The evaluation of a new MRL for potassium phosphonates in or on asparagus

UK Competent Authority Evaluation Report and Reasoned Opinion

- Prepared under Article 8 of Assimilated Regulation 396/2005 and Data Requirements of Assimilated Regulation 544/2011
- Application Reference Number: COP 2025/01217

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Contents

Summary

In accordance with Article 6 of Assimilated Regulation 396/2005,[1] HSE received an application on 2 April 2026 to amend the existing MRL for the active substance potassium phosphonates in or on asparagus. The application was to support a proposed extension of authorisation for a minor use.

The applicant submitted a dossier in accordance with the data requirements outlined in Assimilated Regulation 544/2011.

In accordance with Article 8 of Assimilated Regulation 396/2005, HSE evaluated the dossier in accordance with the uniform principles as outlined in Article 29(6) of Assimilated Regulation 1107/2009.[2]

Based on the assessment HSE prepared an Evaluation Report that included its Reasoned Opinion on the risk to consumers associated with amending the MRL. HSE also took into account the data assessed for the approval of the active substance and previous Reasoned Opinions.

Sufficiently validated analytical methods for the determination of phosphonic acid in products of plant origin, in line with the residue definition for enforcement, are available to support the uses under consideration in the MRL application.

Toxicological reference values were established for the approval of the active substance: an ADI of 2.25 mg/kg bw/day and no ARfD allocated or required.

The metabolism of potassium phosphonates has been widely reported in scientific journals and summarised for the approval of the active substance (EFSA Conclusion, 2012a). As a consistent metabolic pathway was observed from well documented scientific publications, the available data is sufficient to support all crop groups.

The residue definition for risk assessment (RD-RA) in plants and animals has been agreed as:

- Phosphonic acid and its salts expressed as phosphonic acid

The residue definition for enforcement (RD-Enf) in plants and animals has been agreed as:

[1] Assimilated Regulation No 396/2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin

[2] Assimilated Regulation No 1107/2009 concerning the placing of plant protection products on the market

- Sum of fosetyl, phosphonic acid and their salts expressed as fosetyl

Five outdoor trials on asparagus conducted in UK and Germany were submitted to support an MRL for asparagus. One trial was omitted as the trial site was treated with fertiliser containing mono and di potassium phosphonates prior to the trial. The trials are supported by validated analytical methods and storage stability data.

Hydrolysis of phosphonic acid under representative conditions of pasteurisation, baking, brewing, boiling and sterilisation was evaluated for the approval of the active substance fosetyl. The hydrolysis data demonstrate that phosphonic acid is stable under standard conditions, therefore specific residue definitions for processed commodities are not required.

No consideration of residues in rotational crops is required, as the proposed use is on asparagus which is considered to be permanent/semi-permanent.

No consideration of the dietary burden is required as the crop is not used as animal feedstuffs.

The highest UK NEDI was 74% of the ADI (toddler). The highest PRIMo IEDI was 44% of the ADI (DE child). Therefore, no health effects due to chronic exposure are expected from the consumption of commodities treated with potassium phosphonates.

Consideration of acute exposure was not required as the active substance is not acutely toxic and an ARfD has not been allocated.

HSE concludes that sufficient data have been provided to support the setting of a new MRL for the proposed use of potassium phosphonates on asparagus. This will not result in consumer exposures exceeding the toxicological reference values and therefore harmful effects on human health are not expected. HSE recommends that the MRL outlined in Table 0.1 is amended in the GB MRL Statutory Register.

Table 0.1 MRL recommended by HSE
Enforcement residue definition for products of plant origin: Sum of fosetyl, phosphonic acid and their salts expressed as fosetyl

Product code	Product	Existing GB MRL (mg/kg)	New or amended GB MRL (mg/kg)	Comments
0270010	Asparagus	2*	30	The MRL is sufficiently supported by data. No health effects are expected.

Background

Assimilated Regulation 396/2005 outlines the rules for setting MRLs in GB. Article 6 covers the submission of applications for MRLs, including the parties which can submit an application. Article 7 outlines that a dossier in accordance with the data requirements of Assimilated Regulation 1107/2009 must be provided.

On 2 April 2026, HSE accepted an application to set a new MRL for potassium phosphonates in or on asparagus. The application was to support an extension of authorisation for a minor use.

HSE evaluated the information submitted to uniform principles, as defined by Article 8 of Assimilated Regulation 396/2005 and prepared an Evaluation Report. HSE also took into account EFSA Reasoned Opinions and Conclusions on the peer review relating to decisions implemented in GB.

The Evaluation Report is the basis of HSE’s Reasoned Opinion.

The active substance and its use pattern

Information on potassium phosphonates are outlined in Table 0.2.

Table 0.2 Information on the active substance

Common name (ISO)	Potassium phosphonates
Chemical name (IUPAC)	Potassium hydrogen phosphonate Dipotassium phosphonate
CAS number	13598-36-2
Structural formula	
Molecular formula	KH_2PO_3 [$HPO(OH)(O$-K+)] and K_2HPO_3 [$HPO(O$-K+$)_2$]
Molecular mass	monopotassium phosphonate: 120.1 g/mol dipotassium phosphonate: 158.2 g/mol

Potassium phosphonates are an approved active substance in GB. The MRLs for fosetyl-Al apply to potassium phosphonates. An EFSA Conclusion is available for potassium phosphonates (EFSA, 2012). Fosetyl MRLs were reviewed under Article 12 of Regulation (EC) No 396/2005 (EFSA, 2012b). MRLs are established for fosetyl in Part 3 of the GB MRL Statutory Register.

Appendix A outlines the GAPs (Good Agricultural Practices) supported in this application.

There is no CXL available for potassium phosphonates for asparagus.

Assessment

1 Methods of analysis

1.1 Methods for enforcement and monitoring of residues in food of plant origin

The residue definition for enforcement is the sum of fosetyl, phosphonic acid and their salts expressed as fosetyl. For potassium phosphonates, phosphonic acid only is the relevant residue and this is then expressed as fosetyl for MRL setting.

Analytical methods for the determination of phosphonic acid in plant commodities were assessed for the approval of the active substance (EFSA Conclusion, 2012).

A HPLC-MS/MS method has been validated for the high water, high acid, high oil and dry/starch commodity groups with an LOQ of 0.5 mg/kg. Acceptable ILV data on high water and high acid crops were provided. As the analytical method is the same for the four groups including dry/starch commodities, and the method did not involve controlled pH extraction, the ILV available is considered acceptable to be used for enforcement for the crops proposed.

Specific plant metabolism studies were not evaluated for the approval of potassium phosphonates. Plant metabolism data are available for fosetyl, and in general extraction of residues, including phosphonic acid, was achieved using aqueous based solutions which were similar to the extraction solvents employed in the analytical methods, although there are some differences in respect to the organic solvents employed and the ratios of water to organic solvent. In principle further data are required to address the extraction efficiency. However, the lack of data are unlikely to impact the MRL calculated or the outcome of the consumer risk assessment. Therefore, no further data are required at this time.

The crop under consideration in the MRL application is asparagus (high water) and is therefore covered by the analytical methods available.

1.2 Methods for enforcement and monitoring of residues in food of animal origin

Not required as the MRL application does not require the setting or amendment of MRLs in products of animal origin.

2 Mammalian toxicology

The toxicological end points established for the approval of the active substance are summarised in Table 2.1.

Table 2.1 Overview of the toxicological reference values for [parent]

TRVs	Source	Year	Value	Study relied upon	Safety factor
ADI	EFSA	2013	2.25 mg/kg bw/d	Rat, acute neurotoxicity	100
ARfD	EFSA	2010	Not allocated	No ARfD necessary	Not applicable

3 Residues in plants

3.1 Nature of residues in primary crops

Metabolism in primary crops was investigated the approval of potassium phosphonates and the following summary was presented (EFSA Conclusion, 2012a):

"*Scientific publications on the uptake and distribution of phosphonates (phosphonic acid) in plants as well as information from research on fertiliser properties of phosphonates versus phosphate have been submitted to address the metabolism of potassium phosphonates in plants. This information indicates that phosphonates are translocated through the entire plant after soil or foliar application and that phosphonates are not significantly oxidised in plants to phosphate. This suggests that phosphonates do not act as a phosphorus source in plants. The experts of the PRAPeR 09 expert meeting assumed that given the elementary nature of this active substance only transformation of the potassium phosphonate salts into phosphonic acid is expected in plants, and agreed that the available data from the public literature were sufficient to address the uptake and metabolism of potassium phosphonates in plants. The meeting of experts also discussed the possibility of another route of exposure to phosphonic acid residues resulting from the use of soil fertilisers and of fosetyl and disodium phophonate. However, for fertilising purposes, only phosphorous(V) and not phosphorous(III) is relevant and therefore the contribution of phosphonic acid in plants resulting from the use of soil fertilisers does not have to be considered. The proposed residue definition for monitoring and risk assessment is phosphonic acid and its salts expressed as phosphonic acid*."

As a consistent metabolic pathway was observed from well documented scientific publications, the available data is sufficient to support all crop groups. The application type in the studies is foliar spray, which is the same as the application type for the proposed use. On this basis the crops included in this MRL application are supported by the available metabolism studies.

The RD-RA in plants has been agreed as:

- Phosphonic acid and its salts expressed as phosphonic acid

The RD-Enf has been agreed as:

- Fosetyl-Al (sum of fosetyl, phosphonic acid and their salts, expressed as fosetyl)

As the RD-RA and RD-Enf are different the following molecular weight conversion factor has been applied to express residues as fosetyl equivalents:

- Molecular weight conversion: 1.34

The molecular mass of fosetyl is 110 g/mol. The molecular mass of phosphonic acid is 82 g/mol. Therefore, to express phosphonic acid residues as fosetyl a molecular weight conversion factor of 1.34 is applied (110/82).

3.2 Magnitude of residues in primary crops

The uses notified in the MRL application are outlined in Appendix A.

