application at 10 µg/leaf or 10.7 mg/leaf	7, 21, 28, 49, 70	Glyphosate
		Grapes	Soil application at 8.1 (PMG-label) and 7.8 kg/ha (TMS-label) corresponding to 5.6 or 5.4 kg glyphosate equiv./ha, respectively	14, 365	Glyphosate trimesium salt
			Overspray on bunches at 14.3 mg per 10 bunches (PMG-label) and 13.2 mg per 10 bunches (TMS-label) corresponding to 9.9 mg and 9.1 mg expressed as glyphosate equivalents	14	Glyphosate trimesium salt
		Grapes	Soil application (drench) at 8.3 kg/ha (PMG-label) (corresponding to 5.7 kg glyphosate equiv./ha) or 7.1 kg/ha (TMS label)	7	Glyphosate trimesium salt

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
			(corresponding to 4.9 kg glyphosate equiv./ha)		
		Grapes; supportive only	Soil application at 3.36 kg/ha or AMPA at 1.68 kg/ha	42, 84	Glyphosate or AMPA
			Trunk application at 40 µg per tree (corresponding to 0.17 kg glyphosate/ha)	42, 84	Glyphosate
			Hydroponic treatment at 5, 10, 20 or 40 mg/kg	10, 21, 42	Glyphosate
			Foliar application at 20 µg per leaf (120 µg per plant)	7, 14, 28, 42, 56, 70	Glyphosate
	Root crops	Potato; not acceptable	Soil application at 23.8 mg per pot or AMPA at 23.4 mg per pot (application to bare soil)	9, 15, 25, 67, 121	Glyphosate or AMPA
			Soil application at 4.48 kg/ha planting of pre-grown potatoes (BBCH 09) (weeds treated with glyphosate and incorporated into soil to simulate ploughing)	9, 15, 25, 67, 121	Glyphosate
			Foliar application at 108 µg per plant at pre-bloom stage	1, 3, 14, 34	Glyphosate
		Sugar beets; supportive only	Soil application at 8.0 mg per pot	28, 49, 56	Glyphosate or AMPA
			Foliar application at 3.57 µg per plant and 0.89 µg per leaf	35	Glyphosate
	Cereals/grass	Wheat	5.64 kg/ha (corresponding to 3.89 kg glyphosate equiv./ha)	7	Glyphosate trimesium salt
		Barley, oat, sorghum, rice; supportive only	Soil application at 4.5 kg/ha	28, 42, 56	Glyphosate
			Hydroponic treatment at 0.183 mg/mL	7, 14, 20, 28	
		Wheat, maize; supportive only	Soil application at 4.5 kg/ha or AMPA at 1.7 kg/ha	28, 42, 56	Glyphosate or AMPA
			Sand culture experiment at 2.24 kg/ha	4, 10, 18	

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
			Hydroponic treatment at 3 mg/24 plants (maize) or 3 mg/72 plants (wheat)	6, 12, 20, 28	
		Pasture; supportive only	Soil application at 4.48 kg/ha	42, 84, 126, 168, 224	Glyphosate
			Foliar application at 1.68 kg/ha to quackgrass followed by incorporation in the soil after 1 week, and after 1 month sowing of fescue/alfalfa mixture	42, 84, 126, 168	
			Foliar application at 1.12 kg/ha	63, 105, 161	
			Pre-harvest application at 1.12 kg/ha	7	
	Pulses/oilseeds	Soybean	Soil drench at 8.4 kg/ha	31, 97	Glyphosate trimesium salt
		Soybean, cotton; supportive only	Soil application at 4.5 kg/ha or AMPA at 1.7 kg/ha	28, 42, 56	Glyphosate or AMPA
			Sand culture experiment at 2.24 kg/ha	4, 10, 18	Glyphosate
			Hydroponic treatment at 12 mg/24 plants or 50 mg/99 plants or 12 mg/24 plants (different label) or 12 mg/24 plants (different label) or mixture of $^{13}/^{14}$C-glyphosate at 50 mg/198 plants or 12 mg/24 plants for 6 days	6, 12, 20, 25, 26, 28, 42, 56	Glyphosate
	Miscellaneous	Coffee	Soil application at 4.5 kg/ha	28, 42, 56	Glyphosate or AMPA
			Stem treatment at 1.9 mg/plant	35	Glyphosate
			Foliar application at 0.32 mg/plant, only upper or only lower leaf surface; 0.64 mg/plant, upper and lower surface treated; 0.608 mg/plant, both surfaces treated, used for further extraction; 1.9 mg/plant lower leaf surface on a tree with beans	21, 35 Every 28 days 35	Glyphosate

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
			Hydroponic treatment at 1.1, 3.6 or 11.1 mg/L	21	Glyphosate
		Sugarcane; supportive only	Hydroponic treatment at 3 mg/plant	7, 28, 56, 84	Glyphosate
			Foliar application at 1.96 mg per plant	7, 28, 56, 84	Glyphosate
CP4 EPSPS & GOX modified crops	Root crops	Sugar beet	Pre-emergence at 0.9 kg/ha	158	Glyphosate
			Post-emergence 2x 1.08 kg/ha	91	
	Cereals/grass	Wheat	Spray applications 2x 0.84 kg/ha	5, 24-30, 84	Glyphosate
		Maize	Spray applications 1x 0.93 kg/ha and 1x 0.84 kg/ha	0, 37, 49-53, 83	Glyphosate
	Pulses/oilseeds	Canola	Post-emergence 1x 0.455 kg/ha	87	Glyphosate
			Post-emergence 2x 0.90 kg/ha	79	
		Soybean	Pre-emergence 1x 5.38 kg/ha	56, 84, 104	Glyphosate
			Early post-emergence 1x 0.84 kg/ha	35, 63, 83	
			Sequential post-emergence 1x 0.84 kg/ha and 1x 1.68 kg/ha	13, 41, 61	
		Cotton	Spray applications 1x 0.93 kg/ha and 1x 1.27 kg/ha	0, 27, 158	Glyphosate
GAT modified crops	Root crops	Maize	Pre-emergence 1x 4.26 kg/ha to bare soil and foliar applications 3x 1.1 kg/ha	48 DAT soil, 59 DAT3, 7 DAT4	Glyphosate
	Pulses/oilseeds	Canola	Pre-emergence 1x 4.5 kg/ha to bare soil and foliar applications 3x 1.0 kg/ha	38 DAT3, 90 DAT3, 7 DAT4	Glyphosate
		Soybean	Pre-emergence 1x 3.290 kg/ha to bare soil and 3 foliar applications 1x 1.410, 1x 2.284 and 1x 0.880 kg/ha	36 DAT soil, 4 DAT2, 82 DAT3, 14 DAT4	Glyphosate
Rotational crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**PBI** (DAT)	**Comment/Source**

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
	Root/tuber crops	Radish	Soil application at 6.5 kg/ha	30, 120, 365	Glyphosate
			Primary crop soybean seeds were planted immediately prior to application; soil application at 3.87 kg/ha (expressed as glyphosate equivalents)	35	Glyphosate trimesium salt
			Primary crop soybean seeds were planted immediately prior to application; soil application at 6.56 kg/ha split in three monthly applications (expressed as glyphosate equivalents)	63, 308	Glyphosate trimesium salt
		Carrot	Application on planted rye grass at 4.16 kg/ha; crop of soybeans was planted 7 days after application	30, 119, 364	Glyphosate
			Application at 4.48 kg/ha on planted pea	1-23	Glyphosate
			Application at 4.48 kg/ha on planted cabbage	1-23	Glyphosate
		Turnip	Soil application at 4.12 kg/ha (expressed as glyphosate equivalents)	35, 95, 370	Glyphosate trimesium salt
		Beet	Soil application at 2x 4.48 kg/ha; soybean was planted 3 days after application	30	Glyphosate
			Soil application at 4.48 kg/ha; soybean or wheat was planted 3 days after application	120	Glyphosate
			Soil application at 4.48 kg/ha; cabbage was planted 3 days after application	365	Glyphosate
	Leafy crops	Lettuce	Soil application at 6.5 kg/ha	30, 120, 365	Glyphosate
			Primary crop soybean seeds were planted immediately prior to application; soil application at 3.87 kg/ha (expressed as	35	Glyphosate trimesium salt

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
			glyphosate equivalents)		
			Primary crop soybean seeds were planted immediately prior to application; soil application at 6.56 kg/ha split in three monthly applications (expressed as glyphosate equivalents)	63, 308	Glyphosate trimesium salt
			Application on planted rye grass at 4.16 kg/ha; crop of soybeans was planted 7 days after application	30, 119, 364	Glyphosate
		Cabbage	Soil application at 2x 4.48 kg/ha; cabbage was planted 3 days after application	30	Glyphosate
			Soil application at 4.48 kg/ha; beet was planted 3 days after application	120	Glyphosate
			Soil application at 4.48 kg/ha; soybean or wheat was planted 3 days after application	365	Glyphosate
			Application at 4.48 kg/ha on planted pea	1-23	Glyphosate
			Application at 4.48 kg/ha on planted carrot	1-23	Glyphosate
			Application at 4.48 kg/ha on planted bean	1-23	Glyphosate
	Cereal (small grain)	Wheat	Soil application at 6.5 kg/ha	30, 120, 365	Glyphosate
			Primary crop soybean seeds were planted immediately prior to application; soil application at 3.87 kg/ha (expressed as glyphosate equivalents)	35	Glyphosate trimesium salt
			Primary crop soybean seeds were planted immediately prior to application; soil application at 6.56 kg/ha split in three monthly applications (expressed as	63, 308	Glyphosate trimesium salt

Primary crops (available studies)	**Crop groups**	**Crop(s)**	**Application(s)**	**Sampling** (DAT)	**Comment/Source**
			glyphosate equivalents)		
			Soil application at 4.12 kg/ha (expressed as glyphosate equivalents)	35, 95, 370	Glyphosate trimesium salt
			Soil application at 2x 4.48 kg/ha; wheat was planted 3 days after application	30	Glyphosate
			Soil application at 4.48 kg/ha; cabbage was planted 3 days after application	120	Glyphosate
			Soil application at 4.48 kg/ha; beet was planted 3 days after application	365	Glyphosate
		Barley	Application on planted rye grass at 4.16 kg/ha; crop of soybeans was planted 7 days after application	30, 119, 364	Glyphosate
		Sweet corn	Application at 4.48 kg/ha on planted bean	1-23	Glyphosate
	other	Pea	Application at 4.48 kg/ha on planted cabbage	1-23	Glyphosate
		Bean	Application at 4.48 kg/ha on planted carrot	1-23	Glyphosate

Processed commodities (hydrolysis study)	**Conditions**	**Stable?**	**Comment/Source**
	Pasteurisation (20 min, 90°C, pH 4)	Yes	Data available for glyphosate, AMPA, and N-acetyl AMPA
	Baking, brewing and boiling (60 min, 100°C, pH 5)	Yes	Data available for glyphosate, AMPA, and N-acetyl AMPA

Processed commodities	Conditions	Stable?	Comment/Source
	Sterilisation (20 min, 120°C, pH 6)	Yes	Data available for glyphosate, AMPA, and N-acetyl AMPA
	Other processing conditions	No data available, not required	

Can a general residue definition be proposed for primary crops?	No	Different residue definitions proposed for conventional and genetically modified crops
Rotational crop and primary crop metabolism similar?	Yes	
Residue pattern in processed commodities similar to residue pattern in raw commodities?	Yes	
Plant residue definition for monitoring (RD-Mo)	Conventional crops: glyphosate GMO crops: sum of glyphosate, AMPA and *N*-acetyl-glyphosate, expressed as glyphosate The residue definition is pending data gaps on genotoxicity for *N*-acetyl-glyphosate. Honey and bee products: glyphosate	
Plant residue definition for risk assessment (RD-RA)	Conventional crops: sum of glyphosate and AMPA, expressed as glyphosate However, an overall residue definition for all crops (both conventional and GMO crops) can be proposed as sum of glyphosate, AMPA, *N*-acetyl-glyphosate and *N*-acetyl-AMPA, expressed as glyphosate The residue definition is pending data gaps on genotoxicity for *N*-acetyl glyphosate, *N*-glyceryl AMPA, *N*-acetyl AMPA, *N*-methyl AMPA and *N*-malonyl AMPA. Honey and bee products: sum of glyphosate and AMPA, expressed as glyphosate	
Methods of analysis for monitoring of residues (analytical technique, matrix groups, LOQs)	LC-MS/MS LOQ 0.05 mg/kg for glyphosate and AMPA LOQ 0.025 mg/kg for *N*-acetylglyphosate Extraction efficiency-pending	

Stability of residues in plants

Plant products (available studies)	**Category**	**Commodity**	**T** (°C)	**Stability period**		**Comment/Source**
				Value	**Unit**	
	Glyphosate					
	High water content	Sugar beet leaves	-18	18	Months	Maximum general storage stability in high water matrix: 24 months
		Maize forage/green plants	-18	12	Months	
		Soybean forage	-18	Max.24	Months	
		Banana (whole fruit)	-18	12	Months	
		Tomato	-18	31	Months	
		Clover	-18	31	Months	
	High starch content	Maize grain	-18	Max. 24	Months	Maximum general storage stability in high starch matrix: 24 months
		Barley grain	-18	18	Months	
		Wheat/rye grain	-18	45	Months	
		Sorghum grain	-18	48	Months	
		Sugar beet roots	-18	18	Months	
	High oil content	Soybean seeds	-18	24	Months	Maximum general storage stability in high oil matrix: 24 months
		Oilseed rape/ linseeds	-18	18	Months	
	High protein content	Dry beans	-18	18	Months	
	High acid content	Orange	-18	24	Months	

Plant products (available studies)	**Category**	**Commodity**	**T** (°C)	**Stability period**		**Comment/Source**
				Value	**Unit**	
	Other matrices	Barley straw	-18	18	Months	
		Wheat/rye straw	-18	45	Months	
		Soybean straw	-18	24	Months	
		Soybean hay	-18	12	Months	
		Maize stover	-18	23	Months	
		Sorghum stover	-18	31	Months	
	AMPA					
	High water content	Sugar beet leaves	-18	18	Months	Maximum general storage stability in high water matrix: 18 months, except clover
		Maize forage/green plants	-18	12	Months	
		Soybean forage	-18	24	Months	
		Tomato	-18	31	Months	
		Clover	-18	1	Months	
	High starch content	Maize grain	-18	18	Months	Maximum general storage stability in high starch matrix: 10 - 12 months
		Barley grain	-18	Max.12	Months	
		Wheat/rye grain	-18	Max. 10	Months	
		Sorghum grain	-18	48	Months	
		Sugar beet roots	-18	Max. 12	Months	
	High oil content	Soybean seeds	-18	24	Months	
	High acid content	Orange	-18	24	Months	

Plant products (available studies)	**Category**	**Commodity**	**T** (°C)	**Stability period**		**Comment/Source**
				Value	**Unit**	
	Other matrices	Maize stover	-18	6	Months	
		Wheat/rye straw	-18	6	Months	
		Soybean straw	-18	24	Months	
		Soybean hay	-18	9	Months	
		Sorghum stover	-18	9	Months	
	N-acetyl glyphosate					
	High water content	Maize forage/ green plant	-18	12	Months	
		Soybean forage	-18	12	Months	
	High starch content	Maize grain	-18	12	Months	
	High oil content	Soybean seed	-18	12	Months	
	Other matrices	Maize stover	-18	12	Months	
		Soybean hay	-18	12	Months	
	N-acetyl AMPA					
	High water content	Maize forage/ green plant	-18	23	Months	
		Soybean forage	-18	18	Months	
	High starch content	Maize grain	-18	23	Months	
	High oil content	Soybean seed	-18	18	Months	
	Other matrices	Maize stover	-18	23	Months	
		Soybean hay	-18	18	Months	

Magnitude of residues in plants

Summary of residues data from the supervised residue trials – Primary crops

Commodity	**Region/ Indoor** [(a)]	**Residue levels observed in the supervised residue trials** (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	**Comments/Source**	**Calculated MRL** (mg/kg)	**HR** [(b)] (mg/kg)	**STMR** [(c)] (mg/kg)	**CF** [(d)]
Post-emergence uses							
Citrus fruits, stone fruits, pome fruits, kiwi, tree nuts, banana	NEU	**Mo:** 3x <0.05 **RA:** 3x <0.05	Combined NEU dataset on apple (2) and plum (1). Combined SEU dataset on mandarin (2), orange (2) hazelnut (1), pistachio (1), apple (2), apricot (4), cherry (2), peach (1), plum (6), kiwi (2), and banana (3). NEU and SEU datasets are pooled and data can be extrapolated to all orchard crops based on a risk envelope approach. Since residues of glyphosate and AMPA were both <0.05 mg/kg, only the LOQ of glyphosate was considered for the calculation of residues according to the RD-RA. It is noted that additional information regarding the extraction efficiency, and in some trials (2 NEU and 8 SEU) the derivatisation efficiency, of the	**0.05***	**Mo:** 0.05 **RA:** 0.05	**Mo:** 0.05 **RA:** 0.05	1
	SEU	**Mo:** 26x <0.05 **RA:** 26x <0.05					

Commodity	Region/ Indoor (a)	Residue levels observed in the supervised residue trials (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	Comments/Source	Calculated MRL (mg/kg)	HR (b) (mg/kg)	STMR (c) (mg/kg)	CF (d)
			analytical method is needed for confirmation. Appropriate risk mitigation measures shall be established on national level to prevent crop contamination.				
Vines (table grapes and wine grapes)	NEU	**Mo:** 9x <0.05 **RA:** 9x <0.05	NEU and SEU datasets are pooled for deriving the MRL and risk assessment values. Since residues of glyphosate and AMPA were both <0.05 mg/kg, only the LOQ of glyphosate was considered for the calculation of residues according to the RD-RA. It is noted that additional information regarding the extraction efficiency of the analytical method is needed for confirmation.	**0.05***	**Mo:** 0.05 **RA:** 0.05	**Mo:** 0.05 **RA:** 0.05	1
	SEU	**Mo:** 8x <0.05 **RA:** 8x <0.05					

Commodity	Region/ Indoor [a]	Residue levels observed in the supervised residue trials (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	Comments/Source	Calculated MRL (mg/kg)	HR [b] (mg/kg)	STMR [c] (mg/kg)	CF [d]
			Appropriate risk mitigation measures shall be established on national level to prevent crop contamination.				
Table olives	NEU	-	No data available for NEU (data requirement).	-	**Mo:** - **RA:** -	**Mo:** - **RA:** -	-
	SEU	**Mo:** 7x <0.05 **RA:** 4x <0.05	Since residues of glyphosate and AMPA were both <0.05 mg/kg, only the LOQ of glyphosate was considered for the calculation of residues according to the RD-RA. It is noted, however, that AMPA was determined in 4 trials only. It is noted that additional information regarding the extraction efficiency of the analytical method is needed for confirmation. Appropriate risk mitigation measures shall be established on national level to prevent crop contamination.	**0.05***	**Mo:** 0.05 **RA:** 0.05	**Mo:** 0.05 **RA:** 0.05	1
Post-harvest, pre-sowing, pre-planting, pre-emergence outdoor use							
Root and tuber	NEU	**Mo:** 17x <0.05	Combined NEU dataset on potato	**0.05***	**Mo:** 0.05	**Mo:** 0.05	1

Commodity	Region/ Indoor [a]	Residue levels observed in the supervised residue trials (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	Comments/Source	Calculated MRL (mg/kg)	HR [b] (mg/kg)	STMR [c] (mg/kg)	CF [d]
vegetables, bulb vegetables, fruiting vegetables, brassica, leafy vegetables, stem vegetables, sugar beets		**RA:** 17x <0.05	(2), carrot (2), onion (2), tomato (2), courgette (1), cauliflower (2), head cabbage (2), leaf lettuce (2), and leek (2). Combined SEU dataset on potato (2), carrot (2), onion (2), cucumber (1), courgette (1), cauliflower (2), head cabbage (2), head lettuce (2), leek (2), and sugar beet (2). NEU and SEU datasets are pooled and data can be extrapolated to all root and tuber vegetables, bulb vegetables, fruiting vegetables, brassica, leafy vegetables, stem vegetables, and sugar beets based on a risk envelope approach. Since residues of glyphosate and AMPA were both <0.05 mg/kg, only the LOQ of glyphosate was considered for the calculation of residues according to the RD-RA. It is noted that additional information regarding the extraction efficiency of the analytical method is needed for confirmation.		**RA:** 0.05	**RA:** 0.05	
	SEU	**Mo:** 18x <0.05 **RA:** 18x <0.05					

Commodity	Region/ Indoor [a]	Residue levels observed in the supervised residue trials (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	Comments/Source	Calculated MRL (mg/kg)	HR [b] (mg/kg)	STMR [c] (mg/kg)	CF [d]
Inter-row use							
Root and tuber vegetables, bulb vegetables, fruiting vegetables, legume vegetables, leafy vegetables	NEU	**Mo:** 13x <0.05 **RA:** 13x <0.05	Combined NEU dataset on onion (2), cucumber (2), courgette (1), head lettuce (2), parsley (2), and green beans (4). Combined SEU dataset on carrot (4), radish (2), onion (4), tomato (4), cucumber (2), courgette (2), head lettuce (4), parsley (2), and green beans (4). NEU and SEU datasets are pooled and data can be extrapolated to all root and tuber vegetables, bulb vegetables, fruiting vegetables, legume vegetables, and leafy vegetables based on a risk envelope approach. Since residues of glyphosate and AMPA were both <0.05 mg/kg, only the LOQ of glyphosate was considered for the calculation of residues according to the RD-RA. It is noted that additional information regarding the extraction efficiency of the analytical method is needed for confirmation.	**0.05***	**Mo:** 0.05 **RA:** 0.05	**Mo:** 0.05 **RA:** 0.05	1
	SEU	**Mo:** 28x <0.05 **RA:** 28x <0.05					

Commodity	Region/ Indoor (a)	Residue levels observed in the supervised residue trials (mg/kg) **Mo:** Glyphosate **RA:** Sum of glyphosate and AMPA, expressed as glyphosate	Comments/Source	Calculated MRL (mg/kg)	HR (b) (mg/kg)	STMR (c) (mg/kg)	CF (d)
			Appropriate risk mitigation measures shall be established on national level to prevent crop contamination.				
Summary of data on residues in pollen and bee products (Regulation (EU) No 283/2013, Annex Part A, point 6.10.1)							
Honey	NEU	**Mo:** 0.87, 3.2, 6.9 **RA:** 0.91, 3.2, 6.9	Calculation of MRL and risk assessment values provisional, pending the submission of one additional trial (data requirement). It is furthermore noted that additional information regarding the extraction efficiency of the analytical method is needed for confirmation.	**20**	**Mo:** 6.9 **RA:** 6.9	**Mo:** 3.2 **RA:** 3.2	1

* Indicates that the MRL is proposed at the limit of quantification.

Mo: residue levels expressed according to the monitoring residue definition; RA: residue levels expressed according to risk assessment residue definition.

(a): NEU: Outdoor trials conducted in northern Europe, SEU: Outdoor trials conducted in southern Europe, Indoor: indoor EU trials or Country code: if non-EU trials.

(b): Highest residue. The highest residue for risk assessment (RA) refers to the whole commodity and not to the edible portion.

(c): Supervised trials median residue. The median residue for risk assessment (RA) refers to the whole commodity and not to the edible portion.

(d): Conversion factor to recalculate residues according to the residue definition for monitoring to the residue definition for risk assessment.

