FINAL REGISTRATION REPORT
Part B

Section 2 Analytical Methods
Detailed summary of the risk assessment

Product code: TOTO 75/ TYTAN 75/ HERKULES 75

Active Substance: Thifensulfuron-methyl – 68.2%

Metsulfuron-methyl – 6.8%

All Zones
Zonal Rapporteur Member State: N/A

CORE ASSESSMENT- renewal of authorisation

Applicant: **Innvigo Sp z o.o.**

Date: **January, 2019**

July 2020

October 2022

Version history

When	What
July 2021	ZRMs evaluated submitted dRR.
October 2022	Final Registration Report

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IIIA 5 METHODS OF ANALYSIS

The applicant supplemented the section of analytical methods with references and description of equivalent reports to protected studies.
Thifensulfuron-methyl and metsulfuron-methyl data matching studies have been evaluated by Reporter Member States United Kingdom and Slovenia respectively and later by Poland. As a result of the assessments all reports were accepted and considered as equivalent to protected studies. Therefore, to support the renewal of authorization of TOTO 75/ TYTAN 75/ HERKULES 75 , INNVIGO is allowed to refer to EU approved reports.

NOTE: zRMS comments/corrections are marked in grey

III 5.2.1 Methods for the analysis of the plant protection product: No new studies have been submitted during the renewal of authorisation. Please refer to the core dossier

Regarding analytical methods for the active substances and relevant impurities, no new studies have been submitted during renewal of authorisation. Please refer to the core dossier.

Sufficiently sensitive and selective analytical methods are available for all analytes included in the residue definitions.
Noticed data gaps are:

- none

Commodity/crop	Supported/ Not supported
Cereals	Supported

Metsulfuron - methyl

☐ Reference to the Inclusion Directive: Commission Directive 2000/49/EC of 26 July 2000;

☐ Reference to the Review Report/EFSA Scientific Report: SANCO/7593/VI/97-final 14 August 2000 and SCP/METSU/002-Final 5 April 2000;

Thifensulfuron - methyl

☐ Reference to the Inclusion Directive: Commission Directive 2001/99/EC of 20 November 2001;

☐ Reference to the Review Report/EFSA Scientific Report: SANCO/7577/VI/97-final 12 December 2001;

Metsulfuron - methyl
Thifensulfuron - methyl
Proposed 'representative formulation' during the Annex I of the Directive 91/414/EEG inclusion: WG.

This document reviews the analytical methods for the product TOTO 75 containing metsulfuron-methyl which was included into Annex I of Directive 91/414 by Commission Directive 2000/49/EC of 26 July 2000 and has been renewed by Commission Implementing Regulation (EU) 2016/139 of 2 February 2016.

Active substance thifensulfuron-methyl was included on Annex I of Directive 91/414/EEC on 1 July 2002 under Inclusion Directive 2001/99/EC of 20 November 2001 and has been renewed by Commission Implementing Regulation (EU) 2016/1424 of 25 August 2016.

The SANTE document for Metsulfuron methyl (SANTE/10319/2015 Rev 3) are considered to provide the relevant review information or a reference to where such information can be found.

The SANTE document for thifensulfuron methyl (SANTE/10150/2016 rev. 2) are considered to provide the relevant review information or a reference to where such information can be found.

The Commission Implementing Regulation for metsulfuron-methyl 2016/139 provides specific provisions under Part B which need to be considered by the applicant in the preparation of their renewal of authorisation and by the MS prior to granting a renewal of authorisation.

For the implementation of the uniform principles of Annex VI, the conclusions of the review report on the metsulfuron-methyl and in particular Appendices I and II thereof, as finalised in the COMMISSION STAFF WORKING DOCUMENT (SANTE/10319/2015 Rev 3) on 11 December 2015 shall be taken into account. In this overall assessment:

Member States may pay particular attention to the:

On the basis of the proposed and supported uses (as listed in Appendix II), the following issues have been identified as requiring particular and short term attention from all Member States, in the framework of any authorisations to be granted, varied or withdrawn, as appropriate:
- the protection of consumers,
- the protection of groundwater,
- the protection of non-target terrestrial plants.