Residue trials

0270010 Asparagus

The critical GAP for GB is 4 x 1368 g potassium phosphonates/ha (912 g phosphonic acid/ha) with a RTI of 7 days. A PHI is not defined but is expected to be > 200 days.

The applications may be made to establishing crops or established crops, in both cases, the treated portion of the plant is not consumed. Each case is explained briefly below:

- **Establishing crops** – application from 1 May to end of September. Establishing crops will not be harvested in the year of treatment – treated crop parts will die back in winter. The first crop of asparagus may be harvested in the following year from new growth.

- **Established crops** – application from end of harvest (early summer/June) to end of September. Treated crops will die back in winter. The next crop of asparagus will be taken in the following year from new growth.

Five outdoor trials on asparagus were undertaken in UK and Germany (NEU and reflecting the agronomic and climatic conditions in the UK) using an SC formulation, as tabulated below. The trials were conducted at 4 x 912 g a.s./ha (as phosphonic acid), the BBCH for the first application was after normal commercial harvest and the final application was BBCH 89-99. The final application was made from late September to late October, this is considered sufficiently reflective of the GAP.

The PHI was 212-249 days (212-229 days for the trials considered supportive of the GAP), and the RTI was 14 days. The trials are within 25% of the cGAP for ‘Frutogard’ with the exception of RTI. The trials do not reflect the proposed RTI of 7 days (as they are not within 25%). The RTI in the trials was 14 days. However, this deviation in the trial parameter compared to the GAP is unlikely to impact the residue levels given the long PHI (212-229 days) and given the application is after the consumable part of the crop has been harvested as the crop moves towards senescence. Overall, it can be concluded that the trials reflect the proposed GAP

A number of deviations were noted in these trials. In most cases these were minor or were considered not to affect the validity of the trial, such as issues with retained samples (sample timings and amounts), minor exceedances of storage temperature for the test item, a 19 day retreatment interval in a single trial (rather than 14 day) and a reduced sample size. Details of trial deviations are given in section C.3.1.2

One trial noted high levels of residue in control samples and it was confirmed that 6 months prior to the trial, 2 applications of fertiliser containing mono and di potassium phosphonates was added to the soil. For this reason the trial was discounted and was not considered supportive of the proposed GAP.

All individual studies submitted in the framework of the MRL application are reported and assessed in detail in Appendix C.3.2

Storage stability

Sufficient storage stability in high water commodities (25 months for cucumber, cabbage and potato) is available in the DAR to support the maximum storage period of 20 months in the trials on asparagus (high water).

Analytical methods

Analysis for residues of potassium phosphonates was using an LC-MS/MS method described in report S21-08060. The analytical method was considered sufficiently validated for the purposes of the regulatory process. The full details of the assessment are outlined in section C.1.3.

Extraction efficiency was not investigated during the method validation. This method uses predominantly methanol: water (50:50 v/v) as the extraction solvent which is similar to the solvent used in the metabolism studies to extract phosphonic acid (Fosetyl DAR). In principle further data are required. However, the lack of data are unlikely to impact the MRL calculated or the outcome of the consumer risk assessment. Therefore, no further data are required at this time.

Table 3.2 Overview of the available residue trials data

RD-RA: Phosphonic acid and its salts expressed as phosphonic acid

RD-Enf: Fosetyl-Al expressed (sum of fosetyl, as fosetyl phosphonic acid and their Salts)

Commodity	Region/ Indoor (a)	Residue levels (mg/kg) observed in the trials representative for the intended GAPs (b)	Recommendations / comments (OECD calculations)	MRL proposals (mg/kg)	HR (mg/kg) (c)	STMR (mg/kg) (d)
Asparagus GAP in residue trials: (4 x 912 g/ha as phosphonic acid (4 x 1.368 kg/ha potassium phosphonates), RTI 7 days)	GB / Outdoor	RD-Enf: 1.89, 4.77, 5.47, 12.38 RD-RA: 1.41, 3.56, 4.08, 9.24	MRL_{OECD}: 23.92 / 30	30	(12.38) 9.24	(5.12) 3.82

(a) GB or the country for an import tolerance and whether the GAP is for an outdoor use or an indoor/protected/glasshouse use.

(b) Residue levels in trials conducted according to GAPs reported in ascending order. When residue definitions for enforcement and risk assessment differ, **Enf/RA** differentiate data expressed according to the residue definition for **Enf**orcement and **R**isk **A**ssessment.

(c) **HR**: Highest residue, according to the residue for risk assessment, (within brackets when expressed according to the residue definition for enforcement: HR_{Enf})

(d) **STMR**: Supervised Trials Median Residue according to the residue definition risk assessment (within brackets when expressed according to the residue definition for enforcement: $STMR_{Enf}$)

3.3 Conversion factors for risk assessment for products of plant origin

The RD-RA and RD-Enf are expressed differently but do not include any additional analytes for phosphonic acid. As such a CF for enforcement to risk assessment is not relevant.

However, to address the differences in the way the residues are expressed for enforcement compared to risk assessment, a molecular weight conversion factor is applied.

The residue trials submitted for this MRL application analysed for phosphonic acid, in accordance with the residue definition for risk assessment. A molecular weight conversion factor of 1.34 to convert RD-RA to RD-Enf (Fosetyl: 110 g/mol, phosphonic acid: 82 g/mol) has been applied. If residues from enforcement are expressed as fosetyl, then a molecular weight conversion factor of 0.746 can be employed to express the residues as phosphonic acid for risk assessment.

3.4 Effect of industrial processing and/or household preparation

3.4.1 Nature of the residues in processed commodities

Hydrolysis of phosphonic acid under representative conditions of pasteurisation, baking, brewing, boiling and sterilization was evaluated for the approval of fosetyl (EFSA Fosetyl RO, 2006).

A summary of the available hydrolysis data from the DAR (France, 2005) is presented in the EFSA fosetyl/phosphonic acid RO, 2020 and copied below:

“The effect of processing on the nature of phosphonic acid was investigated in the framework of the EU pesticides peer reviews for potassium phosphonates and fosetyl (EFSA, 2012b, EFSA, 2018c). These studies showed that phosphonic acid is hydrolytically stable under standard processing conditions representative of pasteurisation, baking/brewing/boiling and sterilisation.”

The hydrolysis data demonstrates that the metabolite of potassium phosphonates (phosphonic acid) is stable across the standard conditions, therefore specific residue definitions for processed commodities are not required.

3.4.2 Magnitude of the residues in processed commodities

No consideration of residues in processed commodities is required, as the total theoretical maximum daily intake (TMDI) is less than 10 % of the ADI.

3.5 Rotational crops

No consideration of residues in rotational crops is required, as the proposed use is on asparagus which is considered to be permanent/semi-permanent

4 Residues in livestock

No consideration of residues in products of animal origin is required as the crops are not used as animal feedstuffs.

5 Residues in honey

No consideration of residues in honey is required as the application is to ‘old’ data requirements set out under Assimilated Regulation No. 544/2011.

6 MRLs for products not covered in Sections 3 and 4

This section is to cover MRLs that can be extrapolated to other products included in Part 1 of the GB MRL Statutory Register but are not covered in Sections 3 and 4 of this ER/RO. Examples include MRLs for edible offals (other than liver and kidney) or MRLs to cover products derived from other species such as goat or equine.

No MRL extrapolations are recommended on the basis of this assessment.

7 Consumer risk assessment

7.1 Dietary exposure

Dietary exposures have been estimated using the UK chronic model and the EFSA PRIMo.

Chronic dietary exposures have been estimated based on the uses of potassium phosphonates considered in this application, the uses considered in previous assessments supporting existing GB MRLs (HSE, 2026) and, for the remaining commodities, the existing MRLs established in the GB MRL Statutory Register.

Consideration of acute exposure is not required as the active substance is not acutely toxic and an ARfD has not been allocated.

UK NEDIs

The UK NEDIs for the active substance and commodities listed in Table 7.1-1 have been estimated for ten consumer groups using the UK chronic model (versions 1.1) as detailed in Regulatory Update 21/2005. The following assumptions have been made:

- For the NEDIs, the 'Rees-Day' approach is taken which sums the two highest 97.5th percentile intakes and the mean intakes for all remaining commodities.
- All produce eaten which may have been treated has been treated and contains residues at the levels given in Table 7.1-1.
- There is no loss of residue during transport, storage or processing of foods prior to consumption.

Table 7.1-1 Input values for the UK consumer risk assessment
RD-RA: Phosphonic acid and its salts expressed as phosphonic acid

Commodity	Chronic risk assessment	
	Input (mg/kg)	Comment
Tree nuts	64.50	$STMR_{RA}$ (EFSA 2018a)
Pome fruit	23.20	$STMR_{RA}$ (EFSA 2018a)
Peaches	12.51	$STMR_{RA}$ (EFSA 2018a)
Grapes	25.0	$STMR_{RA}$ (EFSA, 2012a)

Commodity	**Chronic risk**	**assessment**
	Input (mg/kg)	**Comment**
Currants, blueberries, gooseberries	18.40	$STMR_{RA}$ (EFSA, 2018b)
Raspberries and blackberries	58.20	$STMR_{RA}$ (EFSA, 2018b)
Kiwi fruits (green, red and yellow)	34.5	$STMR_{RA}$ (HSE, 2022)
Mangoes	38.5	$STMR_{RA}$ (HSE, 2025)
Cucumbers	14.0	$STMR_{RA}$ (CXL, 2018)
Courgettes	25.5	$STMR_{RA}$ (CXL, 2018)
Melon	14.0	$STMR_{RA}$ (CXL, 2018)
Lettuce	41.0	$STMR_{RA}$ (CXL, 2018)
Cress, lettuce (surrogate for lambs lettuce), spinach, chicory, parsley	57.4	$STMR_{RA}$ (HSE, 2024)
Garlic and shallots	4.40	$STMR_{RA}$ (HSE 2024)
Florence fennel	0.32	$STMR_{RA}$ (EFSA 2015)
Asparagus	**3.82**	**$STMR_{RA}$ (current assessment)**
Beans without pods	24.3	$STMR_{RA}$ (HSE, 2024)
Potatoes	26.90	$STMR_{RA}$ (HSE, 2021)
Wheat	23.13	$STMR_{RA}$ (HSE, 2023)
Poultry	0.50	$STMR_{RA}$ (HSE, 2023)
Meat fat	0.50	$STMR_{RA}$ (HSE, 2023)
Meat excl. poultry & offal	0.50	$STMR_{RA}$ (HSE, 2023)
All types of kidney	2.23	$STMR_{RA}$ (HSE, 2023)
All types of liver	0.50	$STMR_{RA}$ (HSE, 2023)
Other types of offal	2.23	$STMR_{RA}$ (HSE, 2023)
Eggs	0.50	$STMR_{RA}$ (HSE, 2023)
Milk	0.13	$STMR_{RA}$ (HSE, 2023)

Commodity	Chronic risk assessment	
	Input (mg/kg)	Comment
All other commodities	MRL (expressed as phosphonic acid)	GB Statutory Register (GB MRL 2026/001)

In bold uses proposed as part of the current assessment.