Residues in rotational crops

Overall summary

Residues in rotational and succeeding crops expected based on confined rotational crop study?	Yes	
Residues in rotational and succeeding crops expected based on field rotational crop study?	Yes, but still inconclusive, since there is a data requirement for field studies	Data requirement for field rotational crop studies.

Summary of residues data from the rotational crops residue trials (if relevant, e.g. MRL, STMR, HR derived from rotational crops)

Commodity	**Region/ Indoor** (a)	**PBI (days)** (b)	**Residue levels observed in the supervised residue trials** (mg/kg)	**Comments/Source**	**Calculated MRL** (mg/kg)	**HR** (c) (mg/kg)	**STMR**(d) (mg/kg)	**CF** (e)
				Data requirement for field rotational crop studies.				

* Indicates that the MRL is proposed at the limit of quantification.

Mo: residue levels expressed according to the monitoring residue definition; RA: residue levels expressed according to risk assessment residue definition.

(a): NEU: Outdoor trials conducted in northern Europe, SEU: Outdoor trials conducted in southern Europe, Country code: if non-EU trials.

(b): Plant-back interval: The interval (days, months, years) between the final application of a pesticide product to a primary crop and the planting of a rotational crop.

(c): Highest residue. The highest residue for risk assessment (RA) refers to the whole commodity and not to the edible portion.

(d): Supervised trials median residue. The median residue for risk assessment (RA) refers to the whole commodity and not to the edible portion.

(e): Conversion factor to recalculate residues according to the residue definition for monitoring to the residue definition for risk assessment.

Processing factors

Processed commodity	Number of valid studies[a]	Processing Factor (PF)		CF_P[b]	Comment/ Source
		Individual values	Median PF		
Olive/Raw oil	3	<0.03, <0.04, <0.05, <0.05, <0.10, <0.11, <0.12, <0.24, <0.29, <0.39, <0.45	<0.11	1	CF determined to be 1 since no residues of AMPA were determined in the RAC or processed commodity.
Olive/Refined oil	1	<0.05, <0.24, <0.39, <0.45	<0.32	1	CF determined to be 1 since no residues of AMPA were determined in the RAC or processed commodity.

PF: Processing factor (=Residue level in processed commodity expressed according to RD-Mo/ Residue level in raw commodity expressed according to RD-Mo);
CF_p: Conversion factor for risk assessment in processed commodity (=Residue level in processed commodity expressed according to RD-RA / Residue level in processed commodity expressed according to RD-Mo)
(a): Studies with residues in the RAC at or close to the LOQ were disregarded (unless concentration may occur)
(b): Median of the individual conversion factors for each processing residues trial.
(c): A tentative PF is derived based on a limited dataset.

Residues in livestock

Relevant groups (subgroups)	Dietary burden expressed in				Most critical subgroup (a)	Most critical commodity (b)	Trigger exceeded (Y/N)	Comments
	mg/kg bw per day		mg/kg DM					
	Median	Maximum	Median	Maximum				
Cattle (all)	0.013	0.013	0.43	0.43	Dairy cattle	Swede (roots)	Y	
Cattle (dairy only)	0.013	0.013	0.33	0.33	Dairy cattle	Swede (roots)	Y	
Sheep (all)	0.013	0.013	0.37	0.37	Lamb	Swede (roots)	Y	
Sheep (ewe only)	0.012	0.012	0.37	0.37	Ram/Ewe	Swede (roots)	Y	
Swine (all)	0.008	0.008	0.34	0.34	Swine (breeding)	Swede (roots)	Y	
Poultry (all)	0.006	0.008	0.08	0.08	Poultry (layer)	Swede (roots)	Y	
Poultry (layer only)	0.006	0.008	0.08	0.08	Poultry (layer)	Swede (roots)	Y	
Fish	N/A	N/A	N/A	N/A	N/A			

(a): When one group of livestock includes several subgroups (e.g. poultry "all" including broiler, layer and turkey), the result of the most critical subgroup is identified from the maximum dietary burdens expressed as "mg/kg bw per day".
(b): The most critical commodity is the major contributor identified from the maximum dietary burden expressed as "mg/kg bw per day".

Nature of residues and methods of analysis in livestock

Metabolism studies, methods of analysis and residue definitions in livestock

Livestock (available studies)	**Animal**	**Dose** (mg/kg bw/d)	**Duration** (days)	**Comment/Source**
	Laying hen	17.9	7 and 5	*N*-(phosphono-^{14}C-methyl)glycine
		8.86 glyphosate and 0.98 AMPA 7.95 glyphosate and 0.88 AMPA 26.78 glyphosate and 2.98 AMPA 7.76 glyphosate and 0.86 AMPA	7	9:1 mixture of *N*-(phosphono-^{13}C/^{14}C-methyl)glycine and amino-^{13}C/^{14}C-methylphosphonic acid
		5.9	10	*N*-(phosphono-^{14}C-methyl)glycine trimesium salt
		4.4	7	[^{14}C]-*N*-Acetyl glyphosate
	Lactating ruminants (goat)	7.6; 6.4	5 and 3	*N*-(phosphono-^{14}C-methyl)glycine
		2.6 glyphoste and 0.29 AMPA	5	9:1 mixture of *N*-(phosphono-^{13}C/^{14}C-methyl)glycine and amino-^{13}C/^{14}C-methylphosphonic acid
		3.9		*N*-(phosphono-^{14}C-methyl)glycine trimesium salt
		8.42		[^{14}C]-*N*-Acetylglyphosate
	Pig	-	-	Not triggered
	Fish	-	-	Not triggered

Time needed to reach a plateau concentration in milk and eggs (days)	Milk: 7	
	Eggs: 14	
Metabolism in rat and ruminant similar	yes	

Can a general residue definition be proposed for animals?	yes	
Animal residue definition for monitoring (RD-Mo)	Sum of glyphosate, AMPA and *N*-acetyl glyphosate, expressed as glyphosate. The residue definition is pending data gaps on genotoxicity for *N*-acetyl-glyphosate.	
Animal residue definition for risk assessment (RD-RA)	Sum of glyphosate, AMPA, *N*-acetyl glyphosate and N-acetyl AMPA, expressed as glyphosate. The residue definition is pending data gaps on genotoxicity for *N*-acetyl glyphosate and *N*-acetyl AMPA.	
Fat soluble residues	No	
Methods of analysis for monitoring of residues (analytical technique, matrix groups, LOQs)	LC-MS/MS LOQ 0.025 mg/kg for glyphosate, AMPA and *N*-acetylglyphosate Extraction efficiency-pending	

Stability of residues in livestock

Animal products (available studies)	**Animal**	**Commodity**	**T** (°C)	**Stability period**		**Compounds covered**	**Comment/ Source**
				Value	**Unit**		
	Pig	Fat, muscle, liver, kidney	-18	26	Months	Glyphosate	
	Ruminant	Fat, muscle, liver, kidney	-18	24	Months		
	Ruminant	Milk	-18	22	Months		
	Poultry	Fat, muscle, liver	-18	25	Months		
	Poultry	Kidney	-18	13	Months		
	Poultry	Eggs	-18	Max. 14	Months		

	Pig	Muscle, liver, kidney	-18	26	Months	AMPA	
	Pig	Fat	-18	Max.15			
	Ruminant	Fat, muscle, liver, kidney	-18	24	Months		
	Ruminant	Milk	-18	16	Months		
	Poultry	Fat, muscle, liver	-18	25	Months		
	Poultry	Kidney	-18	13	Months		
	Poultry	Eggs	-18	Max. 14	Months		

Magnitude of residues in livestock

Summary of the residue data from livestock feeding studies

Animal commodity	Residues at the closest feeding level (mg/kg)		Estimated value at 1N		MRL proposal (mg/kg)	CF [(c)]
	Mean	Highest	$STMR_{Mo}$ [(a)] (mg/kg)	HR_{Mo} [(b)] (mg/kg)		
Cattle (all) - Closest feeding level (1 mg/kg bw; 80 N rate) [(d)]						
Muscle	<0.1	<0.1	<0.1	<0.1	0.1*	1
Fat	<0.2	<0.2	<0.2	<0.2	0.2*	1
Liver	<0.2	<0.2	<0.2	<0.2	0.2*	1
Kidney	<0.2	<0.2	<0.2	<0.2	0.2*	1
Cattle (dairy only) - Closest feeding level (1 mg/kg bw; 80 N rate) [(d)]						
Milk	<0.1	n.a.	<0.1	<0.1	0.1*	1
Sheep (all) [(e)] - Closest feeding level (1 mg/kg bw; 78 N rate) [(d)]						
Muscle	<0.1	<0.1	<0.1	<0.1	0.1*	1
Fat	<0.2	<0.2	<0.2	<0.2	0.2*	1
Liver	<0.2	<0.2	<0.2	<0.2	0.2*	1
Kidney	<0.2	<0.2	<0.2	<0.2	0.2*	1
Sheep (ewe only) [(e)] - Closest feeding level (1 mg/kg bw; 80 N rate) [(d)]						
Milk	<0.1	n.a.	<0.1	<0.1	0.1*	1
Swine (all) [(e)] - Closest feeding level (1 mg/kg bw; 126 N rate) [(d)]						
Muscle	<0.1	<0.1	<0.1	<0.1	0.1*	1
Fat	<0.2	<0.2	<0.2	<0.2	0.2*	1
Liver	<0.2	<0.2	<0.2	<0.2	0.2*	1
kidney	<0.2	<0.2	<0.2	<0.2	0.2*	1
Poultry (all) - Closest feeding level (1.2 mg/kg bw; 216 N rate) [(d)]						
Muscle	<0.1	<0.1	<0.1	<0.1	0.1*	1
Fat	<0.2	<0.2	<0.2	<0.2	0.2*	1
Liver	<0.2	<0.2	<0.2	<0.2	0.2*	1
Poultry (layer only) - Closest feeding level (1.2 mg/kg bw; 216 N rate) [(d)]						
Eggs	<0.1	<0.1	<0.1	<0.1	0.1*	1

* Indicates that the MRL is proposed at the limit of quantification.

Note RMS: Proposed MRLs (at LOQ) are in line with the conclusions in Article 12 MRL Review (EFSA 2019) where the combined LOQs of 0.1 and 0.2 mg/kg were reported in animal commodities.

n.a.: not applicable

n.r. : not reported

(a): Median residues expressed according to the residue definition for monitoring, recalculated at the 1N rate for the median dietary burden.

(b): Highest residues expressed according to the residue definition for monitoring, recalculated at the 1N rate for the maximum dietary burden.

(c): Conversion factor to recalculate residues according to the residue definition for monitoring to the residue definition for risk assessment; proposed as 1 since N-acetyl-AMPA is not expected at significant levels.

(d): Closest feeding level and N dose rate related to the maximum dietary burden.
(e): Since extrapolation from cattle to other ruminants and swine is acceptable, results of the livestock feeding study on ruminants were relied upon to derive the MRL and risk assessment values in sheep and swine.

Consumer risk assessment

ARfD	1.5 mg/kg bw (current renewal)
Highest IESTI, according to EFSA PRIMo (rev.3.1)	Honey: 2% of ARfD
NESTI (% ARfD)	Not applicable
Assumptions made for the calculations	The calculation is based on the highest residue levels. The LOQ of glyphosate was used as input value in case residues of glyphosate and AMPA were both below the LOQ in the RACs. Additional input is required from glyphosate and AMPA residues in rotational crops, and acceptability of the residue data needs to be confirmed by additional information on extraction efficiency.

ADI	0.1 mg/kg bw per day (current renewal)
TMDI according to EFSA PRIMo	Highest TMDI: 9% ADI (NL toddlers)
NTMDI	Not applicable
Highest IEDI	Not applicable
NEDI (% ADI)	Not applicable
Assumptions made for the calculations	The calculation is based on the median residue levels. The LOQ of glyphosate was used as input value in case residues of glyphosate and AMPA were both below the LOQ in the RACs. Additional input is required from glyphosate and AMPA residues in rotational crops, and acceptability of the residue data needs to be confirmed by additional information on extraction efficiency.

Consumer exposure assessment through drinking water resulting from groundwater metabolite(s) according to SANCO/221/2000 rev.10 Final (25/02/2003)

Metabolite(s)	AMPA
ADI (mg/kg bw per day)	0.1 mg/kg bw/day
Intake of groundwater metabolites (% ADI)	Adult: 0.96% Children: 2.89% Infants: 4.34%

Recommended MRLs

Code[(a)]	Commodity	Existing EU MRL (mg/kg)	Proposed EU MRL (mg/kg)	Comment/justification
Enforcement residue definition: Glyphosate				
Representative uses				
0110000	Citrus fruit	0.1*-0.5	0.05*	The MRL proposal reflects the NEU and SEU post-emergence use. Risk for consumers unlikely.
0120000	Tree nuts	0.1*	0.05*	
0130000	Pome fruit	0.1*	0.05*	
0140000	Stone fruit	0.1*	0.05*	
0151000	Table and wine grapes	0.5	0.05*	The MRL proposal reflects the NEU and SEU post-emergence use. Risk for consumers unlikely.
0161030	Table olives	1	0.05*	The MRL proposal reflects the SEU post-emergence use. For the NEU use the data were not sufficient to derive a MRL proposal (data requirement). Risk for consumers unlikely.
0162010	Kiwi	0.1*	0.05*	The MRL proposal reflects the NEU and SEU post-emergence use. Risk for consumers unlikely.
0163020	Banana	0.1*	0.05*	
0210000	Root and tuber vegetables	0.1*-0.5	0.05*	The MRL proposal reflects the NEU and SEU post-harvest, pre-sowing, pre-planting, pre-emergence, and inter-row use. Risk for consumers unlikely.
0220000	Bulb vegetables	0.1*	0.05*	
0230000	Fruiting vegetables	0.1*-3	0.05*	
0240000	Brassica vegetables	0.1*	0.05*	The MRL proposal reflects the NEU and SEU post-harvest, pre-sowing, pre-planting, pre-emergence use. Risk for consumers unlikely.
0250000	Leafy vegetables, herbs and edible flowers	0.1*	0.05*	The MRL proposal reflects the NEU and SEU post-harvest, pre-sowing, pre-planting, pre-emergence, and inter-row use. Risk for consumers unlikely.
0260000	Legume vegetables	0.1*	0.05*	The MRL proposal reflects the NEU and SEU inter-row use. Risk for consumers unlikely.
0270000	Stem vegetables	0.1*	0.05*	The MRL proposal reflects the NEU and SEU post-harvest, pre-sowing, pre-planting, pre-emergence use. Risk for consumers unlikely.
0900010	Sugar beet roots	15	0.05*	
MRL application				
1040000	Honey	0.05*	-	The available data are not sufficient to derive a MRL proposal. Based on the available data, however, it is obvious

Code[(a)]	Commodity	Existing EU MRL (mg/kg)	Proposed EU MRL (mg/kg)	Comment/justification
				that the MRL in honey needs to be raised to support the intended uses. Risk for consumers unlikely.

* Indicates that the MRL is set at the limit of analytical quantification (LOQ)

(a): Commodity code number according to Annex I of Regulation (EC) No 396/2005

(F): Fat soluble

Environmental fate and behaviour

Route of degradation (aerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.1)

Mineralisation after 100 days	16.9-70.6 % after 60-364 d (n[6] = 15)
Non-extractable residues after 100 days	2.5-21.6 % after 60-364 d (n = 15)
Metabolites requiring further consideration - name and/or code, % of applied (range and maximum)	AMPA: Laboratory: 42.4 % after 7 d (n= 15) Field: 46.9% after 271 d (n=5) Sterile conditions laboratory: max. 20.7 % after 70 d (still increasing, n= 1)

Route of degradation (anaerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.2)

Mineralisation after 100 days	12.5 % after 120 d (n= 1)
Non-extractable residues after 100 days	22.5 % after 120 d (n= 1)
Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	AMPA – 30.2 % AR after 84 d (n=1)

Route of degradation (photolysis) on soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3)

Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	AMPA – 8.2 % AR after 7 d (n=1) (minor non transient) (6.1 % after 3 d in dark control)
Mineralisation at study end	14.6 % after 30 d (n= 1)
Non-extractable residues at study end	15.5 % after 30 d (n= 1)

[6] n corresponds to the number of soils.

Rate of degradation in soil (aerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Parent	Dark aerobic conditions – Trigger endpoints					
Soil	pH (H_2O)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	Kinetic parameters	St. (χ^2)	Method of calculation
[redacted] (2010): Gartenacker Loam	7.1	20 / 50 % pF2.5	8.8/57.3	k_1: 0.2138 k_2: 0.03023 g: 0.4345	2.9	DFOP
[redacted] (2010): Drusenheim Loam	7.4	20 / 50 % pF2.5	2.3 / 14.9	α: 1.414 β: 3.635	4.2	FOMC
[redacted] (2010): Pappelacker Loamy sand	7.0	20 / 50 % pF2.5	3.9 / 38.7	k_1: 0.3125 k_2: 0.03172 g: 0.6584	5.0	DFOP
[redacted] (2010): 18-Acres Sandy clay loam	5.7	20 / 50 % pF2.5	78.9 / 588	k_1: 0.05856 k_2: 0.003146 g: 0.3644	3.4	DFOP
[redacted] (1996): Soil B Sandy loam	6.7	25 / 75 % FC	0.7 / 16.2	k_1: 2.306 k_2: 0.08875 g: 0.58	8.2	DFOP
[redacted] (1995): Arrow Sandy loam	6.4[a]	20 / 40	37.8 / 1660	α: 0.4539 β: 10.47	2.3	FOMC
[redacted] (1993): Les Evouettes Silt loam	6.1[b]	20 / 40	11.5 / 358	α: 0.51 β: 3.96	5.9	FOMC
[redacted] (1993): Speyer 2.2 Sand	6.0[b]	20 / 40	2.0 / 151	k_1: 8.104 k_2: 0.01078 g: 0.4893	8.6	DFOP
[redacted] (1993): Speyer 2.3 Loamy sand	6.9[b]	20 / 40	6.2 / 20.4	k: 0.1127	8.0	SFO
[redacted] (1992): Speyer 2.1, dose group A Sand	6.9	20 / 40	9.0/ 63.7	k1:0.3685 k2: 0.02889 g: 0.3702	9.7	DFOP

[a] Calculated with equation reported in EFSA guidance 2017[7]: pH_{H2O}=0.982pH_{CaCl2} + 0.648.
[b] Medium not reported, H_2O assumed

For modelling endpoints of glyphosate, two datasets are presented:

- Endpoints derived from parent-only fits;
- Endpoints derived from pathway fits (glyphosate → AMPA).

Parent		Dark aerobic conditions – **Modelling endpoints based on parent-only fits**						
Soil	pH (H_2O)	t. °C / % MWHC	Actual DT_{50} /DT_{90} (d)	Modelling DT_{50} (not normalized)[a]	DT_{50} (d) 20 °C pF2/10kPa[b]	DT_{90}[e] (d) 20 °C pF2/10kPa[a]	St. (χ^2)	Method of calculation
[redacted] (2010): Gartenacker Loam	7.1	20 / 50 % pF2.5	9.0/60	18.1	9.9	32.0	4.0	FOMC
[redacted] (2010): Drusenheim Loam	7.4	20 / 50 % pF2.5	2.3/15	4.5	2.2	7.2	4.2	FOMC
[redacted] (2010):	7.0	20 /	4.0/37	11.1	5.1	17.0	4.5	FOMC

[7] EFSA (European Food Safety Authority), 2017. EFSA Guidance Document for predicting environmental concentrations of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2017;15(10):4982, 115 pp. https://doi.org/10.2903/j.efsa.2017.4982

Pappelacker Loamy sand		50 % pF2.5						
[redacted] (2010): 18-Acres Sandy clay loam	5.7	20 / 50 % pF2.5	76.3/523	192.6	109.8	298.1	2.6	DFOP
[redacted] (1996): Soil B Sandy loam	6.7	25 / 75 % FC	1.0/20.1	6.1	6.5	21.7	8.6	FOMC
[redacted] (1995): Arrow Sandy loam	6.4[c]	20 / 40	37.4/440	187.3	161.1	378.4	3.6	DFOP
[redacted] (1993): Les Evouettes Silt loam	6.1[d]	20 / 40	11.5/358	107.8	71.2	236.3	5.9	FOMC
[redacted] (1993): Speyer 2.2 Sand	6.0[d]	20 / 40	2.0/151	64.3	44.4	104.2	8.6	DFOP
[redacted] (1993): Speyer 2.3 Loamy sand	6.9[d]	20 / 40	6.1/20.3	6.1	3.2	10.8	8.0	SFO
[redacted] (1992): Speyer 2.1, dose group A Sand	6.9	20 / 40	6.0/165	49.7	49.7	165.0	6.8	FOMC
pH dependence					Yes, glyphosate is more persistent with decreasing pH			

[a] DT90/3.32 for FOMC kinetics; ln(2)/k2 value for DFOP kinetics
[b] Normalised using a Q_{10} of 2.58 and Walker equation coefficient of 0.7
[c] Calculated with equation reported in EFSA guidance 2017[4]: $pH_{H2O}=0.982pH_{CaCl2} + 0.648$.
[d] Medium not reported, H_2O assumed
[e] Modelling DT90 also reported since it is used to assess pH-dependency

Parent	Dark aerobic conditions – **Modelling endpoints based on pathway fit** (glyphosate → AMPA)							
Soil	pH (H_2O)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	Kinetic parameters	Fast | Slow DT_{50} (d) 20 °C pF2/10kPa[a]	DT_{90}[d] (d) 20 °C pF2/10kPa[a]	St. (χ^2)	Method of calculation
[redacted] (2010): Gartenacker Loam	7.1	20 / 50 % pF2.5	8.8 / 57.3	k_1: 0.2138 k_2: 0.03023 g: 0.4345	1.8 | 12.6	31.5	2.9	DFOP
[redacted] (2010): Drusenheim Loam	7.4	20 / 50 % pF2.5	2.3 / 13.4	k_1: 0.9889 k_2: 0.1375 g: 0.3704	0.3 | 2.4	6.4	4.8	DFOP
[redacted] (2010): Pappelacker Loamy sand	7.0	20 / 50 % pF2.5	3.9 / 38.7	k_1: 0.3125 k_2: 0.03172 g: 0.6584	1.0 | 10.1	17.8	5.0	DFOP
[redacted] (2010): 18-Acres Sandy clay loam	5.7	20 / 50 % pF2.5	78.6 / 588	k_1: 0.05856 k_2: 0.003146 g: 0.3644	6.7 | 125.6	335.2	3.4	DFOP
[redacted] (1996): Soil B Sandy loam	6.7	25 / 75 % FC	0.7 / 16.2	k_1: 2.306 k_2: 0.08875 g: 0.58	0.3 | 8.4	17.5	8.2	DFOP

[redacted] (1995): Arrow Sandy loam	6.4[b]	20 / 40	37.4 / 440	k_1: 0.0595 k_2: 0.0037 g: 0.4852	10.0 | 161.1	378.4	4.7	DFOP
[redacted] (1993): Les Evouettes Silt loam	6.1[c]	20 / 40	9.8 / 192	k_1: 0.2084 k_2: 0.008013 g: 0.5339	2.2 | 57.1	126.7	6.3	DFOP
[redacted] (1993): Speyer 2.2 Sand	6.0[c]	20 / 40	2.0 / 151	k_1: 8.104 k_2: 0.01078 g: 0.4893	0.1 | 44.4	104.2	8.6	DFOP
[redacted] (1993): Speyer 2.3 Loamy sand	6.9[c]	20 / 40	6.2 / 20.4	k: 0.1127	3.3	10.8	8.0	SFO
[redacted] (1992): Speyer 2.1, dose group A Sand	6.9	20 / 40	9.0 / 63.7	k_1:0.3685 k_2: 0.02889 g: 0.3702	1.9 | 24.0	63.7	9.7	DFOP
pH dependence					Yes, glyphosate is more persistent with decreasing pH			