Model outputs for the UK chronic model (version 1.1) is presented in Appendix B.

PRIMo

The PRIMo IEDIs and IESTIs for the active substance and commodities listed in Table 7.1-2 have been estimated using PRIMo revision 3.1 – Pesticide Residues Intake Model.

The following assumptions have been made:

- All produce eaten which may have been treated, has been treated and contains residues at the levels as given in Table 7.1-2.
- There is no loss of residue during transport, storage or processing of foods prior to consumption.

The input values for the PRIMo risk assessment are given in Table 7.1-2.

Table 7.1-2 Input values for the PRIMo consumer risk assessment
RD-RA: Phosphonic acid and its salts expressed as phosphonic acid

Commodity	Chronic risk assessment	
	Input (mg/kg)	Comment
Honey	10.37	$STMR_{RA}$ (HSE, 2026)
Tree nuts	64.50	$STMR_{RA}$ (EFSA 2018a)
Pome fruit	23.20	$STMR_{RA}$ (EFSA 2018a)
Peaches	12.51	$STMR_{RA}$ (EFSA 2018a)
Grapes	25.0	$STMR_{RA}$ (EFSA, 2012a)
Raspberries and blackberries	58.20	$STMR_{RA}$ (EFSA, 2018b)
Currants, blueberries, gooseberries	18.40	$STMR_{RA}$ (EFSA, 2018b)

Commodity	Chronic risk assessment	
	Input (mg/kg)	Comment
Raspberries and blackberries	34.5	$STMR_{RA}$ (EFSA, 2018b)
Kiwi fruits (green, red and yellow)	38.5	$STMR_{RA}$ (HSE, 2022)
Mangoes	26.90	$STMR_{RA}$ (HSE, 2025)
Asparagus	**3.82**	**$STMR_{RA}$ (current assessment)**
Potatoes	26.90	$STMR_{RA}$ (HSE, 2021)
Celeriac	0.20	$STMR_{RA}$ (EFSA 2015)
Garlic and shallots	4.40	$STMR_{RA}$ (HSE. 2024)
Cucumbers	14.0	$STMR_{RA}$ (CXL, 2018)
Courgettes	25.5	$STMR_{RA}$ (CXL, 2018)
Melons extrapolated to all cucurbits with inedible peel - pumpkins, watermelons, other	14.0	$STMR_{RA}$ (CXL, 2018)
Lettuce	41.0	$STMR_{RA}$ (CXL, 2018)
Lamb's lettuces/corn salads, escaroles/broad-leaved endives, cresses and other sprouts and shoots, land cresses, Roman rocket/rucola, red mustards, baby leaf, Spinach, purslane, herbs and edible flowers	57.4	$STMR_{RA}$ (HSE, 2024)
Beans without pods	24.3	$STMR_{RA}$ (HSE, 2024)
Florence fennel	0.32	$STMR_{RA}$ (EFSA, 2015)
Wheat	23.13	$STMR_{RA}$ (HSE, 2023)
Coffee beans	8.6	$STMR_{RA}$ (HSE, 2022)
Spices	74.0	$STMR_{RA}$ (EFSA, 2018b)
Swine - Meat	0.50	$STMR_{RA}$ (HSE, 2023)
Swine - Fat (free of lean meat)	0.50	$STMR_{RA}$ (HSE, 2023)
Swine - Liver	0.50	$STMR_{RA}$ (HSE, 2023)
Swine - Kidney	1.66	$STMR_{RA}$ (HSE, 2023)
Swine – Edible offals (other than liver and kidney)	1.66	$STMR_{RA}$ (HSE, 2023)

Commodity	Chronic risk assessment	
	Input (mg/kg)	**Comment**
Swine - Other	0.50	$STMR_{RA}$ (HSE, 2023)
Bovine - Meat	0.50	$STMR_{RA}$ (HSE, 2023)
Bovine - Fat	0.50	$STMR_{RA}$ (HSE, 2023)
Bovine - Liver	0.50	$STMR_{RA}$ (HSE, 2023)
Bovine - Kidney	2.12	$STMR_{RA}$ (HSE, 2023)
Bovine – Edible offals (other than liver and kidney)	2.12	$STMR_{RA}$ (HSE, 2023)
Bovine - Other	0.50	$STMR_{RA}$ (HSE, 2023)
Sheep - Meat	0.50	$STMR_{RA}$ (HSE, 2023)
Sheep - Fat	0.50	$STMR_{RA}$ (HSE, 2023)
Sheep - Liver	0.50	$STMR_{RA}$ (HSE, 2023)
Sheep - Kidney	2.23	$STMR_{RA}$ (HSE, 2023)
Sheep - Edible offals (other than liver and kidney)	2.23	$STMR_{RA}$ (HSE, 2023)
Sheep - Other	0.50	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals - Muscle/meat	0.50	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals - Fat	0.50	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals - Liver	0.50	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals – Kidney	2.23	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals - Edible offals (other than liver and kidney)	2.23	$STMR_{RA}$ (HSE, 2023)
Goat, equine. Other terrestrial animals - Other	0.50	$STMR_{RA}$ (HSE, 2023)
Poultry - Muscle/meat	0.50	$STMR_{RA}$ (HSE, 2023)
Poultry - Fat	0.50	$STMR_{RA}$ (HSE, 2023)
Poultry - Liver	0.50	$STMR_{RA}$ (HSE, 2023)

Commodity	Chronic risk assessment	
	Input (mg/kg)	**Comment**
Poultry - Kidney	0.50	$STMR_{RA}$ (HSE, 2023)
Poultry - Edible offals (other than liver and kidney)	0.50	$STMR_{RA}$ (HSE, 2023)
Poultry - Other	0.50	$STMR_{RA}$ (HSE, 2023)
Milk incl. cattle, sheep, goat, horse, other	0.13	$STMR_{RA}$ (HSE, 2023)
Birds eggs Incl. chicken, duck, geese, quail, other	0.50	$STMR_{RA}$ (HSE, 2023)
All other commodities	MRL (expressed as phosphonic acid)	GB Statutory Register (GB MRL 2026/001)

In bold uses proposed as part of the current assessment.

Model outputs for EFSA PRIMo revision 3.1 are presented in Appendix B.

Conclusions
The highest UK NEDI was 74% of the ADI (toddler).

The highest PRIMo IEDI was 44% of the ADI (DE child). Therefore, no health effects due to chronic exposure are expected from the consumption of asparagus treated with potassium phosphonates.

Consideration of acute exposure was not required as the active substance is not acutely toxic and an ARfD has not been allocated.

7.2 Other routes of exposure

Not applicable

8 The conclusion of the competent authority

Sufficiently validated analytical methods for the determination of phosphonic acid in products of plant origin, in line with the residue definition for enforcement, are available to support the uses under consideration in the MRL application.

Toxicological reference values were established for the approval of the active substance: an ADI of 2.25 mg/kg bw/day and no ARfD allocated or required.

The metabolism of potassium phosphonates has been widely reported in scientific journals and summarised for the approval of the active substance (EFSA Conclusion, 2012a). As a consistent metabolic pathway was observed from well documented scientific publications, the available data is sufficient to support all crop groups.

The residue definition for risk assessment (RD-RA) in plants and animals has been agreed as:

- Phosphonic acid and its salts expressed as phosphonic acid

The residue definition for enforcement (RD-Enf) in plants and animals has been agreed as:

- Sum of fosetyl, phosphonic acid and their salts expressed as fosetyl

Five outdoor trials on asparagus conducted in UK and Germany were submitted to support an MRL for asparagus. One trial was omitted as the trial site was treated with fertiliser containing mono and di potassium phosphonates prior to the trial. The trials are supported by validated analytical methods and storage stability data.

Hydrolysis of phosphonic acid under representative conditions of pasteurisation, baking, brewing, boiling and sterilisation was evaluated for the approval of the active substance fosetyl. The hydrolysis data demonstrate that phosphonic acid is stable under standard conditions, therefore specific residue definitions for processed commodities are not required.

No consideration of residues in rotational crops is required, as the proposed use is on asparagus which is considered to be permanent/semi-permanent.

No consideration of the dietary burden is required as the crop is not used as animal feedstuffs.

The highest UK NEDI was 74% of the ADI (toddler). The highest PRIMo IEDI was 44% of the ADI (DE child). Therefore, no health effects due to chronic exposure are expected from the consumption of commodities treated with potassium phosphonates.

Consideration of acute exposure was not required as the active substance is not acutely toxic and an ARfD has not been allocated.

HSE concludes that sufficient data have been provided to support the setting of a new MRL for the proposed use of potassium phosphonates on asparagus. This will not result in consumer exposures exceeding the toxicological reference values and therefore harmful effects on human health are not expected. HSE recommends that the MRLs outlined in Table 8.1 is amended in the GB MRL Statutory Register.

Table 8.1 MRL recommended by HSE
Enforcement residue definition for products of plant origin: Sum of fosetyl, phosphonic acid and their salts expressed as fosetyl

Product code	Product	Existing GB MRL (mg/kg)	New or amended GB MRL (mg/kg)	Comments
0270010	Asparagus	2*	30	The MRL is sufficiently supported by data. No health effects are expected.

References

France, 2005a. Draft Assessment Report (DAR) on the active substance potassium phosphite prepared by the rapporteur Member State France in the framework of Directive 91/414/EEC, January 2005.

France, 2005b. Final Addendum to Draft Assessment Report on fosetyl-Al, compiled by EFSA, September 2005.

France, 2003. Draft assessment report (DAR) on the active substance fosetyl prepared by the Rapporteur Member State France in the framework of Council Directive 91/414/EEC, December 2003.

EFSA (European Food Safety Authority), 2006. Conclusion on the peer review of the pesticide risk assessment of the active substance fosetyl. EFSA Journal 2005; 54: 1-79.

EFSA (European Food Safety Authority), 2012a. Peer Review Report to the conclusion regarding the peer review of the pesticide risk assessment of the active substance potassium phosphonates.

EFSA (European Food Safety Authority), 2012b. Reasoned opinion on the review of the existing maximum residue levels (MRLs) for fosetyl according to Article 12 of Regulation (EC) No 396/2005. EFSA Journal 2012; 10(11): 2961.

EFSA (European Food Safety Authority) 2013. Conclusion on the peer review of the pesticide risk assessment of the active substance potassium phosphonates. EFSA Journal 2012;10(12):2963.

EFSA ((European Food Safety Authority) 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance fosetyl. EFSA Journal 2018;16(7):5307.

EFSA (European Food Safety Authority), 2020. Modification of the existing maximum residue levels for fosetyl/Phosphonic acid in various crops. EFSA Journal 2020;18(1):5964

Appendix A – GAPs notified in the MRL application

Crop and/or situation (a)	GB or Country For Import Tolerance	Product name	F,G or I (b)	Pests or Group of pests controlled (c)	Preparation		Application				Application rate per treatment			PHI (days) (m)	Remarks
					Type (d-f)	Conc. a.s. (i)	method kind (f-h)	range of growth stages & season (j)	number min - max (k)	Interval between application (min)	kg a.s /hL min-max (l)	Water (L/ha) min-max	kg a.s./ha min-max (l)		
Asparagus	*GB*	*M19105*	*F*	*Root and crown rot (Phytophthora asparagi)*	*SC*	*342 g/L Potassium Phospho-nates (228 g/L Phos-phonic acid equiva-lents)*	*Horizontal boom sprayer*	***Establishing crops:*** *Application to developing fern from 1 May †* ***Established crops:*** *Application from the end of spear harvest. ‡* ***In both cases:*** *Latest application end September*	*4*	*7 days*	*0.076 - 0.228*	*400 - 1200*	*0.912 kg as/ha (based on 228 g/L phosphonic acid)* *(1.368 kg as/ha as potassium phospho-nates)*	*F*	† Asparagus crops are not harvested in the first 1-2 years of establishing ‡ Established asparagus crops are harvested from spring – early summer In both cases, the treated portion of the crop is not consumed.

(a) For crops, the GB and Codex classifications (both) should be taken into account; where relevant, the use situation should be described (e.g. fumigation of a structure) (b) State if the use is outdoor, field use (F) or glasshouse (G) or indoor use (I). (c) *e.g.* biting and sucking insects, soil borne insects, foliar fungi, weeds (d) *e.g.* wettable powder (WP), emulsifiable concentrate (EC), granule (GR) (e) CropLife International Technical Monograph no 2, 6th Edition. Revised May 2008. Catalogue of pesticide (f) All abbreviations used must be explained (g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench (h) Kind, *e.g.* overall, broadcast, aerial spraying, row, individual plant, between the plant- type of equipment used must be indicated	(i) g/kg or g/L. Normally the rate should be given for the active substance (according to ISO) and not for the variant in order to compare the rate for same active substances used in different variants (e.g. fluroxypyr). In certain cases, where only one variant is synthesised, it is more appropriate to give the rate for the variant (e.g. benthiavalicarb-isopropyl). (j) Growth stage range from first to 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 (k) Indicate the minimum and maximum number of applications possible under practical conditions of use (l) The values should be given in g or kg whatever gives the more manageable number (e.g. 200 kg/ha instead of 200 000 g/ha or 12.5 g/ha instead of 0.0125 kg/ha (m) PHI - minimum pre-harvest interval

Appendix B – UK models and Pesticide Residues Intake Model (PRIMo)

Table B.1 Chronic risk assessment undertaken using UK model version 1.1

Active substance:	Potassium phosphonates	**ADI:**	2.25	mg/kg bw/day	**Source:** EFSA, 2012

	TOTAL INTAKE based on 97.5th percentile									
	ADULT	**INFANT**	**TODDLER**	**4-6 YEARS**	**7-10 YEARS**	**11-14 YEARS**	**15-18 YEARS**	**VEGETARIAN**	**ELDERLY (OWN HOME)**	**ELDERLY (RESIDENTIAL)**
mg/kg bw/day	0.63728	1.11033	1.673111	1.334302	1.44608	0.75256	0.70773	0.72569	0.52235	0.40407
% of ADI	28%	49%	74%	59%	64%	33%	31%	32%	23%	18%

Commodity	**STMR (mg/kg)**	**P**	**COMMODITY INTAKES (mg/kg bw/day)**									
Grapefruit	56.25		0.10843	0.08987	0.32703	0.29689	0.64824	0.11801	0.08199	0.13181	0.13522	0.10930
Lemons	56.25		0.00740	0.03879	0.01784	0.00713	0.00510	0.00422	0.00785	0.01265	0.01843	0.00384
Limes	56.25		0.01562	L/C	0.09155	0.01262	0.00892	0.00891	0.01349	0.01585	0.01931	0.02977
Mandarins	56.25		0.07875	L/C	0.35961	0.20332	0.16529	0.08531	0.09390	0.06629	0.08835	0.03771
Oranges	56.25		0.21701	0.60388	0.92172	0.63082	0.47021	0.44871	0.37215	0.25696	0.20101	0.15368
Almonds	64.5		0.00594	0.02891	0.01334	0.00975	0.00751	0.00524	0.00637	0.00667	0.00601	0.00314
Brazil nuts	64.5		0.00900	L/C	0.01334	0.01007	0.00856	0.00443	0.00303	0.00725	0.00656	L/C

Cashew nuts	64.5		0.01035	L/C	0.03381	0.01133	0.00125	0.00417	0.00273	0.01189	0.01421	0.00073
Chestnuts	64.5		0.00942	L/C	L/C	L/C	L/C	L/C	0.00303	0.01683	0.00993	L/C
Coconuts	64.5		0.00874	0.00593	0.02091	0.01730	0.01211	0.01223	0.00869	0.02485	0.00692	0.00544
Hazelnuts	64.5		0.00696	L/C	0.01379	0.00661	0.00877	0.00443	0.00455	0.00445	0.00392	0.00188
Pecan nuts	64.5		0.00365	L/C	0.00311	L/C	0.00146	0.00524	L/C	0.02360	0.00592	L/C
Pistachios	64.5		0.02461	L/C	0.02135	L/C	0.01586	L/C	L/C	0.00774	L/C	L/C
Walnuts	64.5		0.00806	L/C	0.02669	0.00378	0.00459	0.00336	0.00687	0.01054	0.01130	0.00450
Peanuts	64.5		0.02588	0.03855	0.06984	0.05160	0.03736	0.04233	0.02072	0.02872	0.02569	0.00471
Apples	23.2		0.06221	0.19547	0.34496	0.21887	0.17449	0.09517	0.08287	0.07746	0.05079	0.02482
Pears	23.2		0.03248	0.05920	0.15152	0.08431	0.05121	0.04282	0.03367	0.04362	0.05279	0.02772
Apricots	1.5		0.00055	0.00202	0.00154	0.00094	0.00063	0.00056	0.00033	0.00114	0.00065	0.00056
Peaches	12.51		0.01707	0.01682	0.03926	0.01971	0.01470	0.00956	0.00561	0.01172	0.01168	0.00542
Plums	1.5		0.00137	0.00072	0.00323	0.00203	0.00118	0.00043	0.00037	0.00105	0.00098	0.00031
Cherries	1.5		0.00071	0.00214	0.00157	0.00226	0.00083	0.00107	0.00088	0.00078	0.00053	0.00012
Table grapes	25		0.03289	0.04138	0.11741	0.05390	0.06464	0.02760	0.01575	0.05097	0.03319	0.01153
Wine grapes	25		0.24611	0.03045	0.02220	0.02266	0.00791	0.02521	0.08827	0.24297	0.16617	0.03645
Strawberries	75		0.04431	0.14397	0.14948	0.10098	0.06723	0.05141	0.03797	0.07264	0.07691	0.03835
Blackberries	58.2		0.00659	L/C	0.11319	0.00369	0.01921	0.01467	0.00556	0.01815	0.01537	0.00246
Loganberries	1.5		0.00012	0.00090	0.00170	0.00025	0.00076	0.00038	0.00024	0.00033	0.00024	0.00015
Raspberries	58.2		0.02412	L/C	0.13848	0.03804	0.05858	0.01528	0.00401	0.02330	0.04858	0.02183
Gooseberries	18.4		0.00455	0.00952	0.01206	0.00449	0.00435	0.00433	0.00340	0.01332	0.01518	0.00436
Blackcurrants	18.4		0.01056	0.02178	0.03299	0.03303	0.02543	0.01886	0.02062	0.00654	0.00990	0.00514
Red currants	18.4		0.00136	L/C	0.01447	L/C	0.00107	0.00219	0.00081	0.00072	0.00621	L/C
White currants	18.4		L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Avocados	37.5		0.02926	L/C	0.04733	L/C	L/C	L/C	0.01199	0.02558	0.01960	L/C
Bananas	1.5		0.00309	0.01045	0.00996	0.00671	0.00519	0.00309	0.00218	0.00321	0.00247	0.00274