[a] Normalised using a Q_{10} of 2.58 and Walker equation coefficient of 0.7
[b] Calculated with equation reported in EFSA guidance 2017[8]: $pH_{H2O}=0.982pH_{CaCl2} + 0.648$.
[c] Medium not reported, H_2O assumed
[d] Modelling DT90 also reported since it is used to assess pH-dependency

Rate of degradation in soil (aerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

AMPA	Trigger endpoints Dark aerobic conditions Metabolite dosed or the precursor from which the f f. was derived was glyphosate						
Soil	pH (H_2O)	t. ºC / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	Kinetic parameters	St. (χ^2)	Method of calculation
[redacted] (2010): Gartenacker Loam	7.1	20 / 50 % pF2.5	112 / 373	0.1955	k: 0.006181	7.6	SFO
[redacted] (2010): Drusenheim Loam	7.4	20 / 50 % pF2.5	28.6 / 95.1	0.3000	k: 0.02421	3.5	SFO
[redacted] (2010): Pappelacker Loamy sand	7.0	20 / 50 % pF2.5	88.2 / 293	0.2004	k: 0.007863	6.2	SFO
[redacted] (2010): 18-Acres Sandy clay loam	5.7	20 / 50 % pF2.5	1000 / 3320	0.2618	k: 0.00069	9.2	SFO
[redacted] (1996): Soil B Sandy loam	6.7	25 / 75 % FC	96.4 / 320	0.2793	k: 0.007187	10.1	SFO
[redacted] (1993): Speyer 2.3 Loamy sand	6.9[a]	20 / 40	79.2 / 263	0.3406	k: 0.008753	8.2	SFO

[8] EFSA (European Food Safety Authority), 2017. EFSA Guidance Document for predicting environmental concentrations of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2017;15(10):4982, 115 pp. https://doi.org/10.2903/j.efsa.2017.4982

AMPA	Trigger endpoints Dark aerobic conditions Metabolite dosed or the precursor from which the f f. was derived was glyphosate						
Soil	pH (H_2O)	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	Kinetic parameters	St. (χ^2)	Method of calculation
[redacted] (1992): Speyer 2.1, dose group A Sand	6.9	20 / 40	200 / 666	0.4796	k: 0.003459	3.2	SFO
[redacted] (2017): Warsop Loamy sand	4.71	20 / pF 2	326 / 1080	-	k: 0.002128	1.3	SFO
[redacted], 2020: 18-Acres Sandy clay loam	5.5	20 / pF 2	1040 / 3450	-	k: 0.000666	3.0	SFO
[redacted] 2020: Brierlow, Silt loam	5.7	20 / pF 2	1000 / 3320	-	k: 0.000693	3.2	SFO

[a] Medium not reported, H_2O assumed

AMPA	Modelling endpoints Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was glyphosate						
Soil	pH (H_2O)	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
[redacted] (2010): Gartenacker Loam	7.1	20 / 50 % pF2.5	112 / 373	0.1955	61.6	7.6	SFO
[redacted] (2010): Drusenheim Loam	7.4	20 / 50 % pF2.5	28.6 / 95.1	0.3000	13.4	3.9	SFO
[redacted] (2010): Pappelacker Loamy sand	7.0	20 / 50 % pF2.5	88.2 / 293	0.2004	40.6	6.2	SFO
[redacted] (2010): 18-Acres Sandy clay loam	5.7	20 / 50 % pF2.5	1000 / 3320	0.2618	570	9.2	SFO
[redacted] (1996): Soil B Sandy loam	6.7	25 / 75 % FC	96.4 / 320	0.2793	104	10.1	SFO
[redacted] (1993): Speyer 2.3 Loamy sand	6.9[a]	20 / 40	79.2 / 263	0.3406	42	8.2	SFO
[redacted] (1992): Speyer 2.1, dose group A Sand	6.9	20 / 40	200 / 666	0.4796	200	3.2	SFO
[redacted] (2017): Warsop Loamy sand	4.71	20 / pF 2	326 / 1080	-	326	1.6	SFO
[redacted] 2020: 18-Acres Sandy clay loam	5.5	20 / pF 2	1040 / 3450	-	1040	3.0	SFO

AMPA	Modelling endpoints Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was glyphosate						
Soil	pH (H_2O)	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
[redacted] 2020: Brierlow, Silt loam	5.7	20 / pF 2	1000 / 3320	-	1000	3.2	SFO
Mean value (n=7)				0.29			
pH dependence					Yes, AMPA is more persistent with decreasing pH		

[a] Medium not reported, H_2O assumed

Rate of degradation field soil dissipation studies (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.1)

Parent	Aerobic conditions – trigger endpoints						
Soil	Location	pH	Depth (cm)	DT_{50} / DT_{90} (d) actual	Kinetic parameters	St. (χ^2)	Method of calculation
Egerkingen [redacted] (1992b) Clay loam (bare soil)	Switzerland	7.79 [a]	0-30	1.1 / 179	k_1: 2.653 k_2: 0.0087 g: 0.5228	5.3	DFOP
Bad Krozingen [redacted] (1992c) Sandy loam (bare soil)	Germany	6.6 [a]	0-30	2.7 / 122	α: 0.45 β: 0.7373	5.3	FOMC
Menslage [redacted] (1992d) Sand (bare soil)	Germany	5.6 [a]	0-30	5.8 / 201	k_1: 0.1781 k_2: 0.0041 g: 0.7704	9.4	DFOP
Ontario [redacted] (1993) Loamy sand (bare soil)	Canada	6.8[b]	0-45	13.7 / 54.4	k_1: 0.0551 k_2: 0.0017 g: 0.9420	22.3	DFOP
California [redacted] (1993a) Loamy sand (bare soil)	USA	6.3 [b]	0-121.9	13.0 / 102	k_1: 0.1124 k_2: 0.0148 g: 0.5490	12.7	DFOP
Ohio [redacted] (1993a) Loam (bare soil)	USA	7.8 [b]	0-121.9	2.4 / 61.5	k_1: 0.5430 k_2: 0.0194 g: 0.6704	13.3	DFOP

[a)] Measured in KCl in the study, converted to pH_{H2O} considering the formula pH_{H2O} = 0:860pH_{KCl} + 1.482 presented in the EFSA guidance for predicting environmental concentration in soil (2017)
[b)] Medium not given – value from the 0-15 cm depth layer

Parent	Aerobic conditions – modelling endpoints							
Soil	Location.	pH	Depth (cm)	DT_{50} (d) Norm[b].	Kinetic parameters	DT_{90}(d) Norm[b].	St. (χ^2)	Method of calculation
Menslage [redacted] (1992d) Sand (bare soil)	Germany	5.6 [a]	0-30	46.0	k_2: 0.0151	-	6.8	HS – slow phase
California [redacted] (1993) Loamy sand (bare soil)	USA	6.3 [c]	0-121.9	32.6	k: 0.0213	108	22.0	SFO

Parent	Aerobic conditions – modelling endpoints							
Soil	Location.	pH	Depth (cm)	DT_{50} (d) Norm[b].	Kinetic parameters	DT_{90}(d) Norm[b].	St. (χ^2)	Method of calculation
Menslage [redacted] (1992d) Sand (bare soil)	Germany	5.6 [a]	0-30	46.0	k_2: 0.0151	-	6.8	HS – slow phase
New York [redacted] (1993) Sandy clay loam (bare soil)	USA	5.8	0-121.9					Data gap, further fits required (following EFSA DegT50 flowchart)

[a)] Measured in KCl in the study, converted to pH_{H2O} considering the formula pH_{H2O} = 0:860pH_{KCl} + 1.482 presented in the EFSA guidance for predicting environmental concentration in soil (2017)
[b)] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7, values are DegT50matrix
[c)] Medium not given – value from the 0-15 cm depth layer

Rate of degradation field soil dissipation studies (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.1)

AMPA	Trigger endpoints	Aerobic conditions Metabolite dosed or the precursor from which the f f. was derived was glyphosate						
Soil	Location	pH (H2O)	Depth (cm)	DT_{50} (d) actual	DT_{90} (d) actual	St. (χ^2)	f. f. k_f / k_{dp}	Method of calculation
Egerkingen [redacted] (1992b) Clay loam (bare soil)	Germany	7.79 [a]	0-30					Data gap for fit from parent
Ohio [redacted] (1993) Loam (bare soil)	USA	7.8 [b]	0-121.9					Data gap for decline fit

[a)] Measured in KCl in the study, converted to pH_{H2O} considering the formula pH_{H2O} = 0:860pH_{KCl} + 1.482 presented in the EFSA guidance for predicting environmental concentration in soil (2017)
[b)] Medium not given – value from the 0-15 cm depth layer

Combined laboratory and field kinetic endpoints for modelling (when not from different populations)

Rate of degradation in soil active substance, normalised geometric mean (if not pH dependent)	Laboratory and field data can be pooled, however no geomean is determined due to pH dependence
Rate of degradation in soil transformation products, normalised geometric mean (if not pH dependent)	No modelling field value for AMPA
Kinetic formation fraction (f. f. k_f / k_{dp}) of transformation products, arithmetic mean	No modelling field value for AMPA

Soil accumulation (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.2)

Soil accumulation and plateau concentration	Refer to PECaccumulation calculations

Rate of degradation in soil (anaerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Parent	Dark anaerobic conditions					
Soil type	pH[a)]	t. °C / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C[b)]	St. (χ^2)	Method of calculation
Sandy loam	5.9	20°C, flooded	> 1000	-	1.6	DFOP

a) Measured inKCl
b) Normalised using a Q10 of 2.58

Soil adsorption active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Soil Type	OC (%)	pH ($CaCl_2$)	pH (H_2O)	K_D (mL/g)	$K_{D, OC}$ (mL/g)	K_F (mL/g)	$K_{F, OC}$ (mL/g)	1/n
Speyer 2.2, sandy loam	1.71	5.6	5.21	-	-	59.44	3476	0.546
RefeSol 01-A, loamy sand	0.8	5.33	6.11	-	-	59.80	7476	0.704
18 Acres, sandy clay loam	1.9	6.2	6.11	-	-	166.4	8755	0.579
M-SL-PF (Mutchler, US), sandy clay loam	1.9	6.1	6.44	-	-	152.4	8024	0.546
Speyer 2.3, sandy loam	0.67	5.9	7.02	-	-	52.9	7892	0.751
RefeSol 02-A, silt loam	0.92	6.19	6.98	-	-	88.46	9615	0.658
Gartenacker, loam	2.1	7.1	7.16	-	-	21.6	1031	0.757
Speyer 6S, clay	1.78	7.2	7.32	-	-	70.52	3962	0.736
Speyer 5M, sandy loam	0.92	7.4	7.56	-	-	18.9	2049	0.770
LAD-SL-PF (Pavillion, US), sandy loam	0.87	8.1	8.11	-	-	18.1	2082	0.777
Geometric mean (if not pH dependent) (n = 10)						54.23	4348	-
Arithmetic mean (if not pH dependent) (n = 10)						-	-	0.682
pH dependence							No	

Soil adsorption transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Soil Type	OC (%)	pH ($CaCl_2$)	pH (H_2O)	K_D (mL/g)	$K_{D, OC}$ (mL/g)	K_F (mL/g)	$K_{F, OC}$ (mL/g)	1/n
RefeSol 02-A Silt	1.18	6.60	7.25	-	-	38.9	3299	0.707
LUFA 2.2 Sandy loam	1.48	5.70	6.33	-	-	41.9	2833	0.752

LUFA 2.3 Sandy loam	0.61	6.20	7.01	-	-	28.7	4709	0.721
LUFA 6S Clay loam	2.07	7.30	7.89	-	-	36.6	1769	0.825
Bourgfelden Silt loam	1.15	7.50	8.41	-	-	23.3	2032	0.713
Wurmwiese Sandy loam	2.00	5.00	5.20	-	-	33.5	1675	0.875
SLI Soil #4, sand	1.34	6.9[1]	7.4	-	-	15.7	1160	0.752
SLI Soil #5, clay loam	0.93	7.1[1]	7.6	-	-	53.9	5650	0.791
Geometric mean (if not pH dependent) (n = 8)						29.8	2541	-
Arithmetic mean (if not pH dependent) (n = 8)						-	-	0.767
pH dependence							No	

[1] Calculated with equation reported in EFSA guidance 2017: $pH_{H2O}=0.982pH_{CaCl2} + 0.648$.

a)

Mobility in soil column leaching active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	No reliable column leaching study, not required
Aged residues leaching	Soil type: sand Aged for: 8d Elution (mm): 200 mm $CaCl_2$ solution over 48 h Leachate: ≤ 0.1 % AR glyphosate Soil (top 6 cm): 69.6-71.8 % AR glyphosate, 24.2-24.6 % AR AMPA

Mobility in soil column leaching transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	No column leaching studies with metabolites submitted, not required

b)

Lysimeter / field leaching studies (Regulation (EU) N° 283/2013, Annex Part A, points 7.1.4.2 / 7.1.4.3 and Regulation (EU) N° 284/2013, Annex Part A, points 9.1.2.2 / 9.1.2.3)

Lysimeter/ field leaching studies	No lysimeter or field leaching studies submitted, not required

Hydrolytic degradation (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.1.1

Hydrolytic degradation of the active substance and metabolites > 10 %	Stable at pH 4, 5, 7 and 9

Aqueous photochemical degradation (Regulation (EU) N° 283/2013, Annex Part A, points 7.2.1.2 / 7.2.1.3)

Photolytic degradation of active substance and metabolites above 10 %	Direct photolysis Stable in sterile distilled water (12 days of continuous irradiation) and in buffer solutions (pH 5, 7 and 9) under natural sunlight Slow degradation in aqueous solutions (pH 5.1, 7.3, 9.2) Metabolite: AMPA (max. after 15 days):16.0 % (pH 5.1) Data gap to determine DT50 Indirect photolysis Rapid degradation in natural water. Data gap to update DT50. Metabolites: AMPA (max. 19.6% after 12 days), methanediol (max. 52% after 12 days)
Quantum yield of direct phototransformation in water at □ > 290 nm	No determination of the quantum yield was performed.

'Ready biodegradability' (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.1)

Readily biodegradable (yes/no)	No

Aerobic mineralisation in surface water (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.1)

Glyphosate							
Suspended sediment test – natural fresh mater	pH water phase	pH sed [a)]	t. °C[b)]	DT_{50} (days) whole sys. (suspended sediment test)	DT_{90} (days) whole sys. (suspended sediment test)	St. (χ^2)	Method of calculation
Calwich Abbey (10 µg/L)	8.2	7.6	20	12.3	41.0	8.4	SFO
Calwich Abbey (95 µg/L)	8.2	7.6	20	21.8	72.4	5.2	SFO

[a)] Measured in water

Mineralisation and non-extractable residues (for parent dosed experiments)					
System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sed	Mineralisation	Non-extractable residues. max *x* % after *n* d (suspended sediment test)	Non-extractable residues. max *x* % after *n* d (end of the study) (suspended sediment test)
Calwich Abbey (10 µg/L)	8.2	7.6	26.5 % after 62 days (end of the study)	14.0 % after 62 days (end of the study)	14.0 % after 62 days (end of the study)

Calwich Abbey (95 µg/L)	8.2	7.6	23.1 after 62 days (end of the study)	9.1 % after 44 days	8.8 % after 62 days (end of the study)

Water / sediment study (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.2)

Glyphosate Trigger endpoints

Glyphosate	Distribution: Max in sediment: 61.4 % after 7 days (system Unter Widdersheim)						
Water / sediment system	**pH water phase**	**pH sed**	**t. (°C)**	**DT_{50} (d)[1]**	**DT_{90} (d)[1]**	**St. (χ^2err) (%)**	**Kinetic model**
Total system							
Cache	8.2	8.1	20	8.4	45.6	2.7	FOMC
Putah	8.4	7.5	20	195.8	902.3	4.4	DFOP
Bickenbach	8.6	7.8	20	15.8	329.4	2.2	HS
Unter Widdersheim	8.6	7.68	20	121.6	>1000	4.8	DFOP
Water phase							
Cache	8.2	8.1	20	5.0	22.7	2.3	DFOP
Putah	8.4	7.5	20	7.9	78.2	10.0	FOMC
Bickenbach	8.6	7.8	20	2.0	22.2	5.2	DFOP
Unter Widdersheim	8.6	7.68	20	1.1	28.7	2.6	DFOP
Sediment phase							
Cache	8.2	8.1	20	33.9	112.6	8.4	SFO
Bickenbach	8.6	7.8	20	158.7	965.3	3.6	DFOP

[1] DT_{50} = $DegT_{50}$ for total system but $DisT_{50}$ for water and sediment phase

Glyphosate Modelling endpoints

Glyphosate						
Total system	pH water phase	pH sed [a)]	t. °C	DT_{50} (days) whole sys.	Model	St. (χ^2)
Cache	8.2	8.1	20	9.7	SFO	5.3
Putah	8.4	7.5	20	301.4[b)]	DFOP	4.4
Bickenbach	8.6	7.8	20	144.4 [b)]	HS	2.2
Unter Widdersheim	8.6	7.68	20	1000	DFOP	4.8
Geometric mean at 20°C				143.3		

[a)] Medium not reported

[b)] Calculated from slow phase degradation rate (k_2) as 10 % of the initial amount was not reached within experimental period

[c)] The estimated degradation rate is not significantly different from zero, default DegT50 of 1000 d to be used

AMPA : trigger endpoints

AMPA	Distribution from parent-dosed experiments:

	Max in water 15.7% after 14 d. Max. sed 18.7 % after 58 d. Max in total system 27.1 % after 30 days Distribution from AMPA-dosed experiments: max. in sediment 63.8% after 30 days								
Study	**Water / sediment system**	**pH water phase**	**pH sed**	**t. (°C)**	**Ffm (-)**	**DT_{50} (d)[1]**	**DT_{90} (d)[1]**	**St. (χ^2err) (%)**	**Kinetic model**
Total system, Level P-I									
[redacted] (2002) CA 7.2.2.3/020	Rückhaltebecken	8.7	7.64	20	-	12.6	>1000	1.6	FOMC
	Schäphysen	8.0	7.34	20	-	2.4	>1000	6.2	DFOP
[redacted] (2003) CA 7.2.2.3/019	Bickenbach	8.5	8.5	20	-	-[2]	-[2]	-[2]	-[2]
	Unter Widdersheim	8.5	8.5	20	-	-[2]	-[2]	-[2]	-[2]
[redacted] (1999) CA 7.2.2.3/021	Bickenbach	8.3	7.4	20	-	43.5	196.8	3.5	DFOP
	Unter Widdersheim	8.2	7.5	20	-	17.7	579.8	3.4	HS
[redacted] (2004) CA 7.2.2.3/018	Manningtree A	7.2	7.6	20	-	-[3]	-[3]	-[3]	-[3]
Total system, Level M-I dissipation									
[redacted] (1999) CA 7.2.2.3/002	Cache[5]	8.2	8.1	20	0.339	172.8	573.9	7.0	SFO
	Putah	8.4	7.5	20	-[5]	-[5]	-[5]	-[5]	-[5]
[redacted] (1993) CA 7.2.2.3/005	Bickenbach	8.6	7.8	20	0.488	15.7	52.2	9.4	SFO
	Unter Widdersheim	8.6	7.68	20	0.321	8.8	29.2	22.4	SFO
Water phase, Level P-I									
[redacted] (2002) CA 7.2.2.3/020	Rückhaltebecken	8.7	7.64	20	-	2.2	22.1	2.1	FOMC
	Schäphysen	8.0	7.34	20	-	1.5	5.1	10.7	SFO
[redacted] (2003) CA 7.2.2.3/019	Bickenbach	8.5	8.5	20	-	2.4	37.1	5.3	FOMC
	Unter Widdersheim	8.5	8.5	20	-	2.1	25.9	8.0	FOMC
[redacted] (1999) CA 7.2.2.3/021	Bickenbach	8.3	7.4	20	-	6.6	50.7	4.5	DFOP
	Unter Widdersheim	8.2	7.5	20	-	2.0	17.3	8.2	DFOP
[redacted] (2004) CA 7.2.2.3/018	Manningtree A	7.2	7.6	20	-	0.6	8.1	1.8	FOMC
Water phase, Level M-I dissipation									
[redacted] (1999) CA 7.2.2.3/002	Cache	8.2	8.1	20	0.339	172.8	573.9	7.0	SFO
	Putah	8.4	7.5	20	-	-[5]	-[5]	-[5]	-[5]
[redacted] (1993) CA 7.2.2.3/005	Bickenbach	8.6	7.8	20	0.488	15.7	52.2	9.4	SFO
	Unter Widdersheim	8.6	7.68	20	0.321	8.8	29.2	22.4	SFO
Sediment phase, Level P-I									
[redacted] (2002) CA 7.2.2.3/020	Rückhaltebecken	8.7	7.64	20	-	168.1	558.3	1.9	SFO
	Schäphysen	8.0	7.34	20	-	-[3]	-[3]	-[3]	-[3]
[redacted] (2003) CA 7.2.2.3/019	Bickenbach	8.5	8.5	20	-	-[2]	-[2]	-[2]	-[2]
	Unter Widdersheim	8.5	8.5	20	-	-[2]	-[2]	-[2]	-[2]
[redacted] (1999) CA 7.2.2.3/021	Bickenbach	8.3	7.4	20	-	-[4]	-[4]	-[4]	-[4]
	Unter Widdersheim	8.2	7.5	20	-	-[3]	-[3]	-[3]	-[3]

[redacted] (2004) CA 7.2.2.3/018	Manningtree A	7.2	7.6	20	-	-[4]	[4]	-[4]	-[4]

[1] DT_{50} = $DegT_{50}$ for total system but $DisT_{50}$ for water and sediment phase
[2] The data of the sediment phase and the total system were not considered in the kinetic evaluation
[3] No acceptable fits obtained and no endpoints could be derived
[4] No evaluations could be conducted for the sediment phase due to the limited number of data points available after the peak concentration
[5] No evaluations could be conducted for any compartment at Level M-I dissipation due to the limited number of data points available after the peak concentration

AMPA: modelling endpoints

Study	Water / sediment system	pH water phase	pH sed	t. (°C)	Model	Ffm from parent (-)	SFO DT_{50} (d)[1]	St. (χ^2err) (%)
Total system, Level P-I								
[redacted] (2002) CA 7.2.2.3/020	Rückhaltebecken	8.7	7.64	20	DFOP	-	95.0[2]	3.8
	Schäphysen	8.0	7.34	20	DFOP	-	1000[3]	6.2
[redacted] (2003) CA 7.2.2.3/019	Bickenbach	8.5	8.5	20	-[4]	-	-[4]	-[4]
	Unter Widdersheim	8.5	8.5	20	-[4]	-	-[4]	-[4]
[redacted] (1999) CA 7.2.2.3/021	Bickenbach	8.3	7.4	20	SFO	-	47.7	5.9
	Unter Widdersheim	8.2	7.5	20	HS	-	288.8[2]	3.4
[redacted] (2004) CA 7.2.2.3/018	Manningtree A	7.2	7.6	20	-[5]	-	-[5]	-[5]
Total system, Level M-I dissipation								
[redacted] (1999) CA 7.2.2.3/002	Cache	8.2	8.1	20	SFO	0.339	172.8	7.0
	Putah	8.4	7.5	20	-[6]	-[6]	-[6]	-[6]
[redacted] (1993) CA 7.2.2.3/005	Bickenbach	8.6	7.8	20	SFO	0.488	26.8[7]	7.9
	Unter Widdersheim	8.6	7.68	20	SFO	0.321	15.1[7]	5.8
Geometric mean (total system) (n = 7, derived from Level P-I and M-I dissipation)							**98.7**	

[1] DT_{50} = $DegT_{50}$ for total system but $DisT_{50}$ for water and sediment phase
[2] Calculated from slow phase degradation rate (k_2) as 10 % of the initial amount was not reached within experimental period
[3] The estimated degradation rate is not significantly different from zero, default $DegT_{50}$ of 1000 d to be used
[4] The data of the sediment phase and the total system were not considered in the kinetic evaluation
[5] No acceptable fits obtained and no endpoints could be derived
[6] No evaluations could be conducted for any compartment at Level M-I dissipation due to the limited number of data points available after the peak concentration
[7] Since AMPA was not detected in sediment in the study, evaluations at Level M-I dissipation were performed for the water phase only, which are also applicable for total system

HMPA: trigger and modelling endpoints

Metabolite HMPA (from glyphosate dosed experiments)								
Water / sediment system	**Distribution:** Max in water: 10.0 % at 61 DAT (system Bickenbach) Max in total system: 10 % at 61 DAT (system Bickenbach)							
	pH water phase	**pH sed**	**t. (°C)**	**$DegT_{50}$ (d)**	**$DegT_{90}$ (d)**	**Formation fraction (-)**	**St. (χ^2err) (%)**	**Model**
Bickenbach	8.6	7.8	20	128.8	427.8	0.366 (from AMPA)	20.5	SFO
Unter Widdersheim	8.6	7.68	20	10	33.4	0.359 (from AMPA)	39.3	SFO

Mineralisation and non extractable residues (from parent dosed experiments)					
Water / sediment system	pH water phase	pH sed	Mineralisation x % after n d. (end of the study).	Non-extractable residues in sed. max x % after n d	Non-extractable residues in sed. max x % after n d (end of the study)
Cache	8.2	8.1	48.0 (100 d)	13.5 (58 d)	13.5 (58 d)
Putah	8.4	7.5	5.9 (100 d)	20.3 (58 d)	16.7 (100 d)
Bickenbach	8.6	7.8	20.2 (61 d)	22.0 (100 d)	22.0 (100 d)
Unter Widdersheim	8.6	7.68	19.4 (61 d)	13.6 (100 d)	13.6 (100 d)

Fate and behaviour in air (Regulation (EU) N° 283/2013, Annex Part A, point 7.3.1)

Direct photolysis in air	Not studied - no data requested
Photochemical oxidative degradation in air	DT_{50} of 1.625 hours derived by the Atkinson model (AOPWIN™ 1.92a). OH (12 h) concentration assumed = 1.5 x 10^6 radicals/cm³
Volatilisation	from plant surfaces (BBA guideline): negligible after 24 hours (n=3)
	from soil surfaces (BBA guideline):): negligible after 24 hours (n=2)
Metabolites	-

Residues requiring further assessment (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.1)

Environmental occurring residues requiring further assessment by other disciplines (toxicology and ecotoxicology) and or requiring consideration for groundwater exposure	Soil: Glyphosate, AMPA Surface water: Glyphosate, AMPA, HMPA Sediment: Glyphosate, AMPA, 1-oxo-AMPA Ground water: Glyphosate, AMPA Air: Glyphosate

Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2)

	See section 5, Ecotoxicology

Monitoring data, if available (Regulation (EU) N° 283/2013, Annex Part A, point 7.5

Soil (indicate location and type of study)	Public monitoring data DE: 57 samples from 29 sites from the German federal state of Brandenburg Detection above LOQ: ~ 30 % of samples for glyphosate, in ~86% of samples for AMPA. Maximum concentration 25 mg/kg for GLY and 0.975 mg/kg for AMPA (depth unknown) EU wide data from LUCAS topsoil project: 317 samples Detection above LOQ: ~ 21 % of samples for glyphosate, in ~ 42 % of samples for AMPA. Maximum concentration 2.05 mg/kg for GLY and 1.92 mg/kg for AMPA (15/20 cm depth), associated with vineyard.
Surface water (indicate location and type of study)	Public monitoring data, EU wide > 291 000 samples from > 13 800 sampling sites for glyphosate > 269 000 samples collected from > 12 400 sampling sites for AMPA Detection above LOQ: ~ 40 % of samples for glyphosate, in ~ 64 % of samples for AMPA. Compliance with RAC and EQS > 99 % of samples for both glyphosate and AMPA. Maximum concentration to be confirmed pending additional data on outlier exclusion procedure.
Ground water (indicate location and type of study)	Public monitoring data, EU wide > 251 000 samples from > 37 800 sampling sites for glyphosate > 230 000 samples from > 34 400 sampling sites for AMPA Detection above LOQ: ~ 2 % of samples for glyphosate, in ~ 2.9 % of samples for AMPA. Compliance with threshold of 0.1 µg/L: > 99 % for both glyphosate and AMPA. Compliance with threshold of 10 µg/L: > 99.99 % for AMPA. Maximum concentration 39.2 µg/L for GLY and 19 µg/L for AMPA
Air (indicate location and type of study)	No EU wide data available Data from FR exploratory pesticide campaign: from June 2018 to June 2019, on 8 sites (3 urban/peri-uban areas and 5 rural areas) with different agricultural profiles

Glyphosate quantified in 56% of the analyses (LOQ 0.009 ng/m^3). Maximum concentration for glyphosate: 1.225 ng/m3, 95th percentile concentration is 0.088 ng/m3 AMPA quantified in 1.3% of the analyses (LOQ 0.009 ng/m^3).

PEC soil (Regulation (EU) N° 284/2013, Annex Part A, points 9.1.3 / 9.3.1)

Parent Method of calculation	Kinetics: DFOP (k_1: 0.0551 day^{-1}; k_2: 0.0017 day^{-1}; g: 0.9420) Field or Lab: representative worst case from field (Ontario site) ESCAPE 2.0
Application data	Crop: all uses (risk envelope approach) Depth of soil layer: 5cm (for plateau, 5 cm for railway uses and perennial crops; 5 and 20cm for field crops) Soil bulk density: 1.5g/cm^3 % plant interception: no interception Number of applications: 1 Interval (d): - Application rate(s): 3600 g a.s./ha (railway uses) 2880 g a.s./ha (perennial crops) 2160 g a.s./ha (field crops)

3600 g a.s./ha (railway uses)

PEC$_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	4.800			
Plateau concentration	0.323 mg/kg on 5 cm			
PECaccumulation	5.123 mg/kg (background on 5 cm)			

2880 g a.s./ha (perennial crops)

PEC$_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	3.840			
Plateau concentration	0.259 mg/kg on 5 cm			
PECaccumulation	4.099 mg/kg (background on 5 cm)			

2160 g a.s./ha (field crops)

$PEC_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	2.880			
Plateau concentration	0.194 mg/kg on 5 cm 0.049 mg/kg on 20 cm			
PECaccumulation	3.074 mg/kg (background on 5 cm) 2.929 mg/kg (background on 20 cm)			

AMPA Method of calculation	Molecular weight relative to the parent: 111.04/169.1 DT_{50} (d): 1040 days Kinetics: SFO Field or Lab: representative worst case from laboratory Max occurrence from lab and field studies: 46.9% ESCAPE 2.0
Application data	Application rate assumed (applied as parent in ESCAPE, application rate of glyphosate corrected for molar ratio and maximum occurrence): 1109 g AMPA/ha (railway uses) 887 g AMPA/ha (uses on perennial crops) 665 g AMPA/ha (uses on field crops)

3600 g a.s./ha (railway uses)

$PEC_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	1.478			
Plateau concentration	5.367 mg/kg on 5 cm			
PECaccumulation	6.845 mg/kg (background on 5 cm)			

2880 g a.s./ha (perennial crops)

$PEC_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	1.182			
Plateau concentration	4.293 mg/kg on 5 cm			
PECaccumulation	5.476 mg/kg (background on 5 cm)			

2160 g a.s./ha (field crops)

$PEC_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial	0.887			
Plateau concentration	3.217 mg/kg on 5 cm 0.804 mg/kg on 20 cm			
PECaccumulation	4.104 mg/kg (background on 5 cm) 1.691 mg/kg (background on 20 cm)			

PEC ground water (Regulation (EU) N° 284/2013, Annex Part A, point 9.2.4.1)

As a first informative estimation of PECgw for the peer review, PECgw for agricultural uses were recalculated by the RMS for two application patterns: an example for perennial crops (Apple, 1x2880 g/ha, application on October 1st) and an example for field crops (Potatoes, 1x2160 g/ha, application 7 days after harvest). Details are provided below. **A data gap is set for the applicant to provide updated PECgw calculations for all intended uses considering the application schemes initially proposed, the endpoints agreed during the peer review and all relevant models.**

Method of calculation and type of study (*e.g.* modelling, field leaching, lysimeter)	FOCUS Modelling Models used: FOCUS PEARL 4.4.4, FOCUS PELMO 5.5.3; Crops: apple, potatoes All relevant FOCUSgw scenarios simulated ***Glyphosate***: Molar mass (g/mol): 169.1 Crop uptake factor: 0 Water solubility (mg/L): 100 000 at 20 °C, 200 000 at 30 °C Vapour pressure: PEARL: 1.31×10^{-5} (25 °C) / PELMO: 6.81×10^{-6} (20 °C) / 2.72×10^{-5} (30 °C) Normalised DT_{50}: Degradation is pH dependent and biphasic. 2 sets of simulations are performed, each including parent and metabolite. ***First set of simulations***: DT_{50}: 0.1d (minimum fast phase normalized DT_{50}, from laboratory - pathway fits – and field, n=12) ***Second set of simulations***: DT_{50}: 161.1 days (maximum slow phase normalized DT_{50}, from laboratory - pathway fits – and field, n=12) K_{OC}/K_{om}: 4348 / 2522 (geometric mean, n = 10) 1/n: 0.682 (arithmetic mean, n = 10) ***AMPA*** Molar mass (g/mol): 111.04 Crop uptake factor: 0 Water solubility (mg/L): 100 000 at 20 °C (parent data) Vapour pressure: 1.31×10^{-5} (25 °C) (parent data) Normalized DT_{50}: **1040 d (max laboratory normalized DT50, SFO, n=10, to take into account pH-dependence)** K_{OC}/K_{om}: 2541 / 1474 (geometric mean, n = 8) 1/n: 0.767 (arithmetic mean, n = 8) Formation fraction : 0.290 from glyphosate (mean laboratory studies, n=7) Modelling for application to railways: Model used: HardSPEC 1.4.3.2

	Glyphosate: Molar mass (g/mol): 169.1 Water solubility (mg/L): 100 000 Soil DT_{50}: 161.1 days (max normalized DT50 from parent-only fits, n=12, to take into account pH-dependence) K_{OC}/K_{om}: 4348 / 2522 (geometric mean, n = 10) ***Metabolite AMPA:*** Molar mass (g/mol): 111.04 Water solubility (mg/L): 100 000 (parent data) Soil DT_{50}: 1040 (max laboratory normalized DT50, n=10, to take into account pH-dependence) K_{OC}/K_{om}: 2541 / 1474 (geometric mean, n = 8)
Application rate	<u>FOCUS calculations</u> Gross application rate: 2880 g/ha on apple 2160 g/ha on potatoes Canopy interception 0 %: No. of applications: 1 Time of application (absolute or relative application dates): Apple: absolute application on October 1st Potatoes: relative application, 7 days after harvest
	<u>HardSPEC calculations</u>: Gross application rate (g a.s./ha): 3600 For AMPA, parent rate was corrected for molecular ratio only (2364 g AMPA/ha)

FOCUS calculations

PEC_{gw} of glyphosate and AMPA (FOCUS PEARL and FOCUS PELMO)

Crop	Scenario	Glyphosate (µg/L)		AMPA (µg/L)	
		parent DT_{50} = 0.1 days	**parent DT_{50} = 161.2 days**	**parent DT_{50} = 0.1 days**	**parent DT_{50} = 161.2 days**
Apple 1st October (1 × 2880 g a.s./ha)	All relevant FOCUS scenarios	<0.001	<0.001	<0.001	<0.001
Potatoes 7 d after harvest (1 x 2160 g a.s./ha	All relevant FOCUS scenarios	<0.001	<0.001	<0.001	<0.001

HardSPEC calculations

PECgw of glyphosate and AMPA – 1 x 3600 g/ha on railways

	Glyphosate			AMPA		
Average annual concentration at the base of the railway formation (µg/L)	0.01			0.01		
	Exposure at the abstraction well-head					
	Glyphosate			**AMPA**		
	Chalk	**Limestone**	**Sandstone**	**Chalk**	**Limestone**	**Sandstone**
Max. concentration in well (µg/L)	<0.001	<0.001	<0.001	0.028	0.006	0.007
Period when plume in well >0.1 µg/L (d)	0	0	0	0	0	0

PEC surface water and PEC sediment (Regulation (EU) N° 284/2013, Annex Part A, points 9.2.5 / 9.3.1)

FOCUS calculations

As a 1st informative estimation of PECsw for the peer review, PECsw for agricultural uses were recalculated by the RMS for the expected worst-case application pattern. Details are provided below. **A data gap is set for the applicant to provide updated PECsw calculations for all intended uses considering the application schemes initially proposed, the endpoints agreed during the peer review and all relevant models.**

Parent Parameters used in FOCUSsw step 1 and 2	Version control no. of FOCUS calculator: FOCUS Step 1-2 v. 3.2 Molecular weight (g/mol): 169.1 K_{OC}/K_{OM} (mL/g): 4348 / 2522 (geometric mean, n = 10) DT_{50} soil (d): 161.1 days (maximum modelling normalized DT_{50}, from laboratory – parent-only fits - and field, n = 12, to take into account pH-dependence) DT_{50} water/sediment/system (d): 143.3 (geometric mean, total system, n = 4)
Parameters used in FOCUSsw step 3 (if performed)	Not performed by RMS
Application rate	Crop and growth stage: potatoes (used as surrogate for modelling suitable drift values for herbicide application on orchards, vines and field crops) Number of applications: 2 Interval (d): 28 Application rate(s): 1440 g a.s./ha Crop interception (%) :no interception Application window: Northern Europe, October-February (worst-case)

FOCUS STEP 1 Scenario	Day after overall maximum	PEC_{SW} (µg/L)		PEC_{SED} (µg/kg)	
		Actual	TWA	Actual	TWA
	0 h	167.72		6280	

FOCUS STEP 2	Day after	PEC_{SW} (µg/L)*	PEC_{SED} (µg/kg)*

Scenario	overall maximum	Actual	TWA	Actual	TWA
Northern EU	0 h	69.95 (37.44)		2970	

* Values in brackets refer to single application / no values in brackets when not calculated by the model

Metabolite AMPA Parameters used in FOCUSsw step 1 and 2	Molecular weight (g/mol): 111.04 Soil and water metabolite Koc/Kom (mL/g): 2541 (geometric mean, n = 8) DT_{50} soil (d): 1040 (max laboratory normalized DT_{50}, n=10, to take into account pH-dependence) DT_{50} water/sediment/ system (d): 98.7 (geometric mean, total system, n = 7) Maximum occurrence observed (% molar basis with respect to the parent) Total Water and Sediment: 27.1 Soil: 46.9
Application rate	Crop and growth stage: potatoes (used as surrogate for modelling suitable drift values for herbicide application on orchards, vines and field crops) Number of applications: 2 Interval (d): 28 Application rate(s): 1440 g a.s./ha Crop interception (%) :no interception Application window: Northern Europe, October-February (worst-case)

FOCUS STEP 1 Scenario	Day after overall maximum	PEC_{SW} (µg/L)		PEC_{SED} (µg/kg)	
		Actual	TWA	Actual	TWA
	0h	111.02		2710	

FOCUS STEP 2 Scenario	Day after overall maximum	PEC_{SW} (µg/L)*		PEC_{SED} (µg/kg)*	
		Actual	TWA	Actual	TWA
Northern EU	0 h	52.47 (27.08)		1320 (681.83)	

* Values in brackets refer to single application

Metabolite HMPA Parameters used in FOCUSsw step 1 and 2	Molecular weight (g/mol): 112.02 Water metabolite Koc/Kom (mL/g): 10 (default value) DT50 soil (d): - DT50 water/sediment/ system (d): 1000 (FOCUS default) Maximum occurrence observed (% molar basis with respect to the parent) Total Water and Sediment: 10 Soil: 0
Application rate	Crop and growth stage: potatoes (used as surrogate for modelling suitable drift values for herbicide application on orchards, vines and field crops) Number of applications: 2 Interval (d): 28 Application rate(s): 1440 g a.s./ha Crop interception (%): no interception Application window: Northern Europe, October-February (worst-case)

FOCUS STEP 1 Scenario	Day after overall maximum	PEC_{SW} (µg/L)		PEC_{SED} (µg/kg)	
		Actual	TWA	Actual	TWA
	0h	58.06		57.82	

FOCUS STEP 2 Scenario	Day after overall maximum	PEC_{SW} (µg/L)*		PEC_{SED} (µg/kg)*	
		Actual	TWA	Actual	TWA
Northern EU	0 h	52.47 (27.08)		1320 (681.83)	

* Values in brackets refer to single application

HardSPEC calculations

Parent Parameters used in HardSPEC	Version 1.4.3.2 Molecular weight (g/mol): 169.1 Water solubility (mg/L): 100 000 K_{OC}/K_{OM} (mL/g): 4348 / 2522 (geometric mean, n = 10) DT_{50} soil (d): 161.1 days (max normalized DT_{50} laboratory - parent only fits - and field, n=12, to take into account pH-dependence) DT_{50} water/sediment (d): 143.3 (geometric mean, total system, n = 4)
Application rate	Use: Railway Number of applications: 1 Interval (d): - Application rate(s): 3600 g a.s./ha

Crop interception (%): no interception

	Acute (24 hrs) concentration		Application day PECsw from spray drift (µg L^{-1})
	Water phase (ug L^{-1})	Sediment phase (ug kg^{-1})	
Railway ditch leaching	9.458	34.240	9.458
Railway ditch runoff	9.458	34.781	9.458

Metabolite AMPA Parameters used in HardSPEC	Molecular weight (g/mol): 111.04 Soil and water metabolite Koc/Kom (mL/g): 2541 (geometric mean, n = 8) DT_{50} soil (d): 1040 (max laboratory normalized DT_{50}, n=10, to take into account pH-dependence) DT_{50} water/sediment/ system (d): 98.7 (geometric mean, total system, n = 7)
Application rate	Use: Railway Number of applications: 1 Interval (d): - Application rate: 3600 g a.s./ha (corrected for molar ratio of 111.04/169.1, metabolite applied as parent substance)

	Acute (24 hrs) concentration		Application day PECsw from spray drift (µg L^{-1})
	Water phase (ug L^{-1})	Sediment phase (ug kg^{-1})	
Railway ditch leaching	6.210	18.390	6.210
Railway ditch runoff	6.210	19.469	6.210

Metabolite HMPA Parameters used in HardSPEC	Railway use PECsw estimated from HardSPEC PECsw of glyphosate, corrected for molar ratio (112.02/169.1) and maximum occurrence in water (10%)

	Acute (24 hrs) concentration		Application day PECsw from spray drift (µg L^{-1})
	Water phase (ug L^{-1})	Sediment phase (ug kg^{-1})	
Railway ditch leaching	0.627	-	0.627
Railway ditch runoff	0.627	-	0.627

Estimation of concentrations from other routes of exposure (Regulation (EU) N° 284/2013, Annex Part A, point 9.4)

Method of calculation	No data, not required

PEC

Maximum concentration	No data, not required

Ecotoxicology

Effects on birds and other terrestrial vertebrates (Regulation (EU) N° 283/2013, Annex Part A, point 8.1 and Regulation (EU) N° 284/2013, Annex Part A, point 10.1)

Species	Test substance	Time scale	End point	Toxicity (mg a.e./kg bw per day)
Birds				
Colinus virginianus	Glyphosate K- salt	Acute oral	LD_{50}	> 2241
Colinus virginianus	Glyphosate acid	Acute oral	LD_{50}	> 2000
Colinus virginianus	Glyphosate technical	Acute oral	LD_{50}	> 2000
Colinus coturnis japonica	Glyphosate technical	Acute oral	LD_{50}	> 2000
Colinus coturnis japonica	Glyphosate technical	Acute oral	LD_{50}	> 2000
Anas platyrhynchos	Glyphosate technical	Acute oral	LD_{50}	> 2000
Anas platyrhynchos	Glyphosate technical	Acute oral	LD_{50}	> 2000
All birds[1]	a.s.	Acute oral	LD_{50}	**4334**
	Preparation	Acute oral	LD_{50}	No data
Colinus virginianus	AMPA	Acute oral	LD_{50}	> 2250
Colinus virginianus	Glyphosate acid	Short term	LDD_{50}	>1511
Anas platyrhynchos	Glyphosate acid	Short term	LDD_{50}	>1715
Colinus virginianus	Glyphosate acid	Long term	NOEC/NOEL	2250 mg a.e./kg feed 201 mg a.e./kg bw d^{-1}
Anas platyrhynchos	Glyphosate acid	Long term	NOEC/NOEL	1000 mg a.e./kg feed **116** mg a.e./kg bw d^{-1}
Anas platyrhynchos	Glyphosate technical	Long term	NOEC/NOEL	1000 mg a.e./kg feed 125 mg a.e./kg bw d^{-1}
Mammals				
Rat and mouse	Glyphosate acid	Acute [for screening step]	LD_{50}	>2000
All mammals[2]	Glyphosate acid	Acute [for Tier 1]	LD_{50}	**3447**
Rat	Preparation	Acute	LD_{50}	>5000
Rat and mice	AMPA	Acute	LD_{50}	>5000

Rabbit	Glyphosate technical	Long-term [for screening step]	NOAEL	50
Rabbit	Glyphosate technical	Long-term [for Tier 1 and 2 risk assessment]	NOAEL	**100**
	AMPA	Long-term	NOAEL	150
Endocrine disrupting properties (Annex Part A, points 8.1.5) An amphibian metamorphosis assay (AMA) is available. No indications on endocrine activity were observed.				
Additional higher tier studies (Annex Part A, points 10.1.1.2): Refinements of residue decline in plants were proposed but not sufficiently supported by available information.				
Terrestrial vertebrate wildlife (birds, mammals, reptile and amphibians) (Annex Part A, points 8.1.4, 10.1.3): <u>Birds</u> One study from the open literature was considered relevant for the risk assessment. The study was performed on *Coturnix japonica* and generated a chronic LOEC of 164 mg a.s,/kg food for flight feather moult in females and plumage development in all juveniles. <u>Amphibians</u> 8 studies from the open literature were considered relevant for the risk assessment (and 16 less relevant, but supplementary, to be used in a WoE). For the relevant studies, the 96 h LC_{50} for embryos and tadpoles of 5 different taxa ranged 106 mg/L to >403 mg/L for glyphosate technical and 7.04 mg a.i./L to 446 mg a.e./L for preparations.				

1 All acute oral bird studies resulted in endpoints > 2000 mg/kg bw (see Section CA 8.1.1.1). Therefore an extrapolation factor of 2.167 as recommended in the Guidance Document on Risk Assessment for Birds and Mammals (EFSA Journal 2009; 7(12): 1438) was applied.