Dates	1.5		0.00032	L/C	0.00055	0.00069	0.00021	0.00004	L/C	0.00071	0.00102	0.00037
Figs	1.5		0.00044	0.00057	0.00061	0.00018	0.00026	0.00006	0.00009	0.00099	0.00030	0.00010
Kiwi fruit	34.5		0.02420	L/C	0.07971	0.06934	0.04064	0.03213	0.07976	0.04210	0.01866	0.00510
Lychees	1.5		0.00052	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Mangoes	38.5		0.02644	L/C	0.06213	0.05409	0.06753	0.02214	0.14042	0.02072	0.00642	L/C
Olives	1.5		0.00038	L/C	0.00091	0.00090	L/C	0.00008	L/C	0.00030	0.00065	L/C
Passion fruit	1.5		0.00021	L/C	L/C	L/C	L/C	L/C	L/C	0.00034	L/C	L/C
Pineapples	37.5		0.04327	0.19397	0.17716	0.25372	0.09138	0.05438	0.03932	0.04323	0.02881	0.02301
Pomegranates	1.5		0.00180	0.00084	0.00124	0.00062	0.00075	0.00085	0.00004	0.00080	0.00093	0.00149
Beetroot	1.5		0.00056	L/C	0.00224	0.00060	0.00049	0.00051	0.00036	0.00072	0.00075	0.00027
Carrots	1.5		0.00105	0.00528	0.00370	0.00285	0.00184	0.00127	0.00147	0.00133	0.00145	0.00116
Celeriac	6		0.00223	L/C	L/C	0.00029	0.00037	L/C	L/C	L/C	L/C	L/C
Horseradish	1.5		0.00002	L/C	L/C	L/C	L/C	L/C	L/C	L/C	0.00003	L/C
Jerusalem artichokes	1.5		0.00025	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Parsnips	1.5		0.00048	0.00138	0.00177	0.00108	0.00074	0.00060	0.00039	0.00063	0.00092	0.00043
Radishes	18.75		0.00582	L/C	0.01836	L/C	0.00413	0.00215	0.00191	0.00565	0.00458	0.00180
Salsify	1.5		L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Swedes	1.5		0.00073	0.00419	0.00257	0.00102	0.00117	0.00091	0.00069	0.00074	0.00099	0.00073
Turnips	1.5		0.00052	L/C	0.00148	0.00131	0.00085	0.00084	0.00050	0.00023	0.00093	0.00061
Yam	1.5		0.00438	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Garlic	4.4		0.00028	L/C	0.00027	0.00045	0.00063	0.00031	0.00054	0.00059	0.00064	L/C
Onions	37.5		0.01974	0.04224	0.04190	0.03476	0.02949	0.02742	0.01893	0.02710	0.01997	0.01144
Spring onions	22.5		0.00563	L/C	0.00357	0.01471	0.00408	0.00202	0.00240	0.00563	0.00572	0.00201
Tomatoes	75		0.10332	0.13707	0.19759	0.14415	0.13811	0.08094	0.10004	0.13268	0.10911	0.10045
Peppers	97.5		0.03605	L/C	0.07867	0.03995	0.06595	0.03108	0.02797	0.05906	0.05522	0.01836
Aubergines	75		0.02368	L/C	0.11483	0.05671	0.02015	0.03938	0.02880	0.04644	0.03040	L/C

Marrows	56.25		0.02820	L/C	0.08767	0.02195	0.03404	0.03586	0.01446	0.02952	0.07707	0.03643
Cucumbers	14		0.00569	0.00306	0.03389	0.02158	0.01459	0.00726	0.00645	0.00764	0.00664	0.00250
Gourd	56.25		0.03035	L/C	L/C	L/C	L/C	0.01500	L/C	0.01147	L/C	L/C
Courgettes	25.5		0.01070	0.03781	0.06050	0.03271	0.01997	0.01068	0.00971	0.01418	0.01315	0.01143
Melons	14		0.03459	0.04264	0.07338	0.04938	0.04268	0.03019	0.03864	0.03554	0.04184	0.01384
Sweet corn	3.75		0.00194	0.00379	0.00851	0.00404	0.00443	0.00187	0.00232	0.00213	0.00313	0.00130
Broccoli	7.5		0.00485	0.00862	0.01283	0.00915	0.00784	0.00539	0.00471	0.00513	0.00717	0.00259
Cauliflower	7.5		0.00653	0.02362	0.01629	0.01255	0.00641	0.00556	0.00641	0.00914	0.00851	0.00499
Brussels sprouts	7.5		0.00454	0.01750	0.01345	0.01094	0.00553	0.00694	0.00474	0.00596	0.00720	0.00347
Head cabbage	7.5		0.00409	0.01319	0.01278	0.00948	0.00561	0.00538	0.00397	0.00568	0.00869	0.00552
Chinese cabbage	7.5		0.00373	L/C	L/C	L/C	L/C	L/C	L/C	0.00376	0.00262	L/C
Kohl Rabi	7.5		L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Cress	57.4		0.00219	L/C	0.00277	0.00392	0.00130	0.00239	0.00171	0.00439	0.00551	0.00233
Lettuce	57.4		0.03557	0.02045	0.04909	0.03948	0.04161	0.02320	0.02537	0.04045	0.03073	0.01575
Spinach	57.4		0.03014	0.05740	0.08986	0.04928	0.05034	0.03588	0.01997	0.03916	0.03219	0.02022
Watercress	57.4		0.00876	L/C	L/C	0.00364	0.00390	0.01016	L/C	0.01325	0.01727	L/C
Chicory	57.4		0.00431	L/C	L/C	L/C	L/C	L/C	L/C	0.00413	L/C	L/C
Parsley	57.4		0.00974	L/C	0.00633	L/C	0.00910	0.00239	0.00081	0.00981	0.01030	0.02106
Beans with pods	1.5		0.00079	0.00181	0.00289	0.00198	0.00100	0.00053	0.00106	0.00060	0.00109	0.00047
Runner Beans	1.5		0.00094	L/C	0.00222	0.00074	0.00111	0.00086	0.00075	0.00227	0.00147	0.00084
Beans without pods	24.3		0.01068	0.01424	0.05832	0.00925	0.02564	0.00916	0.01025	0.01534	0.01953	0.01282
Peas with pods	1.5		0.00043	L/C	0.00070	0.00190	0.00034	0.00043	0.00025	0.00038	0.00077	L/C
Peas without pods	1.5		0.00116	0.00360	0.00305	0.00209	0.00154	0.00110	0.00138	0.00131	0.00150	0.00109
Beansprouts	1.5		0.00059	L/C	0.00134	0.00085	0.00085	0.00054	0.00040	0.00058	0.00086	0.00035

Asparagus	3.82		0.00155	L/C	L/C	L/C	L/C	L/C	0.00083	0.00303	0.00168	L/C
Bamboo shoots	1.5		0.00024	L/C	0.00042	L/C	0.00008	0.00038	0.00008	0.00027	0.00014	L/C
Celery	1.5		0.00049	0.00064	0.00063	0.00043	0.00024	0.00038	0.00027	0.00069	0.00073	0.00017
Fennel	0.32		0.00012	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Globe artichokes	37.5		0.01174	L/C	L/C	L/C	L/C	L/C	L/C	0.00748	L/C	L/C
Leeks	22.5		0.01110	L/C	0.01443	0.00823	0.00684	0.00802	0.00511	0.01093	0.01300	0.00811
Rhubarb	1.5		0.00060	0.00109	0.00166	0.00036	0.00075	0.00021	0.00024	0.00052	0.00101	0.00061
Cultivated mushrooms	1.5		0.00060	0.00074	0.00158	0.00075	0.00060	0.00046	0.00064	0.00098	0.00063	0.00045
Beans	1.5		0.00234	0.00886	0.00708	0.00503	0.00428	0.00314	0.00319	0.00263	0.00211	0.00146
Lentils	1.5		0.00108	0.00217	0.00277	0.00295	0.00097	0.00186	0.00075	0.00105	0.00075	0.00036
dried Peas	1.5		0.00102	L/C	0.00262	0.00070	0.00110	0.00179	0.00096	0.00086	0.00160	0.00108
Oilseeds	1.5		0.00477	0.00946	0.01087	0.01073	0.00839	0.00605	0.00529	0.00702	0.00481	0.00579
Potatoes	26.9		0.08743	0.29961	0.24748	0.22229	0.18891	0.14358	0.12244	0.09514	0.08822	0.08563
Oats	1.5		0.00053	0.00329	0.00182	0.00115	0.00068	0.00053	0.00096	0.00096	0.00079	0.00085
Barley	1.5		0.00037	L/C	0.00050	0.00052	0.00120	0.00029	0.00034	0.00039	0.00039	0.00022
Millet	1.5		L/C	L/C	0.00043	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Buckwheat	1.5		L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C	L/C
Maize	1.5		0.00010	0.00688	0.00109	0.00074	0.00028	0.00025	0.00026	0.00049	0.00022	0.00012
Wheat	23.13		0.08345	0.06487	0.19653	0.20557	0.15585	0.11541	0.09346	0.09852	0.07556	0.08005
Rice	1.5		0.00339	0.00421	0.00711	0.00557	0.00761	0.00589	0.00399	0.00301	0.00179	0.00073
Rye	1.5		0.00077	0.00205	0.00057	0.00067	0.00071	0.00038	0.00017	0.00090	0.00067	0.00023
Poultry	0.5		0.00081	0.00087	0.00151	0.00138	0.00090	0.00078	0.00076	0.00086	0.00081	0.00039
Meat fat	0.5		0.00009	0.00021	0.00036	0.00021	0.00015	0.00013	0.00012	0.00006	0.00010	0.00008
Meat excl. poultry & offal	0.5		0.00095	0.00203	0.00207	0.00172	0.00153	0.00103	0.00105	0.00019	0.00089	0.00084