2 Geomean approach based on available data.

Toxicity/exposure ratios for terrestrial vertebrates (Regulation (EU) N° 284/2013, Part A, Annex point 10.1)

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 6 a-b, 10 a-c **1 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Grassland	Large herbivorous birds	Acute	43.9	98.7	10
Bare soil	Small granivorous birds	Acute	35.6	122.0	10
Bulb and onion like crops	Small omnivorous birds	Acute	229	19.0	10

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 6 a-b, 10 a-c **1 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Grassland	Large herbivorous birds	Long-term	12.4	9.4	5
Bare soil	Small granivorous birds	Long-term	8.70	13.3	5
Bulb and onion like crops	Small omnivorous birds	Long-term	49.5	**2.3**	5
Tier 1 (Birds)					
Leafy vegetables BBCH 10-49	Small granivorous bird "finch" Serin (*Serinus serinus*)	Long-term	9.62	12.1	5
Leafy vegetables BBCH ≥ 50	Small granivorous bird "finch" Serin (*Serinus serinus*)	Long-term	2.90	40.0	5
Leafy vegetables BBCH 10-49	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	8.32	13.9	5
Leafy vegetables BBCH ≥ 50	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	2.52	46.0	5
Leafy vegetables Leaf development BBCH 10-19	Medium herbivorous/ granivorous bird "pigeon" Wood pigeon (*Columba palumbus*)	Long-term	17.3	6.7	5
Leafy vegetables BBCH 10-19	Small insectivorous bird "wagtail" Yellow wagtail (*Motacilla flava*)	Long-term	8.62	13.5	5
Leafy vegetables BBCH ≥ 20	Small insectivorous bird "wagtail" Yellow wagtail (*Motacilla flava*)	Long-term	7.40	15.7	5
Maize BBCH ≥ 40	Medium granivorous bird "gamebird" Partridge (*Perdix perdix*)	Long-term	0.612	190	5
Maize BBCH 10-29 (to cover birds that visit the fields and consume treated grasses and weeds)	Medium herbivorous/granivorous bird "pigeon" Wood pigeon (*Columba palumbus*)	Long-term	17.3	6.7	5

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 6 a-b, 10 a-c **1 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Maize BBCH ≥ 40	Medium herbivorous/ granivorous bird "pigeon" Wood pigeon (*Columba palumbus*)	Long-term	4.35	26.7	5
Oilseed rape Late (with seeds) BBCH 30-99	Small insectivorous bird "dunnock" Dunnock (*Prunella modularis*)	Long-term	2.06	56.3	5
Oilseed rape Late (with seeds) BBCH 80-99	Small granivorous bird "finch" Linnet (*Carduelis cannabina*)	Long-term	8.70	13.3	5
Bulbs and onion like crops BBCH ≥ 20	Small insectivorous bird "wagtail" Yellow wagtail (*Motacilla flava*)	Long-term	7.40	15.7	5
Bulbs & onion like crops BBCH ≥ 40	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	4.96	19.4	5
Cereals Late season-Seed heads	Small granivorous/ insectivorous bird "bunting" Yellowhammer (*Emberiza citronella*)	Long-term	3.59	32.3	5
Sunflower Late (Flowering, seed ripening) BBCH 61-92	Small granivorous/ insectivorous bird 'bunting' Yellowhammer (*Emberiza citronella*)	Long-term	7.63	15.2	5
Bulbs and onion like crops BBCH 10-19	Small insectivorous bird "wagtail" Yellow wagtail (*Motacilla flava*)	Long-term	6.47	17.9	5
Bulbs & onion like crops BBCH 10-39	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	6.24	18.6	5
Leafy vegetables BBCH 10-49	Small granivorous bird "finch" Serin (*Serinus serinus*)	Long-term	7.21	16.1	5

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 6 a-b, 10 a-c **1 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Leafy vegetables Leaf development BBCH 10-19	Medium herbivorous/ granivorous bird "pigeon" Wood pigeon (*Columba palumbus*)	Long-term	13.0	8.9	5

The use of glyphosate in orchards: Uses 4 a-c **2 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Orchard	Small insectivorous birds	Acute	74.1	58.5	10
Orchard	Small insectivorous birds	Long-term	15.3	7.6	5
Tier 1 (Birds)					
Not required	-	-	-	-	-

The use of glyphosate in vineyards: Uses 5 a-c **2 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Vineyard	Small omnivorous birds	Acute	151.0	28.7	10
Vineyard	Small omnivorous birds	Long-term	32.7	**3.55**	5
Tier 1 (Birds)					
Vineyard BBCH 10-19	Small insectivorous bird "redstart" Black Redstart (*Phoenicurus ochrurus*)	Long-term	9.65	12.0	5
Vineyard BBCH 20-39	Small insectivorous bird "redstart" Black Redstart (*Phoenicurus ochrurus*)	Long-term	8.31	14.0	5
Vineyard BBCH 10-19	Small granivorous bird "finch" Linnet (*Carduelis cannabina*)	Long-term	5.79	20.0	5

The use of glyphosate in vineyards: Uses 5 a-c **2 × 1440 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Vineyard BBCH 20-39	Small granivorous bird "finch" Linnet (*Carduelis cannabina*)	Long-term	4.79	24.2	5
Vineyard BBCH ≥ 40	Small granivorous bird "finch" Linnet (*Carduelis cannabina*)	Long-term	2.85	40.7	5
Vineyard BBCH 10-19	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	5.46	21.2	5
Vineyard BBCH 20-39	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	4.53	25.6	5
Vineyard BBCH ≥ 40	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	2.77	41.9	5

The use of glyphosate on railroad tracks: Uses 7a-b **2 × 1800 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Grassland	Large herbivorous birds	Acute	54.9	78.9	10
Bare soil	Small granivorous birds	Acute	44.5	97.5	10
Grassland	Large herbivorous birds	Long-term	15.5	7.5	5
Bare soil	Small granivorous birds	Long-term	10.9	10.6	5
Tier 1 (Birds)					
Not required	-	-	-	-	-

The use of glyphosate in agricultural and non-agricultural areas to control invasive species: Uses 8, 9 **1 × 1800 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger

The use of glyphosate in agricultural and non-agricultural areas to control invasive species: Uses 8, 9 **1 × 1800 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Grassland	Large herbivorous birds	Acute	54.9	78.9	10
Bare soil	Small granivorous birds	Acute	44.5	97.5	10
Bulb and onion like crops	Small omnivorous birds	Acute	286	15.2	10
Grassland	Large herbivorous birds	Long-term	15.5	7.5	5
Bare soil	Small granivorous birds	Long-term	10.9	10.6	5
Bulb and onion like crops	Small omnivorous birds	Long-term	61.8	**1.9**	5
Tier 1 (Birds)					
Cereals Early (shoots) autumn-winter BBCH 10 - 29	Large herbivorous bird "goose" Pink-foot goose (*Anser brachyrhynchus*)	Long-term	15.5	7.5	5
Maize BBCH 10-29	Medium granivorous bird "gamebird" Partridge (*Perdix perdix*)	Long-term	2.86	40.6	5
Leafy vegetables BBCH 10-19	Medium herbivorous/granivorous bird "pigeon" Wood pigeon (*Columba palumbus*)	Long-term	21.7	5.3	5
Leafy vegetables BBCH 10-49	Small granivorous bird "finch" Serin (*Serinus serinus*)	Long-term	12.0	9.7	5
Oilseed rape Late (with seeds) BBCH 30-99	Small insectivorous bird "dunnock" Dunnock (*Prunella modularis*)	Long-term	2.58	45.0	5
Hops BBCH 10-19	Small insectivorous bird "finch" Chaffinch (*Fringilla coelebs*)	Long-term	8.68	13.4	5

The use of glyphosate in agricultural and non-agricultural areas to control invasive species: Uses 8, 9 **1 × 1800 g/ha**					
Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Cereals Late post-emergence (May-June) BBCH 71 - 89	Small insectivorous bird "passerine" Fan tailed warbler	Long-term	21.4	5.4	5
Cereals Early autumn-winter BBCH 10-29	Large herbivorous bird "goose" Pink-foot goose (*Anser brachyrhynchus*)	Long-term	15.5	7.5	5
Orchards Spring Summer	Small insectivorous bird "tit" Bluetit (*Parus caeruleus*)	Long-term	17.4	6.7	5
Bulbs and onion like crops BBCH 10-19	Small insectivorous bird "wagtail" Yellow wagtail (*Motacilla flava*)	Long-term	10.8	10.7	5
Bush and cane fruit. Whole season BBCH 00-79 Currants	Small insectivorous bird "warbler" Willow warbler (*Phylloscopus trochilus*)	Long-term	19.4	6.0	5
Vineyard BBCH 10-19	Small insectivorous bird "redstart" Black redstart (*Phoenicurus ochruros*)	Long-term	11.0	10.5	5
Maize Leaf development BBCH 10-19	Small insectivorous / worm feeding species "thrush" Robin (*Erithacus rubecula*)	Long-term	5.44	21.3	5
Bulbs and onion like crops BBCH 10-39	Small omnivorous bird "lark" Woodlark (*Lullula arborea*)	Long-term	10.4	11.2	5
Higher tier (Birds)					
Not needed	-	-	-	-	-

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 10 a-c **1 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Mammals)					
Bare soil	Small granivorous mammal	Acute	20.7	96.6	10
Bulb and onion like crops	Small herbivorous mammal	Acute	170	11.7	10
Fruiting vegetables	Small herbivorous mammal	Acute	196	10.2	10
Bare soil	Small granivorous mammal	Long-term	5.04	9.92	5
Bulb and onion like crops	Small herbivorous mammal	Long-term	36.9	**1.36**	5
Fruiting vegetables	Small herbivorous mammal	Long-term	55.2	**0.91**	5
Tier 1 (Mammals)					
Grassland All season	Large herbivorous mammal "lagomorph" Brown hare (*Lepus europaeus*)	Long-term	13.2	7.58	5
Grassland Late	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Long-term	1.45	69.0	5
Grassland All season	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Long-term	55.2	**1.81**	5
Grassland Late season (seed heads)	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	5.04	19.8	5
Leafy vegetables BBCH 10 - 19	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Long-term	3.21	31.2	5
Leafy vegetables BBCH ≥ 20	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Long-term	1.45	69.0	5

The use of glyphosate in field crops: Uses 1 a-c, 2 a-c, 3 a-b, 10 a-c **1 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Leafy vegetables BBCH 40 - 49	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Long-term	55.2	**1.81**	5
Leafy vegetables BBCH ≥ 50	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Long-term	16.6	6.02	5
Leafy vegetables All season	Large herbivorous mammal "lagomorph" Rabbit (*Oryctolagus cuniculus*)	Long-term	10.9	9.17	5
Leafy vegetables BBCH 10 - 49	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	5.95	16.8	5
Leafy vegetables BBCH ≥ 50	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	1.76	56.8	5
Bulbs and onion like crops BBCH ≥ 20	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Long-term	1.45	69.0	5

The use of glyphosate in field crops: Uses 6 a-b **1 × 1080 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Mammals)					
Bare soil	Small granivorous mammal	Acute	20.7	96.6	10
Bulb and onion like crops	Small herbivorous mammal	Acute	170	11.7	10
Fruiting vegetables	Small herbivorous mammal	Acute	196	10.2	10

The use of glyphosate in field crops: Uses 6 a-b **1 × 1080 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Bare soil	Small granivorous mammal	Long-term	5.04	9.92	5
Bulb and onion like crops	Small herbivorous mammal	Long-term	36.9	**1.36**	5
Fruiting vegetables	Small herbivorous mammal	Long-term	55.2	**0.91**	5
Tier 1 (Mammals)					
Bulbs & onion like crops BBCH 10 – 19	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	2.40	41.7	5
Bulbs & onion like crops BBCH 10 – 39	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	4.46	22.4	5
Fruiting vegetables BBCH 10 – 49	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Long-term	41.4	**2.4**	5
Leafy vegetables All season	Large herbivorous mammal “lagomorph” Rabbit (*Oryctolagus cuniculus*)	Long-term	8.19	12.2	5

The use of glyphosate in field crops: Use 3 a-b **1 × 540 g/ha (best case)**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Mammals)					
Bulbs and onion like crops BBCH ≥ 20	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	0.544	183.8	5
Grassland All season	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	4.95	20.2	5

The use of glyphosate in field crops: Use 3 a-b **1 × 540 g/ha (best case)**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Grassland All season	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Long-term	20.7	**4.83**	5
Grassland Late season (seed heads)	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	1.89	52.9	5

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **2 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Mammals)					
Fruiting vegetables	Small herbivorous mammal	Acute	216	9.3	10
Fruiting vegetables	Small herbivorous mammal	Long-term	60.7	**0.82**	5
Tier 1 (Mammals) geomean acute endpoint					
Orchards Application crop directed BBCH <10 or not crop directed	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Acute	8.55	403	10
Orchards Application crop directed BBCH <10 or not crop directed	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Acute	216	16.0	10
Orchards Application crop directed BBCH <10 or not crop directed	Large herbivorous mammal "lagomorph" Rabbit (*Oryctolagus cuniculus*)	Acute	55.6	62.0	10

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **2 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Orchards Application crop directed BBCH <10 or not crop directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Acute	27.2	126.7	10
Vineyard Application ground directed	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Acute	43.1	80.0	10
Vineyard BBCH 10-19	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Acute	25.8	133.6	10
Vineyard BBCH 20 – 39	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Acute	21.5	160.3	10
Vineyard BBCH ≥ 40	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Acute	12.8	269.3	10
Vineyard BBCH 10 – 19	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Acute	12.0	287.3	10
Vineyard BBCH ≥ 20	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Acute	8.55	403.2	10
Vineyard Application ground directed	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Acute	216	16.0	10
Vineyard Application ground directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Acute	27.2	126.7	10

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **2 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Orchards Application crop directed BBCH <10 or not crop directed	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	1.60	62.5	10
Orchards Application crop directed BBCH <10 or not crop directed	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Long-term	60.7	**1.65**	10
Orchards Application crop directed BBCH <10 or not crop directed	Large herbivorous mammal “lagomorph” Rabbit (*Oryctolagus cuniculus*)	Long-term	12.0	8.33	5
Orchards Application crop directed BBCH <10 or not crop directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	6.55	15.3	5
Vineyard Application ground directed	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	9.32	10.7	5
Vineyard BBCH 10-19	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	5.62	17.8	5
Vineyard BBCH 20 – 39	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	4.62	21.6	5
Vineyard BBCH ≥ 40	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	2.77	36.1	5
Vineyard BBCH 10 – 19	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	3.53	28.3	5

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **2 × 1440 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Vineyard BBCH ≥ 20	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	1.60	62.5	5
Vineyard Application ground directed	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Long-term	60.7	**1.6**	5
Vineyard Application ground directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	6.55	15.3	5

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **1 × 720 g/ha (best case)**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Mammals)					
Orchards Application crop directed BBCH <10 or not crop directed	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	0.725	137.9	5
Orchards Application crop directed BBCH <10 or not crop directed	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Long-term	27.6	**3.62**	5
Orchards Application crop directed BBCH <10 or not crop directed	Large herbivorous mammal “lagomorph” Rabbit (*Oryctolagus cuniculus*)	Long-term	5.46	18.3	5

The use of glyphosate in orchards and vines: Uses 4 a-c, 5 a-c **1 × 720 g/ha (best case)**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Orchards Application crop directed BBCH <10 or not crop directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	2.98	33.6	5
Vineyard Application ground directed	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	4.24	23.6	5
Vineyard BBCH 10-19	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	2.56	39.1	5
Vineyard BBCH 20 – 39	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	2.10	47.6	5
Vineyard BBCH ≥ 40	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	1.26	79.4	5
Vineyard BBCH 10 – 19	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	1.60	62.5	5
Vineyard BBCH ≥ 20	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	0.725	137.9	5
Vineyard Application ground directed	Small herbivorous mammal “vole” Common vole (*Microtus arvalis*)	Long-term	27.6	**3.6**	5
Vineyard Application ground directed	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	2.98	33.6	5

The use of glyphosate in railroad tracks: Uses 7 a-b **1 × 1800 g/ha and 2 × 1800 g/ha, 90 days apart**

Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Mammals)					
Bare soil	Small granivorous mammal	Acute	28.5	77.2	10
Fruiting vegetables	Small herbivorous mammal	Acute	270	**8.13**	10
Bare soil	Small granivorous mammal	Long-term	6.30	7.94	5
Fruiting vegetables	Small herbivorous mammal	Long-term	69.0	**0.72**	5
Tier 1 (Mammals) geomean acute endpoint					
Grassland All season	Large herbivorous mammal "lagomorph" Brown hare (*Lepus europaeus*)	Acute	58.7	58.7	10
Grassland Late	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Acute	9.72	354.6	10
Grassland All season	Small herbivorous mammal "vole" Common vole (*Microtulus arvalis*)	Acute	246	14.0	10
Grassland Late season (seed heads)	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Acute	25.9	133.1	10
Leafy vegetables BBCH 10 - 19	Small insectivorous mammal "shrew" Commnon shrew (*Sorex araneus*)	Acute	13.7	251.6	10
Leafy vegetables BBCH ≥ 20	Small insectivorous mammal "shrew" Commnon shrew (*Sorex araneus*)	Acute	9.72	354.6	10
Leafy vegetables BBCH 40 - 49	Small herbivorous mammal "vole" Common vole (*Microtulus arvalis*)	Acute	246	14.0	10
Leafy vegetables BBCH ≥ 50	Small herbivorous mammal "vole" Common vole (*Microtulus arvalis*)	Acute	73.6	46.8	10

The use of glyphosate in railroad tracks: Uses 7 a-b 1 × 1800 g/ha and 2 × 1800 g/ha, 90 days apart					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Leafy vegetables All season	Large herbivorous mammal “lagomorph” Rabbit (*Oryctolagus cuniculus*)	Acute	63.2	54.5	10
Leafy vegetables BBCH 10 – 49	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Acute	31.0	111.2	10
Leafy vegetables BBCH ≥ 50	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Acute	9.36	368	10
Grassland All season	Large herbivorous mammal “lagomorph” Brown hare (*Lepus europaeus*)	Long-term	16.5	6.1	5
Grassland Late	Small insectivorous mammal “shrew” Common shrew (*Sorex araneus*)	Long-term	1.81	55.2	5
Grassland All season	Small herbivorous mammal “vole” Common vole (*Microtulus arvalis*)	Long-term	69.0	**1.4**	5
Grassland Late season (seed heads)	Small omnivorous mammal “mouse” Wood mouse (*Apodemus sylvaticus*)	Long-term	6.30	15.9	5
Leafy vegetables BBCH 10 - 19	Small insectivorous mammal “shrew” Commnon shrew (*Sorex araneus*)	Long-term	4.01	24.9	5
Leafy vegetables BBCH ≥ 20	Small insectivorous mammal “shrew” Commnon shrew (*Sorex araneus*)	Long-term	1.81	55.2	5
Leafy vegetables BBCH 40 - 49	Small herbivorous mammal “vole” Common vole (*Microtulus arvalis*)	Long-term	69.0	**1.4**	5

The use of glyphosate in railroad tracks: Uses 7 a-b **1 × 1800 g/ha and 2 × 1800 g/ha, 90 days apart**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Leafy vegetables BBCH ≥ 50	Small herbivorous mammal "vole" Common vole (*Microtulus arvalis*)	Long-term	20.7	**4.8**	5
Leafy vegetables All season	Large herbivorous mammal "lagomorph" Rabbit (*Oryctolagus cuniculus*)	Long-term	13.6	7.4	5
Leafy vegetables BBCH 10 – 49	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	7.44	13.4	5
Leafy vegetables BBCH ≥ 50	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	2.19	45.7	5

The use of glyphosate in invasives species: Uses 8 and 9 **1 × 1800 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Mammals)					
Bare soil	Small granivorous mammal	Acute	25.9	77.2	10
Bush and cane fruit	Small herbivorous mammal	Acute	147	13.6	10
Bulbs and onion like crops	Small herbivorous mammal	Acute	213	**9.38**	10
Fruiting vegetables	Small herbivorous mammal	Acute	246	8.13	10
Bare soil	Small granivorous mammal	Long-term	6.30	7.94	5
Bush and cane fruit	Small herbivorous mammal	Long-term	41.4	**1.21**	5
Bulbs and onion like crops	Small herbivorous mammal	Long-term	46.1	**1.09**	5

The use of glyphosate in invasives species: Uses 8 and 9 **1 × 1800 g/ha**					
Crop scenario	Indicator species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Fruiting vegetables	Small herbivorous mammal	Long-term	69.0	**0.72**	5
Tier 1 (Mammals) geomean acute endpoint					
Bulbs & onion like crops BBCH 10 – 19	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Acute	13.7	146	10
Bulbs & onion like crops BBCH 10 – 39	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Acute	31.0	64.6	10
Cereals Early (shoots)	Large herbivorous mammal "lagomorph" Rabbit (*Oryctolagus cuniculus*)	Acute	75.8	26.4	10
Fruiting vegetables BBCH 10 – 49	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Acute	246	**8.15**	10
Bulbs & onion like crops BBCH 10 – 19	Small insectivorous mammal "shrew" Common shrew (*Sorex araneus*)	Long-term	4.01	24.9	5
Bulbs & onion like crops BBCH 10 – 39	Small omnivorous mammal "mouse" Wood mouse (*Apodemus sylvaticus*)	Long-term	7.44	13.4	5
Cereals Early (shoots)	Large herbivorous mammal "lagomorph" Rabbit (*Oryctolagus cuniculus*)	Long-term	21.3	**4.7**	5
Fruiting vegetables BBCH 10 – 49	Small herbivorous mammal "vole" Common vole (*Microtus arvalis*)	Long-term	69.0	**1.4**	5

Risk from bioaccumulation and food chain behaviour

Since the log POW values of glyphosate and AMPA do not esxceed 3 (log POW < -3.2 and -2.47 respectively), formal assessment of the secondary poisoning risk to birds and mammals is not required.
Risk from consumption of contaminated water The leaf scenario does not apply to the proposed uses of MON 52276; water that is collected in leaf whorls after application and applies to leafy vegetables forming heads or with a morphology that facilitates collection of rain / irrigation water sufficiently to attract birds, i.e. for the before named crops at BBCH ≥ 41.
Puddle scenario, Screening step Avian: 1800 / 116 = TER of 15.5 which is less than 50. No further assessment required. Mammal: 1800 / 50 = TER of 36 which is less than 50. No further assessment required.

Toxicity data for all aquatic tested species (Regulation (EU) N° 283/2013, Annex Part A, points 8.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.2)*

* This section does not yet reflect the new EFSA Guidance Document on aquatic organisms which has been noted in the meeting of the Standing Committee on Plants, Animals, Food and Feed on 11 July 2014.

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Laboratory tests				
Fish				
Oncorhynchus mykiss	a.s. (Glyphosate K-salt)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>1193 mg a.e./$L_{(nom)}$ 149 mg a.e./$L_{(nom)}$
Oncorhynchus mykiss	a.s. (Glyphosate acid)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>100 mg a.e./$L_{(nom)}$ 32 mg a.e./$L_{(nom)}$
Oncorhynchus mykiss	a.s. (Glyphosate IPA-salt)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>1001 mg a.e./$L_{(nom)}$ 236 mg a.e./$L_{(nom)}$
Oncorhynchus mykiss	a.s. (Glyphosate technical)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>87.7 mg a.e./$L_{(gmm)}$ 87.7 mg a.e./$L_{(gmm)}$
Salmo gairdneri (Oncorhynchus mykiss)	a.s. (Glyphosate IPA-salt)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>463 mg a.e./$L_{(nom)}$ 1) 463 mg a.e./$L_{(nom)}$ 1)
Salmo gairdneri (Oncorhynchus mykiss)	a.s. (Glyphosate technical)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	71.4 mg a.e./$L_{(nom)}$ 2) 34.9 mg a.e./$L_{(nom)}$ 2)
Lepomis macrochirus	a.s. (Glyphosate	Acute 96 hr (static)	Mortality, LC_{50}	>32 mg a.e./$L_{(nom)}$ 32 mg a.e./$L_{(nom)}$

Group	Test substance acid)	Time-scale (Test type) NOEC	End point	Toxicity[1]
Lepomis macrochirus	a.s. (Glyphosate technical)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>119 mg a.e./$L_{(gmm)}$ 3) 119 mg a.e./$L_{(gmm)}$ 3)
Lepomis macrochirus	a.s. (Glyphosate technical)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	100 < LC_{50} < 140 mg a.e./$L_{(nom)}$ 4) 100 mg a.e./$L_{(nom)}$ 4)
Cyprinus carpio	a.s. (Glyphosate acid)	Acute 96 hr (semi-static)	Mortality, LC_{50} NOEC	>100 mg a.e./$L_{(nom)}$ 100 mg a.e./$L_{(nom)}$
Brachydanio rerio (Danio rerio)	a.s. (Glyphosate technical)	Acute 96 hr (semi-static)	Mortality, LC_{50} NOEC	>123 mg a.e./$L_{(nom)}$ 5) 56 mg a.e./$L_{(nom)}$ 5)
Leuciscus idus	a.s. (Glyphosate IPA-salt)	Acute 96 hr (static)	Mortality, LC_{50} NOEC	>2282 mg a.e./$L_{(nom)}$ 6) 2282 mg a.e./$L_{(nom)}$ 6)
Poecilia reticulata	a.s. (Glyphosate)	Acute 96 hr (static)	Mortality, LC_{50}	68.78 mg a.e./L (male) # 70.87 mg a.e./L (female) #
Cyprinus carpio	a.s. (Glyphosate)	Acute 96 hr (static)	Mortality, LC_{50}	6.75 mg a.e./L #
Oncorhynchus mykiss	AMPA	Acute 96 hr (static)	Mortality, LC_{50}	>100 mg AMPA/$L_{(nom)}$
Oncorhynchus mykiss	AMPA	Acute 96 hr (static)	Mortality, LC_{50}	>180 mg AMPA/$L_{(nom)}$
Poecilia reticulata	AMPA	Acute 96 hr (static)	Mortality, LC_{50}	180 mg AMPA/L (male) # 164.3 mg AMPA/L (female) #
Oncorhynchus mykiss	MON-52276	Acute 96 hr (static)	Mortality, LC_{50}	>989 mg prep./L (>306 mg a.e../$L_{(mm)}$)
Cyprinus carpio	MON-52276	Acute 96 hr (static)	Mortality, LC_{50}	>895 mg prep./L (>277 mg a.e../$L_{(mm)}$)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Brachydanio rerio	a.s. (Glyphosate acid)	Chronic (semi-static)	Mortality and behaviour NOEC	1 mg a.e./$L_{(nom)}$
Danio rerio	a.s. (Glyphosate)	test with zebrafish embryos	Mortality, LC_{50} (96h)	>100 mg a.e./$L_{(nom)}$) #
Danio rerio	a.s. (Glyphosate)	Test with zebrafish embryos.	Mortality, LC_{50} Heart rate EC_{10} Hatching rate EC_{10} Hatching rate EC_{50} Developmental delays EC_{10} Malformations EC_{10}	98.4 mg a.e./$L_{(nom)}$ # 7.27 mg a.e./$L_{(nom)}$ # 26.2 mg a.e./$L_{(nom)}$ # 37.9 mg a.e./$L_{(nom)}$ # 21.3 mg a.e./$L_{(nom)}$ # 30.2 mg a.e./$L_{(nom)}$ #
Danio rerio	a.s. (Glyphosate)	Embryo (5h post fertilisation)	Mortality, LC_{50}	66.04 mg a.e./$L_{(nom)}$ #
Danio rerio	a.s. (Glyphosate)	Early development of larval	Morphological NOEC Surface tension of chorion NOEC Hatching rate NOEC Larvae abnormality	10 mg a.e./$L_{(nom)}$ # < 1 mg a.e./$L_{(nom)}$ # 200 mg a.e./$L_{(nom)}$ # 10 mg a.e./$L_{(nom)}$ #
Pimephales promelas	a.s. (glyphosate acid)	Chronic, 255 d FFLC, flow-through	Survival, growth, reproduction NOEC	25.7 mg a.e./$L_{(nom)}$[7)]
Pimephales promelas	AMPA	Chronic (flow-through)	Hatching success, survival or growth NOEC	12 mg AMPA/$L_{(mm)}$
Danio rerio	AMPA	acute toxicity to zebrafish embryos (96h)	Mortality, LC_{50}	>100 mg AMPA/$L_{(mm)}$ #

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Aquatic invertebrates				
Daphnia magna	a.s. (Glyphosate K – salt)	48 h (static)	Mortality, EC_{50}	278 mg a.e./$L_{(mm)}$
Daphnia magna	a.s. (Glyphosate IPA-salt)	48 h (static)	Mortality, EC_{50}	>471 mg a.e./$L_{(im)}$
Daphnia magna	a.s. (Glyphosate technical)	48 h (static)	Mortality, EC_{50}	>334 mg a.e./$L_{(im)}$
Daphnia magna	a.s. (Glyphosate acid)	48 h (static)	Mortality, EC_{50}	>100 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate acid)	48 h (static)	Mortality, EC_{50}	40 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate)	48 h (static)	Mortality, EC_{50}	>100 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate IPA-salt)	48 h (static)	Mortality, EC_{50}	>45.64 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate technical)	48 h (static)	Mortality, EC_{50}	>62.5 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate IPA-salt)	48 h (static)	Mortality, EC_{50}	>581 mg a.e./$L_{(nom)}$ 8)
Daphnia magna	AMPA	48 h (static)	Mortality, EC_{50}	>100 mg AMPA/$L_{(nom)}$
Daphnia magna	AMPA	48 h (static)	Mortality, EC_{50}	>180 mg AMPA/$L_{(nom)}$
Daphnia magna	AMPA	48 h (static)	Mortality, EC_{50}	690 mg AMPA/$L_{(nom)}$ 9)
Daphnia magna	HMPA	48 h (static)	Mortality, EC_{50}	>100 mg HMPA/$L_{(nom)}$
Crassostrea gigas	a.s. (Glyphosate acid)	48 h (static)	Mortality, EC_{50}	40 mg a.e./$L_{(nom)}$
Hydra attenuate	a.s. (Glyphosate)	96 h (static, assumed 'no renewal indicated in	Mortality, LC_{50}	18.2 mg a.e./L #

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
		the paper)		
Crassostrea gigas	a.s. (Glyphosate)	48 h	Mortality, LC_{50} Abnormality rates in D-shaped larvae, EC_{50} Larvae abnormality, EC_{10}	>100 mg a.e./$L_{(mm)}$ # 27.1 mg a.e./$L_{(mm)}$ # 13.457 mg a.e./$L_{(mm)}$ #
Crassostrea gigas	AMPA	48 h	Mortality, LC_{50} Abnormality rates in D-shaped larvae, EC_{50} Larvae abnormality, EC_{10}	>100 mg AMPA/$L_{(mm)}$ # 46.1 mg AMPA/$L_{(mm)}$ # 10.299 mg AMPA/$L_{(mm)}$ #
Pomacea canaliculata	a.s. (Glyphosate)	96 h	Mortality, LC_{50}	174.7 mg a.e./L #
Daphnia magna	MON-52276	48 h (flow-through)	Mortality, EC_{50}	676 mg prep./L (209 mg a.e../$L_{(mm)}$)
Daphnia magna	a.s. (Glyphosate acid)	21 d (semi-static)	Reproduction, NOEC	12.5 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate)	21 d (semi-static)	Reproduction, NOEC	56 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate IPA-salt)	21 d (semi-static)	Reproduction, NOEC	42.90 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate)	21 d (semi-static)	Reproduction, EC_{10}	22.65 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate)	21 d (semi-static)	Reproduction, NOEC	100 mg a.e./$L_{(nom)}$
Daphnia magna	a.s. (Glyphosate)	21 d (flow-through)	Reproduction, NOEC	41 mg a.e./$L_{(mm)}$
Daphnia magna	AMPA	21 d (semi-static)	Reproduction, NOEC	15 mg AMPA/$L_{(nom)}$

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Cherax quadricarinatus (juveniles)	a.s. (Glyphosate)	Chronic, 60 d (semi-static)	Mortality Weight gain	33% mortality at 40 mg a.e./L # 35% decrease in weight gain at 40 mg a.e./L #
Neohelice granulate (adult females)	a.s. (Glyphosate)	Chronic, 3 months pre-reproductive period	Weight gain, NOEC	<0.02 mg a.e./L #
Neohelice granulate (adult males)	a.s. (Glyphosate)	Chronic, 30 d	Weight gain, NOEC	<1.27 mg a.e./L #
Sediment-dwelling organisms				
Chironomus riparius	a.s. (Glyphosate acid)	Water spiked (static)	NOEC	1000 mg a.e./L[10)]
Algae				
Pseudokirchneriella subcapitata *(Raphidocelis subcapitata)*	a.s. (Glyphosate IPA-salt)	96 h (static)	Growth rate: 72h ErC10 72h ErC20 72h NOErC 96h ErC10 96h ErC20 96h ErC50 96h NOErC Yield: 72h EyC10 72h EyC20 72h EyC50 72h NOEyC	 4.23 mg a.e./L (mm) 7.6 mg a.e./L (mm) 2.21 mg a.e./L (mm) 7.11 mg a.e./L (mm) 10.8 mg a.e./L (mm) 23.7 mg a.e./L (mm) 4.87 mg a.e./L (mm) 2.17 mg a.e./L (mm) 3.22 mg a.e./L (mm) 6.85 mg a.e./L (mm) 2.21 mg a.e./L

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
				(mm)
			96h EyC10	3.05 mg a.e./L (mm)
			96h EyC20	4.19 mg a.e./L (mm)
			96h EyC50	7.63 mg a.e./L (mm)
			96h NOEyC	2.21 mg a.e./L (mm)
Selenastrum caprocornutum *(Raphidocelis subcapitata)*	a.s. (Glyphosate technical)	96 h (static)	Growth rate:	
			72h ErC10	62.6 mg a.e./L[11)]
			72h ErC20	132 mg a.e./L[11)]
			72h ErC50	469 mg a.e./L[11)]
			72h NOErC	5.6 mg $a.e./L_{(nom)}$[11)]
			Yield:	
			72h EyC10	5.54 mg a.e./L[11)]
			72h EyC20	14.6 mg a.e./L[11)]
			72h EyC50	75.9 mg a.e./L[11)]
			72h NOEyC	5.6 mg $a.e./L_{(nom)}$[11)]
Selenastrum caprocornutum *(Raphidocelis subcapitata)*	a.s. (Glyphosate acid)	120h (static)	Growth rate:	
			72h ErC10	5.74 mg a.e./L (nom)
			72h ErC20	8.91 mg a.e./L (nom)
			72h ErC50	17.3 mg a.e./L (nom)
			72h NOErC	10 mg a.e./L (nom)
			Yield:	
			72h EyC10	4.84 mg a.e./L (nom)
			72h EyC20	7.59 mg a.e./L (nom)
			72h EyC50	16.4 mg a.e./L (nom)
			72h NOEyC	10 mg a.e./L (nom)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Pseudokirchneriella subcapitata *(Raphidocelis subcapitata)*	a.s. (Glyphosate)	72 h (static)	Growth rate: 72h ErC10 72h ErC50 72h NOErC Biomass: 72h EbC10 72h EbC50 72h NOEbC	 33 mg a.e./L (nom 54 mg a.e./L (nom) 32 mg a.e./L (nom) 18 mg a.e./L (nom) 48 mg a.e./L (nom) 10 mg a.e./L (nom)
Selenasstrum capricornutum *(Raphidocelis subcapitata)*	a.s. (Glyphosate technical)	168 h (static)	Growth rate: 72h ErC10 72h ErC20 72h ErC50 Yield: 72h EyC10 72h EyC20 72h EyC50	 < 10 mg a.e./L (nom) 10.8 mg a.e./L (nom) 20.1 mg a.e./L (nom) < 10 mg a.e./L (nom) 10.25 mg a.e./L (nom) 12.11 mg a.e./L (nom)
Anabaena flos-aquae	a.s. (Glyphosate technical)	168 h (static)	Growth rate: 72h ErC10 72h ErC20 72h ErC50 96h $ Yield: 72h EyC10 72h EyC20	 7.63 mg a.e./L (nom) 12.7 mg a.e./L (nom) 33.4 mg a.e./L (nom) 9.97 mg a.e./L (nom) 11.8 mg a.e./L (nom) 16.4 mg a.e./L

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			72h EyC50 96h $	(nom)
Navicula pelliculosa	a.s. (Glyphosate technical)	168 h (static)	Growth rate: 72h ErC10 $ 72h ErC20 $ 72h ErC50 $ Yield: 72h EyC10 $ 72h EyC20 $ 72h EyC50 $	-
Skeletonema costatum	a.s. (Glyphosate acid)	120 h (static)	Growth rate: 72h ErC10 72h ErC20 72h ErC50 72h NOErC Yield: 72h EyC10 72h EyC20 72h EyC50 72h NOEyC	 1.87 mg a.e./L (nom) 2.98 mg a.e./L (nom) 13.5 mg a.e./L (nom) 5.6 mg a.e./L (nom) 5.22 mg a.e./L (nom) 6.38 mg a.e./L (nom) 8.99 mg a.e./L (nom) 5.6 mg a.e./L (nom)
Pseudokirchneriella subcapitata *(Raphidocelis subcapitata)*	AMPA	72h (static)	Growth rate: 72h ErC10 72h ErC20 72h ErC50 72h NOErC Yield: 72h EyC10 72h EyC20	 92.8 mg AMPA/L (nom) 119 mg AMPA/L (nom) 191 mg AMPA/L (nom) 100 mg AMPA/L (nom) 58.2 mg AMPA/L (nom) 72.5 mg AMPA/L (nom)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			72h EyC50 72h NOEyC	110 mg AMPA/L (nom) 46 mg AMPA/L (nom)
Pseudokirchneriella subcapitata *(Raphidocelis subcapitata)*	HMPA	72h (static)	Growth rate: 72h ErC10 72h ErC20 72h ErC50 72h NOErC Yield: 72h EyC10 72h EyC20 72h EyC50 72h NOEyC	 >120 mg HMPA/L (nom) >120 mg HMPA/L (nom) >120 mg HMPA/L (nom) 60 mg HMPA/L (nom) 57.8 mg HMPA/L (nom) 80.4 mg HMPA/L (nom) > 120 mg HMPA/L (nom) 60 mg HMPA/L (nom)
Selenastrum capricornutum *(Raphidocelis subcapitata)*	MON-52276	72 h (static)	Data gap	
Higher plant				
Lemna minor	a.s. (Glyphosate IPA-salt)	7d (static)	<u>Fronds number</u> Growth rate: 7d ErC10 7d ErC20 7d ErC50 7d NOErC Yield: 7d EyC10 7d EyC20 7d EyC50	 8.16 mg a.e./L (nom) 12.8 mg a.e./L (nom) 30.3 mg a.e./L (nom) 8.65 mg a.e./L (nom) 7.8 mg a.e./L (nom) 10.3 mg a.e./L (nom) 16.5 mg a.e./L

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
				(nom)
			7d NOEyC	8.65 mg a.e./L (nom)
			<u>Dry weight</u>	
			Growth rate:	
			7d ErC10[$]	-
			7d ErC20[$]	-
			7d ErC50[$]	-
			7d NOErC[$]	-
			Yield:	
			7d EyC10	5.72 mg a.e./L (nom)
			7d EyC20	10.3 mg a.e./L (nom)
			7d EyC50	32.1 mg a.e./L (nom)
			7d NOEyC	8.65 mg a.e./L (nom)
			<u>Phytotoxicity</u>	
			NOEC	8.65 mg a.e./L (nom)
Lemna gibba	a.s. (Glyphosate acid)	14d (semi-static)	<u>Fronds number</u>	
			Growth rate:	
			7d ErC10	13.3 mg a.e./L (nom)
			7d ErC20	18.7 mg a.e./L (nom)
			7d ErC50	36.0 mg a.e./L (nom)
			7d NOErC	12 mg a.e./L (nom)
			Yield:	
			7d EyC10	10.5 mg a.e./L (nom)
			7d EyC20	14.2 mg a.e./L (nom)
			7d EyC50	24.0 mg a.e./L (nom)
			7d NOEyC	6 mg a.e./L (nom)
			<u>Phytotoxicity</u>	

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			NOEC	1.5 mg a.e./L (nom)
Lemna gibba	a.s. (Glyphosate technical)	14d (semi-static)	Fronds number Growth rate: 7d ErC10 7d ErC20 7d ErC50 7d NOErC Yield: 7d EyC10 7d EyC20 7d EyC50 7d NOEyC	 20.8 mg a.e./L (mm) 31.9 mg a.e./L (mm) >49.4 mg a.e./L (mm) 16.6 mg a.e./L (mm) 18.2 mg a.e./L (mm) 20.3 mg a.e./L (mm) 25.0 mg a.e./L (mm) 16.6 mg a.e./L (mm)
Spirodela polyrhiza	a.s. (Glyphosate)	7d (semi-static)	7d ErC50	Provisional endpoint: 12.817 mg a.e./L #
Myriophyllum aquaticum	AMPA	14 d (static)	Shoot length Growth rate 14d ErC10 14d ErC20 14d ErC50 14d NOErC Yield 14d EyC10 14d EyC20 14d EyC50 14d NOEyC	 6.1 mg AMPA/L (mm) 22.5 mg AMPA/L (mm) > 94.6 mg AMPA/L (mm) 14.3 mg AMPA/L (mm) 1.3 mg AMPA/L (mm) 5.8 mg AMPA/L (mm) > 94.6 mg AMPA/L (mm) 5.43 mg AMPA/L (mm)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			Shoot fresh weight Growth rate 14d ErC10 14d ErC20 14d ErC50 14d NOErC Yield 14d EyC10 14d EyC20 14d EyC50 14d NOEyC Shoot dry weight Growth rate 14d ErC10 14d ErC20 14d ErC50 14d NOErC Yield 14d EyC10 14d EyC20 14d EyC50 14d NOEyC Root length Growth rate 14d ErC10	24.2 mg AMPA/L (mm) 39 mg AMPA/L (mm) > 94.6 mg AMPA/L (mm) 14.3 mg AMPA/L (mm) 19.7 mg AMPA/L (mm) 30.6 mg AMPA/L (mm) 70.8 mg AMPA/L (mm) 14.3 mg AMPA/L (mm) 38.4 mg AMPA/L (mm) = 47.6 mg AMPA/L (mm) 72 mg AMPA/L (mm) 37.1 mg AMPA/L (mm) 33.9 mg AMPA/L (mm) 42 mg AMPA/L (mm) 63.2 mg AMPA/L (mm) 37.1 mg AMPA/L (mm) 17 mg AMPA/L (mm) 35.9 mg

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			14d ErC20 14d ErC50 14d NOErC Yield 14d EyC10 14d EyC20 14d EyC50 14d NOEyC	AMPA/L (mm) > 94.6 mg AMPA/L (mm) 14.3 mg AMPA/L (mm) 5.1 mg AMPA/L (mm) 9.5 mg AMPA/L (mm) 31.1 mg AMPA/L (mm) 2.23 mg AMPA/L (mm)
Lemna gibba	HMPA	7 d (semi-static)	Frond number/biomass/dry weight Growth rate 7d ErC10 7d ErC20 7d ErC50 7d NOErC Yield 7d EyC10 7d EyC20 7d EyC50 7d NOEyC	 > 123 mg HMPA/L (nom) > 123 mg HMPA/L (nom) > 123 mg HMPA/L (nom) 123 mg HMPA/L (nom) > 123 mg HMPA/L (nom) > 123 mg HMPA/L (nom) > 123 mg HMPA/L (nom) 123 mg HMPA/L (nom)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Lemna gibba	MON 52276	7 d (semi-static)	<u>Fronds number</u> Growth rate: 7d ErC50 7d NOErC Yield: 7d EyC50 7d NOEyC <u>Dry weight</u> Growth rate: 7d ErC10[$] 7d ErC20[$] 7d ErC50[$] 7d NOErC[$] Yield: 7d EyC50 7d NOEyC	 >150 mg prep./$L_{(nom)}$ (>46.35 mg a.e../L $_{(nom)}$ 19.1 mg prep./$L_{(nom)}$ (5.90 mg a.e../L $_{(nom)}$) 66.58 mg prep./$L_{(nom)}$ (20.57 mg a.e../L $_{(nom)}$) 19.1 mg prep./$L_{(nom)}$ (5.90 mg a.e../L $_{(nom)}$) - - - - 118.16 mg prep./$L_{(nom)}$ (36.51 mg a.e../L $_{(nom)}$) 19.1 mg prep./$L_{(nom)}$ (5.90 mg a.e../L $_{(nom)}$)
Myriophyllum aquaticum	MON 52276	14d (static)	Shoot length Growth rate	

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			14d ErC10	3.46 mg prep./L (1.07 mg a.e./L) (mm)
			14d ErC20	12.42 mg prep./L (3.81 mg a.e./L) (mm)
			14d ErC50	139.5 mg prep./L (42.79 mg a.e./L) (mm)
			14d NOErC	3.59 mg prep./L (1.1 mg a.e./L) (mm)
			Yield	
			14d EyC10	1.39 mg prep./L (0.43 mg a.e./L) (mm)
			14d EyC20	4.60 mg prep./L (1.41) mg a.e./L) (mm)
			14d EyC50	43.81 mg prep./L (13.44) mg a.e./L) (mm)
			14d NOEyC	3.59 mg prep./L (1.1 mg a.e./L) (mm
			Shoot fresh weight	
			Growth rate	
			14d ErC10	0.518 mg prep./L (0.16 mg a.e./L) (mm)
			14d ErC20	2.15 mg prep./L (0.66 mg a.e./L) (mm)
			14d ErC50	33.67 mg prep./L (10.33 mg a.e./L) (mm)
			14d NOErC	< 0.98 mg prep./L (< 0.3 mg a.e./L) (mm)
			Yield	
			14d EyC10	0.36 mg prep./L (0.11 mg a.e./L) (mm)
			14d EyC20	1.27 mg

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
				prep./L (0.39 mg a.e./L) (mm)
			14d EyC50	14.47 mg prep./L (4.44 mg a.e./L) (mm)
			14d NOEyC	< 0.98 mg prep./L (< 0.3 mg a.e./L) (mm)
			Shoot dry weight	
			Growth rate	
			14d ErC10	1.42 mg prep./L (0.44 mg a.e./L) (mm)
			14d ErC20	10.52 mg prep./L (3.23 mg a.e./L) (mm)
			14d ErC50	467.1 mg prep./L (143.3 mg a.e./L) (mm)
			Yield	
			14d EyC10	< 0.98 mg prep./L (< 0.3 mg a.e./L) (mm)
			14d EyC50	>473 mg prep./L (>145 mg a.e./L) (mm)
			Root length	
			Growth rate	
			14d ErC10	
			14d ErC20	7.22 mg prep./L (2.23 mg a.e./L) (mm)
			14d ErC50	20.63 mg prep./L (6.33 mg a.e./L) (mm)
			14d NOErC	151.6 mg prep./L (46.5 mg a.e./L) (mm)
			Yield	3.59 mg prep./L 1.1 mg a.e./L) (mm)
			14d EyC10	
			14d EyC20	3.40 mg

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
			14d EyC50 14d NOEyC	prep./L (1.05 mg a.e./L) (mm) 6.16 mg prep./L (1.89 mg a.e./L) (mm) 19.04 mg prep./L (5.84 mg a.e./L) (mm) 3.59 mg prep./L (1.1 mg a.e./L) (mm)
Further testing on aquatic organisms *[To report a short summary of mesocosms and SSD assessments and to include the associated AF for the representative use and explain the reason (briefly)]*				
Potential endocrine disrupting properties (Annex Part A, point 8.2.3) A Fish Short Term reproduction Assay is available. There is no indication of EAS-activity observed in the test.				