All types of kidney	2.23		0.00065	0.00095	0.00301	0.00078	0.00053	0.00046	0.00067	L/C	0.00106	0.00071
All types of Liver	0.5		0.00024	0.00112	0.00119	0.00017	0.00022	0.00030	0.00015	L/C	0.00034	0.00024
Other types of offal	2.23		0.00154	0.00351	0.00486	0.00244	0.00209	0.00228	0.00103	0.00034	0.00170	0.00160
Eggs	0.5		0.00049	0.00237	0.00172	0.00116	0.00079	0.00072	0.00048	0.00054	0.00050	0.00070
Milk	0.13		0.00107	0.01268	0.00725	0.00383	0.00236	0.00153	0.00121	0.00126	0.00112	0.00153
Sugar beet	1.5		0.02091	0.05002	0.08360	0.05050	0.04716	0.03004	0.02890	0.01790	0.01592	0.02276

* 0.00000 corresponds to <0.000005 mg/kg bw/day (any value ≥0.000005 is rounded to 0.00001

L/C Low consumption (<0.1 g/day) or low number of consumers (<4)

Table B.2 Chronic risk assessment undertaken using PRIMo revision 3.1

Chronic risk assessment: JMPR methodology (IEDI/TMDI)											
				No of diets exceeding the ADI :		---				Exposure resulting from	
	Calculated exposure (% of ADI)	MS Diet	Expsoure (µg/kg bw per day)	Highest contributor to MS diet (in % of ADI)	Commodity / group of commodities	2nd contributor to MS diet (in % of ADI)	Commodity / group of commodities	3rd contributor to MS diet (in % of ADI)	Commodity / group of commodities	MRLs set at the LOQ (in % of ADI)	commodities not under assessment (in % of ADI)
TMDI/NEDI/IEDI	43.5%	DE child	979.33	10.1%	Oranges	9.6%	Apples	4.3%	Wheat		
	41.7%	NL toddler	938.43	8.3%	Apples	5.6%	Oranges	5.1%	Potatoes		
	38.5%	GEMS/Food G06	865.52	11.9%	Tomatoes	7.4%	Wheat	2.5%	Oranges		
	28.5%	NL child	640.37	4.4%	Apples	4.2%	Wheat	4.1%	Potatoes		
	26.3%	RO general	592.03	6.4%	Tomatoes	5.2%	Wheat	4.5%	Potatoes		
	26.2%	GEMS/Food G11	589.82	4.7%	Potatoes	3.7%	Wheat	3.0%	Tomatoes		

	25.0%	FR child 3 15 yr	562.97	8.5%	Oranges	4.7%	Wheat	2.8%	Tomatoes			
	24.9%	GEMS/Food G07	560.77	4.5%	Potatoes	4.3%	Wheat	3.6%	Tomatoes			
	24.8%	GEMS/Food G15	558.70	4.7%	Wheat	4.3%	Potatoes	4.0%	Tomatoes			
	24.8%	GEMS/Food G10	557.21	4.5%	Tomatoes	4.0%	Wheat	3.5%	Potatoes			
	24.4%	GEMS/Food G08	547.90	4.7%	Potatoes	4.2%	Wheat	3.8%	Tomatoes			
	22.6%	IE adult	508.80	2.7%	Potatoes	2.6%	Oranges	2.4%	Wheat			
	22.0%	PT general	495.56	6.4%	Potatoes	4.0%	Wheat	3.0%	Tomatoes			
	21.4%	SE general	481.14	5.0%	Potatoes	3.3%	Wheat	2.5%	Tomatoes			
	20.4%	ES child	458.18	5.4%	Oranges	4.6%	Wheat	3.3%	Tomatoes			
	19.9%	DE women 14-50 yr	447.88	4.8%	Oranges	2.5%	Tomatoes	2.2%	Wheat			
	19.9%	UK toddler	447.46	4.9%	Oranges	4.2%	Potatoes	4.0%	Wheat			
	19.8%	DK child	445.54	4.5%	Wheat	4.3%	Cucumbers	2.9%	Potatoes			
	19.3%	FR toddler 2 3 yr	434.71	3.6%	Oranges	3.2%	Wheat	2.4%	Apples			
	18.8%	IT toddler	422.42	6.8%	Wheat	4.7%	Tomatoes	1.2%	Oranges			
	18.1%	DE general	407.87	3.9%	Oranges	2.2%	Tomatoes	1.9%	Wheat			
	16.3%	FI 3 yr	367.78	5.6%	Potatoes	2.7%	Cucumbers	1.9%	Tomatoes			
	15.6%	NL general	350.00	2.9%	Potatoes	2.5%	Oranges	2.0%	Wheat			
	14.9%	IT adult	334.56	4.3%	Wheat	3.9%	Tomatoes	0.9%	Oranges			
	14.6%	ES adult	328.60	3.2%	Oranges	2.6%	Tomatoes	2.4%	Wheat			
	14.4%	UK infant	324.49	3.9%	Potatoes	3.2%	Oranges	2.7%	Wheat			
	13.2%	FI 6 yr	297.92	4.6%	Potatoes	1.9%	Cucumbers	1.4%	Tomatoes			
	12.5%	FR adult	282.24	2.6%	Wine grapes	2.3%	Wheat	1.5%	Tomatoes			
	12.5%	UK vegetarian	282.07	2.2%	Oranges	2.1%	Wheat	2.1%	Tomatoes			
	11.3%	PL general	253.93	4.1%	Potatoes	2.9%	Tomatoes	1.6%	Apples			
	10.6%	LT adult	238.01	3.8%	Potatoes	2.1%	Tomatoes	1.4%	Apples			
	10.2%	FI adult	230.54	2.1%	Coffee beans	1.8%	Tomatoes	1.4%	Potatoes			
	10.1%	UK adult	227.18	1.7%	Wheat	1.7%	Potatoes	1.4%	Tomatoes			
	9.6%	FR infant	215.30	2.3%	Potatoes	1.5%	Courgettes	1.3%	Apples			

	9.5%	DK adult	213.53	1.7%	Tomatoes	1.5%	Potatoes	1.2%	Wheat		
	3.2%	IE child	71.17	1.2%	Wheat	0.7%	Potatoes	0.3%	Apples		
	Conclusion: The estimated long-term dietary intake (TMDI/NEDI/IEDI) was below the ADI. The long-term intake of residues of Potassium phosphonates (phosphonic acid) is unlikely to present a public health concern.										

Appendix C - Detailed evaluation of the additional studies relied on

C.1 Methods of analysis

C.1.1 Methods for enforcement and monitoring of residues in food and feed of plant origin

No additional studies submitted.

C.1.2 Methods for enforcement and monitoring of residues in food and feed of animal origin

No additional studies submitted.

C.1.3 Methods for risk assessment for residues in food and feed of plant origin

Reference:	Determination of residues of phosphoric acid in asparagus raw agricultural commodity after four applications of AsS1017 in Germany and Northern Europe – 2020/2021 [redacted] 2023, Study code S21-08060
GLP:	Yes
Acceptability of the method:	Acceptable

Principle of the method

Study objective

The objective was to analyse samples of matrix asparagus for residues of phosphonic acid

Sample preparation

Samples of asparagus were stored in frozen conditions before use and homogenised with a cutting mill with dry ice.

To samples of homogenised asparagus (10g) was added 0.7g water. To this was added 10.0 ml of methanol containing 1% formic acid. The extract volume was 20 ml (10 ml methanol/formic acid, 0.7g water and the rest of the water (9.3g) was from the asparagus (93% water). The sample was then shaken vigorously on a horizontal shaker for 15 minutes and then centrifuged for 5 min at 4000 rpm. A 100 µl aliquat was then made up to 1 ml with 1:1 v/v water/1% formic acid in methanol. Additional dilution if necessary was carried out at this point if required. The resulting sample concentration is 0.05 g/mL.

Extraction efficiency was not investigated during the method validation. This method uses predominantly methanol: water (50:50 v/v) as the extraction solvent which is similar to the solvent used in the metabolism studies to extract phosphonic acid (Fosetyl DAR). In principle further data are required. However, the lack of data are unlikely to impact the MRL calculated or the outcome of the consumer risk assessment. Therefore, no further data are required at this time.

Residues of phosphonic acid are determined by LC-MS/MS against solvent standards using the following conditions:

HPLC-MS/MS System	Agilent 1290 HPLC System (Vacuum Solvent Degasser, Binary HPLC Pump, Multicolumn Thermostat)
Pre-column	Phenomenex C18 guard column: Length: 4 mm, i.d: 3mm
Column	Thermo Hypercarb: length: 100 mm, i.d: 4.6 mm, particle size: 5.0 µm
Column temperature	60 °C
Injection volume	20 µL
Mobile phase	Eluent A: Water containing 0.5% formic acid (v/v) and 5 µm Ammoniumacetate Eluent B: Methanol containing 0.5% formic acid (v/v) and 5 µm Ammoniumacetate
Flow rate	600 µL/min
Ions monitored	m/z 81→79 (primary quantitation ion) m/z 81→63 (confirmatory ion)

Results and discussion

Mean recoveries for the quantification ion transition (both corrected and uncorrected) were within the acceptable range of 70 - 120 % with an RSD ≤ 15 % for matrices at 0.1 and 1 mg/kg and were within the acceptable range of 70 - 110 % with an RSD ≤ 10 % for matrices at 10 mg/kg.

For confirmation at LOQ, the corrected values (*in italics*) were outside of the acceptable levels however the uncorrected values were acceptable. As the accuracy of the quantification transitions are within the acceptable range the accuracy is considered acceptable.

Table C.1.1.1-1 Recovery Results in asparagus
Standards prepared in solvent.

Matrix	Ion transition	level (mg/kg)	No samples per level	Range of recoveries (%) [*Corrected*]	Mean recovery	RSD (%)	Comments
Asparagus	81 → 79	0.1	5	88-93	88	4.5	
	Quantification	1	5	100-103	101	0.9	
		10	5	82-83 [*91-93*]#	83 92#	0.9 0.8#	
	81 → 63	0.1	5	84-97 [*149-163*]#	92 157#	5.3 3.1#	
	Confirmation	1	5	97-99 [*109-111*]#	98 110#	0.9 0.8#	
		10	5	83-85 [*93-96*]#	84 94#	1.1 0.9#	

corrected results based on residues in control samples

Table C.1.1.1-2 Characteristics of the analytical method for the quantitation of phosphonic acid residues in asparagus

Phosphonic acid in asparagus	
Chromatographic method	LC-MS/MS
Specificity demonstrated (yes/no, by…)	Yes by two mass transitions – highly specific therefore no confirmatory technique required.