[1] ($_{nom}$) nominal concentration; ($_{mm}$) arithmetic mean measured concentration; (g_{mm}) geometric mean measured concentration; (im) initial measured concentration; prep.: preparation; a.e.: acid equivalent

Literature data considered as supplementary information for weight of evidence.

$ Data gap

Regarding supportive studies for which no analytical verification is indicated, they have been considered as supportive given either that analytical verifications is not a validity criteria in guidelines (only recommandations) or that there is evidence from other related studies that the exposure can be considered satisfactory.

1) Supportive data: No analytical test verifications, exposure cannot be confirmed. Other small deviations (pH, fish lengths)

2) Supportive data: no analytics, pH issue

3) Supportive data: Results can not be considered for acute risk assessment as fish are bigger than recommended.
pH issue (endpoint set at highest concentration without effects)

4) Supportive data: No analytical test verifications, exposure cannot be confirmed

5) Supportive data: Insufficient analytical test verifications, exposure cannot be confirmed

6) Supportive data: test species not listed in the recommended species of OECD 203. Sensitivity of individuals of that size size (5.90 cm) is not known

7) Supportive data: Analytical method validation not available. Indirect quantification of glyphosate. Some parameters show high variability. Statistics not reliable.

8) Supportive data: No analytical verification of test concentrations

9) Supportive data: Analytical separate report (ML-90-403/EHL-90187-Daphnia) with no results reported on analytics. No validation data for analytical method was available.

10) Supportive data: No analytical verification in sediment. No report for analytical method was available.

11) Supportive data: No analytical verification of test concentrations throughout the test.

Bioconcentration in fish (Annex Part A, point 8.2.2.3)

	Active substance	Metabolite 1	Metabolite 2	Metabolite 3
$logP_{O/W}$				
Steady-state bioconcentration factor (BCF) (total wet weight/normalised to 5% lipid content)	No BCF validated*, **			
Uptake/depuration kinetics BCF (total wet weight/normalised to 5% lipid content)				
Annex VI Trigger for the bioconcentration factor				
Clearance time (days) (CT_{50})				
(CT_{90})				
Level and nature of residues (%) in organisms after the 14 day depuration phase				
Higher tier study				

* based on total ^{14}C or on specific compounds

** study provide however evidence that the potential for bioaccumulation of glyphosate is low.

Toxicity/exposure ratios for the most sensitive aquatic organisms (Regulation (EU) N° 284/2013, Annex Part A, point 10.2)

Provisional PEC/RAC: data gap on PECsw/sed.

FOCUSsw step 1-2 – PEC/RACs for glyphosate – field uses at 2 x 1440 g a.s./ha

		fish acute	**fish chronic**	**Aquatic invertebrates**	**Aquatic invertebrates prolonged**	**Algae**	**Higher plant**
		Lepomis macrochirus	*Brachydanio rerio*	*Crassostrea gigas*	*Daphnia magna*	*Skeletonema costatum*	*Myriophyllum aquaticum*
		LC_{50}	NOEC	EC_{50}	NOEC	ErC_{50}	ErC_{50}
		32000 µg/L	1000 µg/L	40000 µg/L	12500 µg/L	13500 µg/L	10330 µg/L
AF		100	10	100	10	10	10
RAC (µg/L)		320	100	400	1250	1350	1033
Scenario	**PEC global max (µg L)**						
FOCUS Step 1							
	167.72	0.52	**1.68**	0.42	0.13	0.12	0.16
FOCUS Step 2							
North Europe	69.95	0.22	0.70	0.17	0.06	0.05	0.07
South Europe	56.86	0.18	0.57	0.14	0.05	0.04	0.06

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

FOCUSsw step 1-2 - TERs for AMPA – field uses at 2 x 1440 g a.s./ha

		fish acute	fish chronic	Aquatic invertebrates	Aquatic invertebrates prolonged	Algae	Higher plant
		Oncorhynchus mykiss	*Pimephales promelas*	*Daphnia magna*	*Daphnia magna*	*Pseudokirchneriella subcapitata*	*Myriophyllum aquaticum*
		LC_{50}	NOEC	EC_{50}	NOEC	ErC_{50}	ErC_{50}
		100000 µg/L	12000 µg/L	100000 µg/L	15000 µg/L	191000 µg/L	72000 µg/L
AF		100	10	100	10	10	10
RAC (µg/L)		1000	1200	1000	1500	19100	7200
Scenario	**PEC global max (µg L)**						
FOCUS Step 1							
	111.02	0.11	0.09	0.11	0.07	0.01	0.02
FOCUS Step 2							
North Europe	52.47	0.05	0.04	0.05	0.03	0.003	0.01

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

FOCUSsw step 1-2 – PEC/RACs for HMPA – field uses at 2 x 1440 g a.s./ha

		Aquatic invertebrates	Algae	Higher plant
		Daphnia magna	*Pseudokirchneriella subcapitata*	*Lemna gibba*
		EC_{50}	ErC_{50}	EC_{50}
		> 100000 µg/L	> 120000 µg/L	> 123000 µg/L
		100	10	10
		> 1000	> 12000	> 12300
Scenario	**PEC global max (µg L)**			
FOCUS Step 1				
	58.06	0.06	0.005	0.005
FOCUS Step 2				
North Europe	52.47	0.05	0.004	0.004

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

PEC/RACs for glyphosate – railways at 1 x 3600 g a.s./ha

		fish acute	**fish chronic**	**Aquatic invertebrates**	**Aquatic invertebrates prolonged**	**Algae**	**Higher plant**
		Lepomis macrochirus	*Brachydanio rerio*	*Crassostrea gigas*	*Daphnia magna*	*Skeletonema costatum*	*Myriophyllum aquaticum*
		LC_{50}	NOEC	EC_{50}	NOEC	ErC_{50}	ErC_{50}
		32000 µg/L	1000 µg/L	40000 µg/L	12500 µg/L	13500 µg/L	10330 µg/L
AF		100	10	100	10	10	10
RAC (µg/L)		320	100	400	1250	1350	1033
Scenario	**PEC global max (µg L)**						
Railway ditch	9.458	0.03	0.09	0.02	0.01	0.01	0.01

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

PEC/RACs for AMPA – railways at 1 x 3600 g a.s./ha

		fish acute	**fish chronic**	**Aquatic invertebrates**	**Aquatic invertebrates prolonged**	**Algae**	**Higher plant**
		Oncorhynchus mykiss	*Pimephales promelas*	*Daphnia magna*	*Daphnia magna*	*Pseudokirchneriella subcapitata*	*Myriophyllum aquaticum*
		LC_{50}	NOEC	EC_{50}	NOEC	ErC_{50}	ErC_{50}
		100000 µg/L	12000 µg/L	100000 µg/L	15000 µg/L	191000 µg/L	72000 µg/L
AF		100	10	100	10	10	10
RAC (µg/L)		1000	1200	1000	1500	19100	7200
Scenario	**PEC global max (µg L)**						
Railway ditch	6.210	0.01	0.01	0.006	0.004	0.0003	0.001

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

PEC/RACs for HMPA – railways at 1 x 3600 g a.s./ha

		Aquatic invertebrates	**Algae**	**Higher plant**
		Daphnia magna	*Pseudokirchneriella subcapitata*	*Lemna gibba*
		EC_{50}	ErC_{50}	EC_{50}
		> 100000 µg/L	> 120000 µg/L	> 123000 µg/L
AF		100	10	10
RAC (µg/L)		> 1000	> 12000	> 12300
Scenario	**PEC global max (µg L)**			
Railway ditch	0.627	> 0.001	> 0.0001	> 0.0001

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in **bold**

Effects on bees (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.1 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.1)*

* This section does reflect the new EFSA Guidance Document on bees which has not yet been noted by the Standing Committee on Plants, Animals, Food and Feed.

Species	Test substance	Time scale/type of endpoint	End point	toxicity
Apis mellifera L.	a.s.,	Acute	Oral toxicity (LD_{50})	>104 µg/bee
Apis mellifera L.	a.s.,	Acute	Oral toxicity (LD_{50})	>182 µg/bee
Apis mellifera L.	a.s.,	Acute	Oral toxicity (LD_{50})	>40 µg/bee
Apis mellifera L.	a.s.,	Acute	Oral toxicity (LD_{50})	>200 µg/bee
Apis mellifera L.	a.s.,	Acute	Oral toxicity (LD_{50})	116.67 µg/bee
Apis mellifera L.	MON 52276	Acute	Oral toxicity (LD_{50})	>77 µg a.s./bee
Bombus terrestris	a.s.,	Acute	Oral toxicity (LD_{50})	>412 µg/bee
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>100 µg/bee
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>61.3 µg/bee (IPA salt equivalent)*
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>103 µg/bee
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>20 µg/bee
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>200 µg/bee
Apis mellifera L.	a.s.,	Acute	Contact toxicity (LD_{50})	>100 µg/bee
Bombus terrestris	a.s.,	Acute	Contact toxicity (LD_{50})	>461 µg/bee
Osmia bicornis	a.s.,	Acute	Contact toxicity (LD_{50})	>461 µg/bee
Apis mellifera L.	MON 52276	Acute	Contact toxicity (LD_{50})	>100 µg a.s./bee
Apis mellifera L.	a.s.,	Adult Chronic	10 d-LDD50 10 d-NOEDD	>179 µg/bee/day 179 µg/bee/day
Apis mellifera L.	a.s.,	Bee brood development	22 d-ED10	75.6 µg/larva/developmental

			22 d-NOED	period 80 µg/larva/ developmental period
Apis mellifera	a.s.,	Bee brood feeding test. Field study	NOAEL	301 mg/L (nominal), 266 mg/kg, (measured).

* acid equivalent purity not provided

Potential for accumulative toxicity: *yes/no*
Semi-field test (Cage and tunnel test) [redacted] **2011** : Residues in honeybee colony -Phacelia semi-field application at 8 L product/ha (2.88 g a.e./ha) during flowering and in the presence of foraging bees. Total daily intake of glyphosate residues (via nectar + pollen) of: - 269.3 mg a.e. (based on day 1 maximum mean residues), - 141.8 mg a.e. (based on mean residues over days 1-3).
Field tests -

Risk assessment for – All representative uses at 1800 g a.s./ha x 1

Species	Test substance	Risk quotient	HQ/ETR	Trigger
Apis mellifera L.	a.s.	HQcontact	< 18	50
Apis mellifera L.	a.s.	HQoral	< 23.4	50
Apis mellifera L.	a.s.	ETRacute adult oral	< 18	42
Apis mellifera L.	a.s.	ETRacute adult contact	0.18	< 0.2
Apis mellifera L.	a.s.	ETRchronic adult oral	**<0.076**	< 0.03
Apis mellifera L.	a.s.	ETRlarvae*	0.1	< 0.2
Bombus terrestris	a.s.	HQcontact	<3.9	7
Bombus terrestris	a.s.	ETRoral	**<0.05**	0.036
Osmia bicornis	a.s.	HQcontact	<3.9	8

*considering ED_{10} of 75.6 µg/larva/developmental period

First Tier risk assessment for adult chronic oral exposure

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 in orchard crops and vines at 1440 g a.e./ha

Intended use	Orchard crops, vines (Uses: 4a, 5a)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	Weeds	weed <10	1	0.27	<0.01	0.03
			weed ≥10	1	2.9	<0.02	
		field margin	weed <10	0.0092	2.9	<0.01	
			weed ≥10	0.0092	2.9	<0.01	
		adjacent crop	weed <10	0.0033	5.8	<0.01	
			weed ≥10	0.0033	5.8	<0.01	
		next crop	weed <10	1	0.54	<0.01	
			weed ≥10	1	0.54	<0.01	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 in orchard crops and vines at 1080 g a.e./ha

Intended use	Orchard crops, vines (Uses: 4a, 4b, 5a, 5b)
Application method	downward spraying
Crop category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-3 x 1080 g a.e./ha

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	Weeds	weed <10	1	0.27	<0.001	0.03
			weed ≥10	1	2.9	<0.013	
		field margin	weed <10	0.0092	2.9	<0.001	
			weed ≥10	0.0092	2.9	<0.001	
		adjacent crop	weed <10	0.0033	5.8	<0.001	
			weed ≥10	0.0033	5.8	<0.001	
		next crop	weed <10	1	0.54	<0.002	
			weed ≥10	1	0.54	<0.002	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1080 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 in orchard crops and vines at 720 g a.e./ha

Intended use	Orchard crops, vines (Uses: 4b, 4c, 5b, 5c)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-3 x 720 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	Weeds	weed <10	1	0.27	<0.001	0.03
			weed ≥10	1	2.9	<0.008	
		field margin	weed <10	0.0092	2.9	<0.001	
			weed ≥10	0.0092	2.9	<0.001	
		adjacent crop	weed <10	0.0033	5.8	<0.001	
			weed ≥10	0.0033	5.8	<0.001	
		next crop	weed <10	1	0.54	<0.002	
			weed ≥10	1	0.54	<0.002	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 720 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 – railroad tracks at 1800 g a.e./ha

Intended use	Railroad tracks (Uses: 7a, 7b)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-2 x 1800 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	Weeds	weed <10	1	0.27	<0.002	0.03
			weed ≥10	1	2.9	<0.021	
		field margin	weed <10	0.0092	2.9	<0.001	
			weed ≥10	0.0092	2.9	<0.001	
		adjacent crop	weed <10	0.0033	5.8	<0.001	
			weed ≥10	0.0033	5.8	<0.001	
		next crop	weed <10	1	0.54	<0.004	
			weed ≥10	1	0.54	<0.004	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] As no definite scenario for railroad tracks is provided by the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, the under crop application scenario was considered to address uses on railroad tracks
[2] Max. single application rate of 1800 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 – invasive plant species in agricultural and non-agricultural areas at 1800 g a.e./ha

Intended use	invasive plant species in agricultural and non-agricultural areas (Uses: 8, 9)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1 x 1800 g a.e./ha

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	Weeds	weed <10	1	0.27	<0.002	0.03
			weed >10	1	2.9	<0.021	
		field margin	weed <10	0.0092	2.9	<0.001	
			weed >10	0.0092	2.9	<0.001	
		adjacent crop	weed <10	0.0033	5.8	<0.001	
			weed >10	0.0033	5.8	<0.001	
		next crop	weed <10	1	0.54	<0.004	
			weed >10	1	0.54	<0.004	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] As no definite scenario for invasive weeds is provided by the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, under crop application: giant hogweed (*Heracleum* spp.) and Japanese knotweed (*Reynoutria japonica*)

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 – pre-sowing, pre-planting and post-harvest uses at 1440 g a.e./ha

Intended use	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet (Uses: 1a, 2a)
Application method	downward spraying
Crop category	bare soil application – crop attractive for pollen and nectar[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	<10	1	0.54	<0.003	0.03
		Weeds	<10	1	0.27	<0.002	
		field margin	<10	0.0092	2.9	<0.001	
		adjacent crop	<10	0.0033	5.8	<0.001	
		next crop	<10	1	0.54	<0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - pre-sowing, pre-planting and post-harvest uses at 1080 g a.e./ha

Intended use	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet, Legume vegetables (Uses: 1b, 2a, 2b, 2c, 6a, 10a)
Application method	downward spraying
Crop category	bare soil application – crop attractive for pollen and nectar[1]
Active substance	Glyphosate
Use pattern	1-3 x 1080 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	<10	1	0.54	<0.002	0.03
		Weeds	<10	1	0.27	<0.001	
		field margin	<10	0.0092	2.9	<0.001	
		adjacent crop	<10	0.0033	5.8	<0.001	
		next crop	<10	1	0.54	<0.002	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1080 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - pre-sowing, pre-planting and post-harvest uses at 720 g a.e./ha

Intended use	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet, Legume vegetables (Uses: 1c, 2b, 6b, 10b, 10c)
Application method	downward spraying
Crop category	bare soil application – crop attractive for pollen and nectar[1]
Active substance	Glyphosate
Use pattern	1-3 x 720 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	<10	1	0.54	<0.002	0.03
		Weeds	<10	1	0.27	<0.001	
		field margin	<10	0.0092	2.9	<0.001	
		adjacent crop	<10	0.0033	5.8	<0.001	
		next crop	<10	1	0.54	<0.002	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category in the first tier oral assessment according to the EFSA GD on the Risk Assessment on Bees (2013)
[2] Max. single application rate of 720 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 – fruiting vegetables

Intended use	Fruiting vegetables, (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	fruiting vegetables 1, fruiting vegetables 2[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Fruiting vegetables 1							
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			10 - 49[3]	1	5.8	**0.033**	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 49[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 49[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 49[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	

Intended use		Fruiting vegetables, (Uses: 1, 2, 3, 6, 10)					
Application method		downward spraying					
Crop category		fruiting vegetables 1, fruiting vegetables 2[1]					
Active substance		Glyphosate					
Use pattern		1-2 x 1440 g a.e./ha[2]					
Test design	**Endpoint (lab.)**	**Scenario**	**BBCH**	**E_f**	**SV**	**ETR**	**Trigger**
			10 - 49[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	
Fruiting vegetables 2							
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.012	0.000	0.03
			10 - 49[3]	1	0.92	0.005	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 49[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 49[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 49[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 49[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - root vegetables

Intended use	Root vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	Root vegetables[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			10 - 39[3]	1	5.8	**0.033**	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 39[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 39[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 39[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 39[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, e.g. fruiting vegetables 2 = tomatoes, eggplants

[2] Max. single application rate of 1080 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 –tuber vegetables

Intended use	Tuber vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	potatoes[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.012	0.000	0.03
			10 - 39[3]	1	0.92	0.005	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 39[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 39[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 39[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 39[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, e.g. fruiting vegetables 2 = tomatoes, eggplants

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 – Bulb vegetables

Intended use	Bulb vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	bulb vegetables[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			10 - 39[3]	1	5.8	**0.033**	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 39[3]	1	2.9	0.017	
			≥ 70	0.6	2.9	0.010	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 39[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 39[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 39[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.
[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - Brassica, leafy and stem vegetables

Intended use	Brassica, leafy vegetables, stem vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	leafy vegetables, lettuce[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Leafy vegetables							
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			10 - 49[3]	1	5.8	**0.033**	

Intended use	Brassica, leafy vegetables, stem vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	leafy vegetables, lettuce[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 49[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 49[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 49[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 49[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	
Lettuce							
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.012	0.000	0.03
			10 - 49[3]	1	0.92	0.005	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 49[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 49[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 49[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 – 49[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - Sugar beet

Intended use	Sugar beet (Uses: 1, 2, 3, 10)
Application method	downward spraying
Crop category	sugar beet[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			≥ 70	0.25	2.9	0.004	
		field margin	< 10	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 - legume vegetables

Intended use	Legume vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	pulses[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Adult chronic oral toxicity	LDD_{50} > 179.9 µg a.e./bee/day	treated crop	< 10	1	0.54	0.003	0.03
			10 49[3]	1	5.8	**0.033**	
			≥ 70	1	0	0.000	
		Weeds	< 10	1	2.9	0.017	
			10 - 49[3]	1	2.9	0.017	
			≥ 70	0.3	2.9	0.005	
		field margin	< 10	0.0092	2.9	0.000	
			10 - 49[3]	0.0092	2.9	0.000	
			≥ 70	0.0092	2.9	0.000	
		adjacent crop	< 10	0.0033	5.8	0.000	
			10 - 49[3]	0.0033	5.8	0.000	
			≥ 70	0.0033	5.8	0.000	
		next crop	< 10	1	0.54	0.003	
			10 - 49[3]	1	0.54	0.003	
			≥ 70	1	0.54	0.003	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.
[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for honey bees due to the use of MON 52276 on fruiting, root, bulb and leafy vegetables and pulses for "treated crop" scenario at all application rates for uses 6a and 6b

Crop	Fruiting vegetables 1, Root vegetables, Bulb vegetables, Leafy vegetables, Pulses (uses 6a and 6b)
Application method	downward spraying
Active substance	Glyphosate
Toxicity value	LDD_{50} > 179.9 µg a.e./bee/day

Scenario	BBCH stage	Max. single application rate (kg a.e./ha)	E_f	SV	ETR	Trigger
Treated crop	BBCH 10-39 or BBCH 10-49	1.08	1	5.8	0.025	0.03
		0.72	1	5.8	0.017	

Assessment of the risk for bees due to the use of MON 52276 considering exposure to contaminated water

Intended use	All uses (Uses: 1a-10c)
Application method	downward spraying
Active substance	Glyphosate
Use pattern	2 x 1440 g a.e./ha (worst-case identified for PECsw see B.9.4)
Water solubility	100000 mg/L (see Volume 1, [redacted] (2020a), KCA 2.5/001)
PEC_{sw}	worst case Step 2 of 69.95 µg/L
PEC_{puddle}	worst case Step 2 of 65.47 µg/L

Surface water[1] (provisional)				
Test design	**Endpoint (lab.)**	**water consumption (µl)**	**ETR[1]**	**Trigger**
Acute	77 µg a.e./bee	11.4	0.00	0.2
Chronic	>179.9 µg a.e./bee/day	11.4	0.000	0.03
Larvae	75.6 µg a.e./larva	111	0.00	0.2
Puddle water[1,2] (provisional)				
Test design	**Endpoint (lab.)**	**water consumption (µl)**	**ETR[2]**	**Trigger**
Acute	77 µg a.e./bee	11.4	0.00	0.2
Chronic	>179.9 µg a.e./bee/day	11.4	0.000	0.03
Larvae	75.6 µg a.e./larva	111	0.00	0.2
Guttation water				
Test design	**Endpoint (lab.)**	**water consumption (µl)**	**ETR**	**Trigger**
Acute	77 µg a.e./bee	11.4	**14.8**	0.2
Chronic	>179.9 µg a.e./bee/day	11.4	**<3.3**	0.03
Larvae	75.6 µg a.e./larva	111	**105.7**	0.2

First Tier risk assessment for acute oral exposure of bumble bees

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 in orchard crops and vines at 1440 g a.e./ha

Intended use	Orchard crops, vines (Uses: 4a, 5a)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	weeds	weed <10	1	0.46	<0.01	0.036
			weed ≥10	1	6.5	<0.023	
		field margin	weed <10	0.0092	6.5	<0.01	
			weed ≥10	0.0092	6.5	<0.01	
		adjacent crop	weed <10	0.0033	11.2	<0.01	
			weed ≥10	0.0033	11.2	<0.01	
		next crop	weed <10	1	0.9	<0.01	
			weed ≥10	1	0.9	<0.01	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 – railroad tracks at 1800 g a.e./ha