Phosphonic acid in asparagus	
Linearity demonstrated (yes/no)	Yes. r = >0.999
Accepted calibration range in concentration units (e.g. in µg/ml or ng/µl)	1 –100 ng/mL (0.02 –2 mg/kg)
Calibration consist of at least 3 levels (duplicated points) or 5 levels (single points)? (yes/no)	7 single points
Matrix effects	No. Matrix effects of <20% demonstrated
Absence of interference >30% of LOQ in blank sample is demonstrated (yes/no)	No, reagent blanks demonstrated interference of >30%. Believed to be due to background levels of phosphonates due to fertiliser use
Chromatogram of sample spiked at LOQ demonstrates sufficient S/N ration? (yes/no)	Yes
LOQ (mg/kg)	0.1. This is acceptable as the current default LOQ MRL for fosetyl is 2* mg/kg and this is equivalent to 1.5* mg/kg expressed as phosphonic acid

Conclusion

The method is not satisfactorily validated in accordance with SANTE/2020/12830 rev. 1, due to issues with absence of interference in the control issues and extraction efficiency. Whilst the level of interference is > 30 %, this is acceptable as the levels of phosphonic acid found are likely due to the use of phosphonate fertilisers. Phosphonic acid residues arising from fertilisers is a known issue. The overall validation data is sufficient to demonstrate that the method is suitable to determine residues of phosphonic acid in asparagus.

C.1.4 Methods for risk assessment for residues in food and feed of animal origin

No additional studies submitted.

C.1.5 Methods for risk assessment for toxicological studies

No additional studies submitted.

C.2 Mammalian toxicology

No additional studies submitted.

C.3 Residue data

C.3.1 Nature and magnitude of residues in primary crops

C.3.1.1 Nature of residues

No additional studies submitted.

C.3.1.2 Magnitude of residues

C.3.1.2.1 Asparagus

Reference:	Magnitude of the residue of a formulation containing potassium phosphonate in asparagus raw agricultural commodity after four applications of Frutogard in Northern Europe – 2020, [redacted]., 2023, Study number: ACE20-116
Guideline(s):	Regulation (EC) No 1107/2009 of October 2009
	OECD (2009), Test No. 509: Crop field trial, OECD Guidelines for the Testing of Chemicals, Section 5, OECD publishing
	Regulation (EU) No 283/2013 of 1 March 2013 setting out the data requirements for active substances
	Guidance for generating and reporting methods of analysis in support of pre-registration data requirements for Annex II and Annex III of Directive 91/414 – SANCO/3029/99 rev. 4, 11 July 2000
	Guidance Document on Pesticide Residue Analytical methods ENV/JM/MONO(2007)17
	Technical Guidline on the evaluation of Extraction Efficiency of Residue Analytical Methods – SANTE 2017/10632 Rev. 3, 22 November 2017
	The Application of GLP Principles to Field Studies, OECD Series on Principles of GLP Compliance Monitoring Number 6 (Revised 1999), ENV/JM/MONO(99)22
	The Application of the OECD Principles of GLP to the Organisation and Management of Multi-Site Studies, OECD Series on Principles of GLP Compliance Monitoring Number 13, ENV/JM/MONO(2002)9
Deviations:	Minor deviations that are not expected to affect the validity of the trial

	One major deviation for a single trial with fertiliser applied that could affect the residue analyses for the components of the relevant residue definition.
GLP:	Yes
Validity of the study:	Acceptable

Materials and methods

Three trials on asparagus were conducted in UK and Germany (NEU, reflecting the agronomic and climatic conditions in the UK) using 'Frutogard (AKA AaS1017)', an SC formulation containing 342 g/L potassium phosphonates (228 g/L phosphonic acid equivalents), in the 2020 growing season.

'Frutogard' was applied as a foliar spray at a rate of 1368 g/ha potassium phosphonates (912 g/ha as phosphonic acid equivalents) in 400 L/ha of water. 4 applications were made at BBCH 69 to BBCH 99 (PHI 214 days) - ACE20-116 UK01, BBCH 59-75 (249 days PHI) – ACE20-116 UK02 and BBCH 87-95 (PHI 219 days) – ACE20-116 GE03. The applications were made after the asparagus spears were harvested up to when the crops moved towards senescence in the autumn. Residues were then determined in the asparagus spears harvested in the following growing season. The interval between applications was 14 days. The applications were within 25% of the proposed critical GAP (4 x 912 g/ha (as phosphonic acid) in all regards except RTI (proposed as 7 days but 14 days in the trials). However, this deviation in the trial parameter compared to the GAP is unlikely to impact the residue levels given the long PHI (200+ days) and given the application is after the consumable part of the crop has been harvested as the crop moves towards senescence. Overall, it can be concluded that the trials reflect the proposed GAP

Weather data were reported for the trials and no exceptional events were noted. The trials were at harvest trials of asparagus spears, harvested after the treatments in the previous growing season, 214-249 days after last application. Samples containing at least 2 kg were collected from both treated and control plots in all trials (with exceptions noted for retain samples). Samples were frozen within ~3 hours, and stored at ≤-18 °C until analysis. The maximum storage interval between harvest and analysis was 20 months Data was considered in the EFSA Fosetyl Article 12 RO (2012) which demonstrates stability of phosphonic acid for this period of time in high water crops when stored at ≤-18 °C.

Analysis was performed using LC-MS/MS method described in report S21-08060. Full details and validation data for this method can be found in section C.1.3.

The analytical method was considered suitable for the determination of phosphonic acid residues in asparagus. The LOQ of the method is 0.1 mg/kg. Acceptable procedural recovery data for phosphonic acid, using an appropriate number of samples were presented.

A number of deviations were noted, most of these did not affect the validity of the trial. Examples were limited to retained samples (sample timings and amounts) and minor exceedances of storage temperature for the test item.

Residues were detected in control samples for one of the trials (ACE20-116 UK2) at a level of 8.38 mg/kg and it was noted that the site chosen had added 2 x 1200 g/ha of mono and di potassium phosphonates as a fertiliser in the 2020 season, ~6 months prior to the application of the product. This additional fertiliser was also added in the 2018 and 2019 seasons. This trial is therefore not considered to support the GAP. All other control samples gave resides <LOQ.

Results and discussions

Acceptable procedural recovery data for phosphonic acid, using an appropriate number of samples were presented.

In all untreated specimens (except the trial noted previously) no residues of phosphonic acid above the LOQ were present.

Residues of phosphonic acid in asparagus spears at 214-219 days after last application were between 1.41 – 9.24 mg/kg.

Table C.3.1.2.1-1 Residue trials on Asparagus

Reference:	Magnitude of the residue of a formulation containing potassium phosphonate in asparagus raw agricultural commodity after four applications of Frutogard in Northern Europe – 2020, [redacted] 2023, Study number: ACE20-116		
GLP:	Yes	Sample storage conditions:	-18°C, 20 months
Crop/crop group:	Asparagus	Analytical method:	Referenced in S21-08060. Validated
Indoor/outdoor:	Outdoor	Limit of Quantification (mg/kg):	0.1
Formulation:	SC	Residues calculated as:	Phosphonic acid
Content of active substance:	342 g/L potassium phosphonates (228 g/L phosphonic acid equivalent)		

Trial No Location Year	**Commodity Variety**	**Date of 1.Sowing or planting 2.Flowering 3.Harvest**	**Application Rate (as Treatment acid**		**per phosphonic equivalents)**	**Dates of treatment or number and last date**	**Interval between applications (days)**	**Growth stage at last treatment**	**Portion analysed**	**Residues (mg/kg)**	**PHI (days)**	**Remarks**
			g a.s./ ha	Water (L/ha)	g a.s./ hL					Phosphonic acid		
ACE20-116 UK01/Halstead, Essex, UK/ NEU, 2020	Asparagus, Guelph Eclips	1. Mar 2017 perennial crop 2. Sept-Oct 2020 3. 1 Jun 2021	228	400	57	4, last treatment 28/10/2020	14	BBCH 99	Asparagus spear	9.24	214	

Trial No Location Year	**Commodity Variety**	**Date of 1.Sowing or planting 2.Flowering 3.Harvest**	**Application Treatment acid**	**Rate (as**	**per phosphonic equivalents)**	**Dates of treatment or number and last date**	**Interval between applications (days)**	**Growth stage at last treatment**	**Portion analysed**	**Residues (mg/kg)**	**PHI (days)**	**Remarks**
			g a.s./ ha	Water (L/ha)	g a.s./ hL					Phosphonic acid		
ACE20-116 UK02/Thetford, Norfolk UK/ NEU, 2020	Asparagus, Millennium	1. Feb 2018 per-ennial crop 2. Sept-Oct 2020 3. 5 Jul 2021	228	400	57	4, last treatment 29/10/2020	14	BBCH 75	Asparagus spear	11.5	249	Untreated specimen had residues of 8.38 mg/kg. Was treated with 2 applications of a phosphonate fertiliser. Trial not used to calculate MRL or for consumer risk assessment.
ACE20-116 GE 03/Oberhavel, Brandenburg, Ger-many/ NEU, 2020	Asparagus, Gralim	1. Feb 2014 per-ennial crop 2. Jul-Aug 2020 3. 26 May 2021	228	400	57	4, last treatment 19/10/2020	14	BBCH 95	Asparagus spear	1.41	219	

C.3.1.2.2 Asparagus

Reference:	Residue study (harvest) in white asparagus following four applications with AaS1017 in Germany 2020/2021 -field part, [redacted] 2021, Study No. CT20-1-108
Guideline(s):	OECD Guidelines for the testing of chemicals, No 509: Crop Field Trials (2009) EEC document 7029/V1/95 rev. 5, 1997, Appendix B working document 1607/V1/97, rev. 2, 1999: General recommendation for the design, preparation and realisation of residue trials The Principles of Good Laboratory Practice, ChemG 25.07.1994, §19, Annex 1 (BGBL 21, I, 2001, p. 843-855) OECD-Principles of Good Laboratory Practice, No. 4: Quality Assurance and GLP (as revised in 1999), ENV/JM/MONO (1999)20, Paris 2002 The Application of the GLP Principles to Field Studies, OECD Consensus Document, 6, revised, ENV/JM/MONO (1999) 22, Paris 2002 The Application of the OECD Principles of GLP to the Organisation and Management of Multi-site Studies, OECD Consensus Document, 13, ENV/JM/MONO (2002) 9 Rückstandsversuche, Teil 1 Prüfungen an Pflanzen, A: Allgemeiner Teil, B: Spezieller Teil, IVA-Guideline, Industrieverband Agrar e. V.1992
Deviations:	Minor deviations that are not expected to affect the validity of the trial
GLP:	Yes
Validity of the study:	Acceptable

Materials and methods

Two trials on asparagus were conducted in Germany (NEU and reflecting the agronomic and climatic conditions in the UK) using ‘Frutogard (AKA AaS1017’, an SC formulation containing 342 g/L potassium phosphonates (228 g/L phosphonic acid equivalents), in the

2020 growing season.