Intended use	Railroad tracks (Uses: 7a, 7b)
Application method	downward spraying
Crop Category	under crop application[1]
Active substance	Glyphosate
Use pattern	1-2 x 1800 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	weeds	weed <10	1	0.46	<0.002	0.036
			weed ≥10	1	6.5	<0.028	
		field margin	weed <10	0.0092	6.5	<0.001	
			weed ≥10	0.0092	6.5	<0.001	
		adjacent crop	weed <10	0.0033	11.2	<0.001	
			weed ≥10	0.0033	11.2	<0.001	
		next crop	weed <10	1	0.9	<0.004	
			weed ≥10	1	0.9	<0.004	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] As no definite scenario for railroad tracks is provided by the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, the under crop application was considered to address uses on railroad tracks
[2] Max. single application rate of 1800 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 – invasive plant species in agricultural and non-agricultural areas at 1800 g a.e./ha

Intended use	invasive plant species in agricultural and non-agricultural areas (Uses: 8, 9)
Application method	downward spraying
Crop Category	under crop application [1]
Active substance	Glyphosate
Use pattern	1 x 1800 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	weeds	weed <10	1	0.46	<0.002	0.036
			weed >10	1	6.5	<0.028	
		field margin	weed <10	0.0092	6.5	<0.001	
			weed >10	0.0092	6.5	<0.001	
		adjacent crop	weed <10	0.0033	11.2	<0.001	
			weed >10	0.0033	11.2	<0.001	
		next crop	weed <10	1	0.9	<0.004	
			weed >10	1	0.9	<0.004	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] As no definite scenario for invasive weeds is provided by the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator, under crop application: giant hogweed (*Heracleum* spp.), Japanese knotweed (*Reynoutria japonica*)
[2] Max. single application rate of 1800 g a.e./ha considered for risk calculation

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 –pre-sowing, pre-planting and post-harvest uses at 1440 g a.e./ha

Intended use	Root & tuber vegetables, Bulb vegetables, Fruiting vegetables, Brassica, Leafy vegetables, Stem vegetables, Sugar beet (Uses: 1a, 2a)
Application method	downward spraying
Crop category	bare soil application – crop attractive for pollen and nectar[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	<10	1	0.9	<0.004	0.036
		weeds	<10	1	0.46	<0.002	
		field margin	<10	0.0092	6.5	<0.001	
		adjacent crop	<10	0.0033	11.2	<0.001	
		next crop	<10	1	0.9	<0.004	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower application rates.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 – fruiting vegetables

Intended use	Fruiting vegetables, (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	fruiting vegetables 1, fruiting vegetables 2[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	E_f	SV	ETR	Trigger
Fruiting vegetables 1							
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.036
			10 - 49[3]	1	11.2	**0.0391**	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 49[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 49[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 49[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	

Intended use		Fruiting vegetables, (Uses: 1, 2, 3, 6, 10)					
Application method		downward spraying					
Crop category		fruiting vegetables 1, fruiting vegetables 2[1]					
Active substance		Glyphosate					
Use pattern		1-2 x 1440 g a.e./ha[2]					
Test design	**Endpoint (lab.)**	**Scenario**	**BBCH**	**E_f**	**SV**	**ETR**	**Trigger**
			10 - 49[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	
Fruiting vegetables 2							
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.03	0.0001	0.036
			10 - 49[3]	1	2.3	0.0080	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 49[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 49[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 49[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 49[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 – rootvegetables

Intended use	Root vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	Root vegetables[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.036
			10 - 39[3]	1	11.2	**0.0391**	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 39[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 39[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 39[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 39[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.
[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 - tuber vegetables

Intended use	Tuber vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	potatoes[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.03	0.0001	0.036
			10 - 39[3]	1	2.3	0.0080	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	

Intended use	Tuber vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	potatoes[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
			10 - 39[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 39[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 39[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 39[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 - Bulb vegetables

Intended use	Bulb vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	bulb vegetables[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.036
			10 - 39[3]	1	11.2	0.0391	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 39[3]	1	6.5	0.0227	
			≥ 70	0.6	6.5	0.0136	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 39[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 39[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 39[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.
[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 - Brassica, leafy and stem vegetables

Intended use	Brassica, leafy vegetables, stem vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	leafy vegetables, lettuce[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Leafy vegetables							
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.036
			10 - 49[3]	1	11.2	**0.0391**	

Intended use	Brassica, leafy vegetables, stem vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	leafy vegetables, lettuce[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 49[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 49	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 49[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 49[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	
Lettuce							
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.03	0.0001	0.036
			10 - 49[3]	1	2.3	0.0080	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 49[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 49[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			10 - 49[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 – 49[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.

[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,

[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 - Sugar beet

Intended use	Sugar beet (Uses: 1, 2, 3, 10)
Application method	downward spraying
Crop category	sugar beet[1]
Active substance	Glyphosate
Use pattern	1-3 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.036
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			≥ 70	0.25	6.5	0.0057	
		field margin	< 10	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.

First-tier assessment (oral exposure) of the risk for bumble bees due to the use of MON 52276 - legume vegetables

Intended use	Legume vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	pulses[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
Acute oral toxicity	LD_{50} > 412 µg a.e./bee	treated crop	< 10	1	0.9	0.0031	0.03
			10 49[3]	1	11.2	**0.0391**	
			≥ 70	1	0	0.0000	
		Weeds	< 10	1	6.5	0.0227	
			10 - 49[3]	1	6.5	0.0227	
			≥ 70	0.3	6.5	0.0068	
		field margin	< 10	0.0092	6.5	0.0002	
			10 - 49[3]	0.0092	6.5	0.0002	
			≥ 70	0.0092	6.5	0.0002	
		adjacent crop	< 10	0.0033	11.2	0.0001	

Intended use	Legume vegetables (Uses: 1, 2, 3, 6, 10)
Application method	downward spraying
Crop category	pulses[1]
Active substance	Glyphosate
Use pattern	1-2 x 1440 g a.e./ha[2]

Test design	Endpoint (lab.)	Scenario	BBCH	Ef	SV	ETR	Trigger
			10 - 49[3]	0.0033	11.2	0.0001	
			≥ 70	0.0033	11.2	0.0001	
		next crop	< 10	1	0.9	0.0031	
			10 - 49[3]	1	0.9	0.0031	
			≥ 70	1	0.9	0.0031	

Ef: exposure factor; SV: shortcut value; ETR: exposure toxicity ratio.
[1] Crop category chosen according to the recommendations of the EFSA GD on the Risk Assessment on Bees (2013) and the EFSA Screening Step and 1st Tier Calculator,
[2] Max. single application rate of 1440 g a.e./ha considered for risk calculation as it covers lower rates.
[3] Scenario only relevant for uses 6a and b for which the highest intended application rate is 1.08 kg a.s./ka.

Effects on other arthropod species (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.2)

Laboratory tests with standard sensitive species

Species	Test Substance	End point	Toxicity
Typhlodromus pyri	MON 52276	Mortality, LR_{50} Reproduction, ER_{50}	100% mortality at10 L MON 52276/ha (3.6 kg a.e/ha) on day 4 No reproduction endpoint (supportive)*
Aphidius rhopalosiphi	MON 52276	Mortality, LR_{50} Reproduction, ER_{50}	100% mortality at10 L MON 52276/ha (3.6 kg a.e/ha) on day 4 No reproduction endpoint (supportive)**
Additional species			
Poecilus cupreus	MON 52276	Mortality, LR_{50}	> 10 L/ha (3600 g a.e./ha)
Pardosa sp.	MON 52276	Mortality, LR_{50}	> 10 L/ha (3600 g a.e./ha)***

a.e.: glyphosate acid equivalent
* guideline used does not meet current standards. Alteration of moving behaviour due to wet sticky layer on the treated glass plates.
**guideline used does not meet current standards. Control with 60 instead of 100 mites.
***reliable for application from the beginning of August onwards. Supportive for application from the beginning of August onwards (sensitivity of the collected spiders may be lesser than for over-wintered individuals)

First tier risk assessment covering all representative uses at 1800 g a.s./ha x 2
(worst case assumption made : maximum dose rate, maximum number of application, default MAF set at 2)

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	HQ off-field	Trigger

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	HQ off-field	Trigger
MON 52276	*Typhlodromus pyri*	No reliable endpoint			2
MON 52276	*Aphidius rhopalosiphi*	No reliable endpoint			2
MON 52276	*Poecilus cupreus*	>3600	<1	<0.024 (1m)	
MON 52276	*Pardosa sp.*	>3600	<1	<0.024 (1m)	

Extended laboratory tests, aged residue tests

Species	Life stage	Test substance, substrate	Time scale	Dose (g/ha)[1,2]	End point	% effect[3]	ER_{50}
Typhlodromus pyri	proto-nymph	MON 52276 Leaves of potted vine plants Extended lab	18d	3, 6 and 12 L prod /ha	Mortality	84% at 6 L prod./ha 89% at 12 L prod./ha (supportive)*	-
Typhlodromus pyri	proto-nymph	MON 52276 Leaf discs of French beans Extended lab / 2D	14d	3 to 16 L prod /ha	Mortality (at 7d)	40% at 16.0 L/ha (5760 g a.e./ha)	ER50 (repro) ≥ 12 L/ha (4320 g a.e./ha)
					Reproduction (at 14d)	Reduction in no. of egg/female of 44.9 % at 12 L/ha and 56.5% at 16 L/ha NOER = 8 L/ha (2880 g a.e./ha)	
Aphidius rhopalosiphi	adult	MON 52276 Extended lab	2d+10d	3, 6 and 12 L prod./ha	Mortality	Effects on mortality less than 50% up to 12 L/ha	Supportive**
					reproduction	No adverse effects on reproduction up to 12L/ha	
Aphidius rhopalosiphi	adult	MON 52276 seedling barley Extended lab / 3D	2d+10d	4, 6, 8, 12 and 16 L prod./ha	Mortality	LR50> 16.0 L/ha (5760 g a.e./ha)	ER50 > 16 L/ha (5760 g a.e./ha)
					reproduction	NOER ≥ 16 L/ha (5760 g a.e./ha)	

Species	Life stage	Test substance, substrate	Time scale	Dose (g/ha)[1,2]	End point	% effect[3]	ER_{50}
Aleochara bilineata	3-4d old	MON 52276 Extended lab	28d	6, 8 and 12 L prod./ha	Mortality	> 12.0 L/ha (4320 g a.e./ha)	ER50 > 12 L/ha (4320 g a.e./ha)
					reproduction	ER50 > 12 L/ha (4320 g a.e./ha) NOER ≥ 12 L/ha (4320 g a.e./ha)	
Chrysoperla carnea	larvae	MON 52276 Extended lab	21d	0.6, 6 and 12 L prod./ha	Mortality	LR50 = 10.34 L MON 52276/ha Supportive ***	No reliable endpoint could be set for reproduction ***

[1] indicate whether initial or aged residues
[2] for preparations indicate whether dose is expressed in units of a.s. or preparation
[3] indicate if positive percentages relate to adverse effects or not
a.e.: glyphosate acid equivalent
*guideline used does not meet current standards. sensitivity of species questionable.
**sensitivity of species questionable and low robustness
*** Sensitivity of species questionable. Control eggs < 15 (actual 7.9).

Risk assessment covering all representative uses at 1800 g a.s./ha x 2 based on extended lab test or aged residue tests
(worst case assumption made : maximum dose rate, maximum number of application, default MAF set at 2)

Species	ER_{50} (g/ha)	In-field rate	Off-field rate
T. pyri	>4320	3600	42.84 (1m / 2D)
A. rhopalosiphi	>5760		428.4 (1m / 3D)
Aleochara bilineata	>4320		42.84 (1m / 2D)

Semi-field tests
None
Field studies
None
Additional specific test
None

Effects on non-target soil meso- and macro fauna; effects on soil nitrogen transformation (Regulation (EU) N° 283/2013, Annex Part A, points 8.4, 8.5, and Regulation (EU) N° 284/2013 Annex Part A, points 10.4, 10.5)

Test organism	Test substance	Application method of test a.s./ OM[1]	Time scale	End point	Toxicity
Earthworms					
Eisenia fetida	a.s.	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 473 mg a.s./kg d.w.soil
Eisenia fetida	a.s.	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 21.31 mg a.s./kg d.w.soil*
Eisenia fetida	MON 52276	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 123 mg PP/kg d.w. soil (38 mg a.s./kg d.w.soil)
Eisenia fetida	AMPA	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 131 mg AMPA/kg d.w.soil
Eisenia fetida	AMPA	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 28.12 mg AMPA/kg d.w.soil*
Eisenia fetida	AMPA	Mixed into substrate/ 10% peat content	Chronic 56 d	Mortality, growth and reproduction	NOEC = 19.7 mg AMPA/kg d.w.soil*
Other soil macroorganisms					
Folsomia candida	a.s.	Mixed into substrate/ 10% peat content	Chronic 28 d	Mortality and reproduction	NOEC = 587 mg a.s./kg d.w.soil
Folsomia candida	AMPA	Mixed into substrate/ 5% peat content	Chronic 28 d	Mortality and reproduction	NOEC = 315 mg a.s./kg d.w.soil
Folsomia candida	MON 52276	Mixed into substrate/ 5% peat content	Chronic 28 d	Mortality and reproduction	NOEC = 1802 mg a.s./kg d.w. soil

Test organism	Test substance	Application method of test a.s./ OM[1]	Time scale	End point	Toxicity
Hypoaspis aculeifer	a.s.	Mixed into substrate/ 5% peat content	Chronic 14 d	Mortality and reproduction	NOEC = 473 mg a.s./kg d.w.soil
Hypoaspis aculeifer	AMPA	Mixed into substrate/ 5% peat content	Chronic 14 d	Mortality and reproduction	NOEC = 320 mg a.s./kg d.w.soil
Hypoaspis aculeifer	MON 52276	Mixed into substrate/ 5% peat content	Chronic 14 d	Mortality and reproduction	NOEC = 1802 mg a.s./kg d.w.soil

[1]To indicate whether the test substance was oversprayed/to indicate the organic content of the test soil (e.g. 5 % or 10 %).
*Study considered as supportive.

Higher tier testing (e.g. modelling or field studies)

Nitrogen transformation	a.s.	< 25% effect at Day 28 at 33.1 mg/kg dry soil *
Nitrogen transformation	MON 52276	< 25% effect at Day 28 at 28.8 mg a.e./kg dry soil
Nitrogen transformation	AMPA	< 25% effect at Day 28 at 160 mg/kg dry soil (supportive**)

* Data gap: applicant to provide clarification related to the lack of nitrate measurement at day 7 in none of the treatments including control.
** Datagap: applicant to submit soil nitrogen transformation rate expressed in mg nitrate/kg dry weight soil/day between each measurement day

Toxicity/exposure ratios for soil organisms

Risk envelope covering all representative uses at 3600 g a.s./ha x 1

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
E. fetida	a.s.	Chronic	5.123 (accu)	92.3	5
E. fetida	MON 52276	Chronic	5.123 (accu)	7.4	5
E. fetida	AMPA	Chronic	6.845 (accu)	19.3	5

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Other soil macroorganisms					
F. candida	a.s.	Chronic	5.123 (accu)	114.6	5
F. candida	MON 52276	Chronic	5.123 (accu)	351.7	5
F. candida	AMPA	Chronic	6.845 (accu)	46.0	5
H. aculeifer	a.s.	Chronic	5.123 (accu)	92.3	5
H. aculeifer	MON 52276	Chronic	5.123 (accu)	351.7	5
H. aculeifer	AMPA	Chronic	6.845 (accu)	46.7	5

[1]indicate which PEC soil was used (e.g. plateau PEC)

Effects on terrestrial non target higher plants (Regulation (EU) N° 283/2013, Annex Part A, point 8.6 and Regulation (EU) N° 284/2013 Annex Part A, point 10.6)

Screening data

Not required for herbicides or plant growth regulators as ER_{50} tests should be provided

Laboratory dose response tests

Species	Test substance	ER_{50} (g/ha)[2] vegetative vigour	ER_{50} (g/ha)[2] emergence	Exposure[1] (g/ha)[2]	TER	Trigger
Soybean, Lettuce, Radish, Tomato, Cucumber, Cabbage, Oat, Ryegrass, Corn, Onion	Glyphosate	145.7 (tomato, dry weight)*	-	-	-	-
Cucumis sativus *Brassica napus* *Raphanus sativus* *Glycine max* *Helianthus annuus* *Lycopersicon esculentum* *Zea mays* *Triticum aestivum* *Avena sativa* *Allium cepa*	MON 52276	-	> 3610 g a.s./ha	3 x 720 g a.s./ha	>181	5
				2 x 1440 g a.s./ha	>90.5	
				2 x 1800 g a.s./ha	>72.4	
Zea mays *Avena sativa* *Allium cepa* *Triticum aestivum* *Cucumis sativus* *Brassica napus* *Raphanus sativus* *Glycine max* *Helianthus annuus*	MON 52276	28.4 g a.s./ha** (cucumber, shoot length)	-	3 x 720 g a.s./ha	**1.42**	5
					6.92 (5m)	
					9.97 (50% drift red.)	

Species	Test substance	ER_{50} (g/ha)[2] vegetative vigour	ER_{50} (g/ha)[2] emergence	Exposure[1] (g/ha)[2]	TER	Trigger
Lycopersicon esulentum				2 x 1440 g a.s./ha	**0.71**	5
					3.46 (5m)	
					6.80 (10m)	
					1.42 (50% drift red.)	
					6.92 (5m + 50% drift red.)	
					2.85 (75% drift red.)	
					13.84 (5m + 75% drift red.)	
					7.12 (90% drift red.)	
				2 x 1800 g a.s./ha	**0.57**	5
Zea mays *Avena sativa* *Allium cepa* *Triticum aestivum* *Cucumis sativus#* *Brassica napus* *Raphanus sativus* *Glycine max* *Helianthus annuus* *Lycopersicon esulentum*	MON 52276	69.87 g a.s./ha (*Lycopersicon esculentum* (tomato), shoot fresh weight)	-		**2.77** (5m)	
					5.44 (10m)	
					1.14 (50% drfit red.)	
					5.54 (5m + 50% drfit red.)	
					2.28 (75% drift red.)	
					11.07 (5m + 75% drift red.)	
					5.70 (90% drift red.)	
Extended laboratory studies :						

Species	Test substance	ER_{50} (g/ha)[2] vegetative vigour	ER_{50} (g/ha)[2] emergence	Exposure[1] (g/ha)[2]	TER	Trigger
Semi-field and field test:						

[1] explanation of how exposure has been estimated should be provided (e.g. based on Ganzelmeier drift data)
[2] for preparations indicate whether dose is expressed in units of a.s. or preparation
*ER50 is provisional. Data gap set for ECx values for phytotoxicity
** Study considered supportive. However, since data for cucumber are not reliable in the other vegetative vigor study, the results of both vegetative vigor studies were considered together and the smallest endpoint of 28.4 g a.s./ha was used in the risk assessment.
# results for *Cucumis sativus* (cucumber) are not reliable

Effects on biological methods for sewage treatment (Regulation (EU) N° 283/2013, Annex Part A, point 8.8)

Test type/organism	end point
Activated sludge	EC_{50} > 100 mg a.e./L
Pseudomonas sp	No data

Monitoring data (Regulation (EU) N° 283/2013, Annex Part A, point 8.9 and Regulation (EU) N° 284/2013, Annex Part A, point 10.8)

Available monitoring data concerning adverse effect of the a.s.
No data

Available monitoring data concerning effect of the PPP.
No data.

Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2) Ecotoxicologically relevant compounds[1]

Compartment	
soil	Parent (glyphosate), Metabolite 1 (AMPA)
water	Parent (glyphosate), Metabolite 1 (AMPA*)
sediment	Parent (glyphosate), Metabolite 1 (AMPA*)
groundwater	Parent (glyphosate), Metabolite 1 (AMPA*)

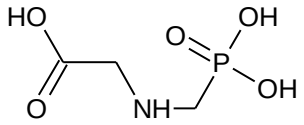
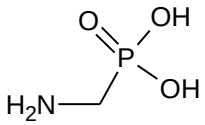
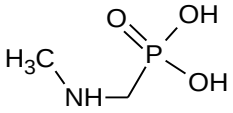
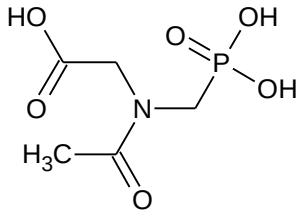
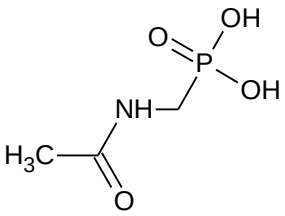
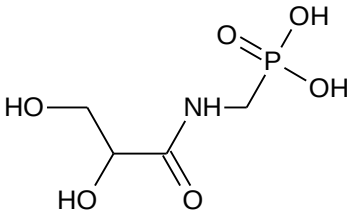
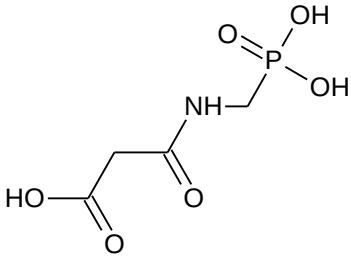
[*] AMPA is not ecotoxicologically relevant for the compartments water, sediment and groundwater. For precautionary reasons AMPA is proposed as relevant residue due to the frequent detections in surface waters and groundwater and the widespread intended uses of glyphosate in almost all crops.

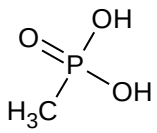
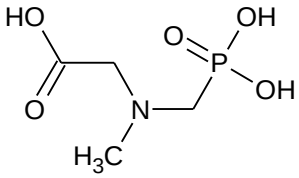
Classification and labelling with regard to ecotoxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

Substance	glyphosate
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][9]:	H411
Peer review proposal[10] for harmonised classification according to Regulation (EC) No 1272/2008:	H411

[9] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[10] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Used compounds code(s)		
Code Number (Synonyms)	**(IUPAC name /SMILES notation /InChiKey)**	**Structural formula**
Glyphosate -Parent	IUPAC/CA name: N-(phosphonomethyl)glycine PMG CP 67573 SMILES notation: OC(=O)CNCP(=O)(O)O	
AMPA - QSAR number M02	IUPAC/CA name: Aminomethylphosphonic acid CP 50435 SMILES notation: NCP(=O)(O)O	
N-methyl AMPA - QSAR number M03	IUPAC/CA name: [(Methylamino)methyl]phosphonic acid CP 70948 SMILES notation: CNCP(=O)(O)O	
N-acetyl glyphosate - QSAR number M04	IUPAC/CA name: N-acetyl-N-(phosphonomethyl)glycine SMILES notation: OC(=O)CN(CP(=O)(O)O)C(C)=O	
N-acetyl AMPA - QSAR number M05	IUPAC/CA name: [(Acetylamino)methyl]phosphonic acid SMILES notation: CC(=O)NCP(=O)(O)O	
N-glyceryl AMPA - QSAR number M06	IUPAC/CA name: (2,3-dihydroxypropanoyl-amino)methylphosphonic acid SMILES notation: O=C(NCP(=O)(O)O)C(O)CO	
N-malonyl AMPA - QSAR number M07	IUPAC/CA name: 3-oxo-3-(phosphonomethyl-amino)propanoic acid SMILES notation: O=C(CC(=O)O)NCP(=O)(O)O	

Methyl-phosphonic acid - QSAR number M08	IUPAC/CA name: Methylphosphonic acid SMILES notation: CP(=O)(O)O	
N-methyl glyphosate - QSAR number M09	IUPAC/CA name: 2-[methyl(phosphonomethyl)amino]acetic acid SMILES notation: CN(CC(=O)O)CP(=O)(O)O	
HMPA - QSAR number M10	IUPAC/CA name: Hydroxymethylphosphonic acid SMILES notation: OCP(=O)(O)O