'Frutogard' was applied as a foliar spray at a rate of 1368 g/ha potassium phosphonates (912 g/ha as phosphonic acid equivalents) in 600-800 L/ha of water. 4 applications were made at BBCH 39 - 91 (PHI 212 - 229 days), The applications were made after the asparagus spears were harvested up to when the crops moved towards senescence in the autumn. Residues were then determined in the asparagus spears harvested in the following growing season. The interval between applications was 14 days in all cases with the exception of the final application in trial CT20-1-108DE1 which was carried out 19 days after application three due to rainy and windy weather. The applications were within 25% of the proposed critical GAP (4 x 912 g/ha (as phosphonic acid) in all regards except RTI (proposed as 7 days but 14 days in the trials). However, this deviation in the trial parameter compared to the GAP is unlikely to impact the residue levels given the long PHI (200+ days) and given the application is after the consumable part of the crop has been harvested as the crop moves towards senescence. Overall, it can be concluded that the trials reflect the proposed GAP

Weather data were reported for the trials and no exceptional events were noted. The trials were at harvest trials of asparagus spears, harvested after the treatments in the previous growing season, 212 - 229 days after last application. Samples containing at least 1-2 kg were collected from both treated and control plots (due to colder weather, in trial 2, only 1 kg of asparagus spears could be sampled, this was considered acceptable as there were enough samples taken that were distributed amongst the central areas of the plot and there was enough material for analysis). Samples were frozen within 3 hours, and stored at ≤-18 ^{o}C until analysis. The maximum storage interval between harvest and analysis was approximately 9 months Data was considered in the EFSA Fosetyl Article 12 RO (2012) which demonstrates stability of phosphonic acid for this period of time in high water crops when stored at ≤--18 ^{o}C.

Analysis was performed using LC-MS/MS method described in report S21-08060. Full details and validation data for this method can be found in section C.1.3.

The analytical method was considered suitable for the determination of phosphonic acid residues in asparagus. The LOQ of the method is 0.1 mg/kg. Acceptable procedural recovery data for phosphonic acid, using an appropriate number of samples were presented.

Two deviations were noted and these were not considered to affect the validity of the trial (small increase in retreatment interval in a single trial of an additional 5 days and reduced sample size in trial 2, discussed previously).

Results and discussions

Acceptable procedural recovery data for phosphonic acid, using an appropriate number of samples were presented.

Residues were detected in control samples for all trials (at 1.45 mg/kg for trial 1 and <LOQ (0.0912 mg/kg) for trial 2. The applicant notes that leaf fertilisers were used in the early years of the crop (7 years and earlier) and as phosphonic acid is a component of many leaf fertilisers, this may have had an impact on the levels observed in the controls. This is however still below the default LOQ MRL, expressed as phosphoric acid, of 1.5* mg/kg.

Residues of phosphonic acid in asparagus spears at 212 - 229 days after last application were between 3.56 and 4.08 mg/kg.

Table C.3.1.2.2-1 Residue trials on Asparagus

Reference:	Residue study (harvest) in white asparagus following four applications with AaS1017 in Germany 2020/2021 -field part, [redacted] 2021, Study No. CT20-1-108		
GLP:	Yes	Sample storage conditions:	-18°C, 9 months
Crop/crop group:	Asparagus	Analytical method:	Referenced in S21-08060. Validated
Indoor/outdoor:	Outdoor	Limit of Quantification (mg/kg):	0.1
Formulation:	SC	Residues calculated as:	Phosphonic acid
Content of active substance:	342 g/L potassium phosphonates (228 g/L phosphonic acid equivalent)		

Trial No Location Year	**Commodity Variety**	**Date of 1.Sowing or planting 2.Flowering 3.Harvest**	**Application Treatment acid**	**Rate (as**	**per phosphonic equivalents)**	**Dates of treatment or number and last date**	**Interval between applications (days)**	**Growth stage at last treatment**	**Portion analysed**	**Residues (mg/kg)**	**PHI (days)**	**Remarks**
			g a.s./ ha	Water (L/ha)	g a.s./ hL					Phosphonic acid		
CT20-1-1-108DE1/Sandhausen, Germany, 2020	Asparagus, Gijnlim	1. 2009 perennial crop 2. Sept-Oct 2020 3. 11 May 2021	228	800	28.5	4, last treatment 11/10/2020	14	BBCH 39-91	Asparagus spear	<u>3.56</u>	212	Residues in control of 1.45 mg/kg
CT20-1-1108DE2/ Lehrte, Germany, 2020	Asparagus, Mondeo	1. 2016 perennial crop 2. Sept 2020 3. 10 May 2021	228	600	38	4, last treatment 23/9/2020	14	BBCH 39-91	Asparagus spear	<u>4.08</u>	229	Residues in control <LOQ (0.0912 mg/kg)

C.3.2 Nature and magnitude of residues in processed commodities

No additional studies submitted.

C.3.3 Nature and magnitude of residues in rotational crops

No additional studies submitted.

C.3.4 Nature and magnitude of residues in livestock

No additional studies submitted

C.3.5 Residues in honey

No additional studies submitted.

C.3.6 Storage stability

No additional studies submitted.

Appendix D – List of endpoints

The endpoints have not changed as a result of this assessment. The full list of endpoints is outlined in EFSA conclusion, 2012.

Appendix E – Import Tolerances

Not applicable

Appendix F – Compound codes

No new metabolism studies were evaluated during this assessment and hence this section has not been completed.

Appendix G – Abbreviations

ADI	Acceptable daily intake
ADME	Absorption, distribution, metabolism and excretion
Animal model 2017	EFSA model used to calculate the dietary burden of livestock using the OECD feeding tables
ARfD	Acute reference dose
a.s.	Active substance
BBCH	Growth stages of mono- and dicotyledonous plants
bw	Body weight
CF	Conversion factor
cGAP	Critical GAP
CXL	Codex maximum residue limit
DAR	Draft assessment report
DAT	Days after treatment
DT_{90}	Period required for 90% dissipation (define method of estimation)
DT_{50}	Period required for 50% dissipation (define method of estimation)
EFSA	European Food Safety Authority
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GAP	Good Agricultural Practice
GB	Great Britain
GC-MS	Gas chromatography with mass spectrometry

GLP	Good laboratory practice
HPLC-MS/MS (LC-MS/MS)	High-performance liquid chromatography with tandem mass spectrometry
HR	Highest residue
HSE	Health and Safety Executive
IEDI	International estimate of daily intake
IESTI	International estimate of short-term intake
ILV	Independent laboratory validation
ISO	International Organisation for Standardization
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
LC_{50}	Lethal concentration, median
LD_{50}	Lethal dose, median
LOAEL	Lowest observed adverse effect level
LOD	Limit of detection or limit of determination (should be defined)
LoEP	List of endpoints
LOQ	Limit of quantification **NB** the limit of quantification and limit of determination are the same. Assimilated Regulation 396/2005 refers to the limit of determination Assimilated Regulation 1107/2009 refers to the limit of quantification MRLs marked with an asterisk (e.g. 0.01* mg/kg) are MRLs set at the limit of determination/quantification
MRL	Maximum residue level
NEDI	National estimate of dietary intake
NESTI	National estimate of short-term intake

NOAEL	No observed adverse effect level
NRL	National reference laboratory
OECD	Organisation for Economic Co-operation and Development
PBI	Plant-back interval
PES	Post-extraction solids
Pf	Processing factor
PHI	Preharvest interval
PRIMo	(EFSA) Pesticide Residue Intake Model
QuEChERS	Quick, Easy, Cheap, Effective, Rugged, and Safe (analytical method)
RA	Risk assessment
RD	Residue definition
RD-Enf	Residue definition for enforcement (also referred to as RD-Mo i.e. residue definition for monitoring)
RD-RA	Residue definition for risk assessment
RTI	Re-treatment interval
STMR	Supervised trials median residue
TRR	Total radioactive residue
TTC	Threshold of toxicological concern
WG	Water dispersible granule
WHO	World Health Organization

Additional studies relied upon

Author(s)	Year	Title/Testing Facility/Report No/GLP or GEP Status/Published or not
[redacted]	2020	Magnitude of the residue of a formulation containing potassium phosphonate in asparagus raw agricultural commodity after four applications of Frutogard in Northern Europe Study number: ACE20-116. GLP
[redacted]	2021	Residue study (harvest) in white asparagus following four applications with AaS1017 in Germany 2020/2021 -field part, 2021, Study No. CT20-1-108
[redacted]	2023	Determination of Residues of Phosphonic Acid in Asparagus Raw Agricultural Commodity after four Applications of AaS1017 in Germany and Northern Europe – 2020/2021

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