The Commission Implementing Regulation for thifensulfuron-methyl 2016/1424 provides specific provisions under Part B which need to be considered by the applicant in the preparation of their renewal of authorisation and by the MS prior to granting a renewal of authorisation.

For the implementation of the uniform principles of Annex VI, the conclusions of the review report on the thifensulfuron-methyl and in particular Appendices I and II thereof, as finalised in the COMMISSION STAFF WORKING DOCUMENT (SANTE/10150/2016 rev. 2) 12 July 2016 shall be taken into account. In this overall assessment:

Member States may pay particular attention to the:

On the basis of the proposed and supported uses (as listed in Appendix II), the following issues have been identified as requiring particular and short term attention from all Member States, in the framework of any authorisations to be granted, varied or withdrawn, as appropriate:
- the protection of groundwater,
- the protection of non-target plants and aquatic organisms.

Conditions of use shall include risk mitigation measures, where appropriate.
These concerns have been addressed within the current submission.

Appendix 1 of this document contains the list of references included in this document for support of the evaluation.

Appendix 2 of this document is the table of intended uses for TOTO 75

Appendix 3 of this document contains any additional information provided by the applicant.

Information on the detailed composition of TOTO 75 can be found in the confidential dossier of this submission (Registration Report - Part C).

IIIA 5.1 Analytical Standards and Samples

IIIA 5.1.1 Samples of the preparation

Samples will be provided upon request.

IIIA 5.1.2 Analytical standards for the pure active substance

Samples will be provided upon request.

IIIA 5.1.3 Samples of the active substance as manufactured

Samples will be provided upon request.

IIIA 5.1.4 Analytical standards for relevant metabolites and all other components included in the residue definition

Samples will be provided upon request.

IIIA 5.1.5 Samples of reference substances for relevant impurities

Samples will be provided upon request.

IIIA 5.2 Methods for the Analysis of the Plant Protection Product

Analytical methods for determination of metsulfuron-methyl and thifensulfuron-methyl impurities and relevance of CIPAC methods in TOTO 75 were not evaluated as part of the EU reviews of metsulfuron-methyl and thifensulfuron-methyl. Therefore all relevant data are provided and are considered adequate.

IIIA 5.2.1 Description of the analytical methods for the determination of the active substance in the plant protection product

Method

The following analytical method for the determination of the active substance in the plant protection product performed on TOTO 75 has not previously been reviewed and is provided in support of the current assessment.

Report:	KIIIA1 5.2.1/01, Oleksa G., 2010
Title:	Development and validation of a method for determination of metsulfuron-methyl and thifensulfuron-methyl in TOTO 75
Document No:	BA – 11/10, Institute of Industrial Organic Chemistry, Analytical Department, 6 Annopol Str., 03-236 Warsaw, Poland
Guidelines:	SANCO 3030 (99) rev.4.
GLP	Yes

Summary

A method for determination of metsulfuron-methyl and thifensulfuron-methyl in TOTO 75 was developed. The method was based on reversed phase HPLC/UV. It was confirmed, that the method was specific. No interference was observed between additives and the active substances metsulfuron-methyl and thifensulfuron-methyl. The validation parameters for linearity, instrument precision, repeatability and accuracy were within the target range and fulfill EU requirements given in EEC Directive 91/414 and SANCO 3030 (99) rev.4.

Protocol

Test substance	TOTO 75 Batch no: TOTO/13.8..2010
Analytical standards **Metsulfuron-methyl** **Thifensulfuron-methyl**	 **Sigma-Aldrich 99.0%, Product 46432, Batch SZE9070X** **IPO 97.17% ±0.1% Series No 3197x**
Method	**High performance liquid chromatography**
Column	Phenomenex, Luna C8 150 mm x 4,6 mm 5 µ
Mobile phase	Acetonitrile : water (34 % : 66 %) *(v/v)* 0,02 % orto-phosphoric acid
Detection	Wavelength: λ = 206 nm

Concentration range	
[Thifen]	0.2824 mg/ml to 0.4236 mg/ml
[Met]	0.02915 mg/ml to 0.05247 mg/ml.

The content of active ingredients determined in TOTO 75 Batch no: TOTO/13.8..2010 was

[**Met**] **66,5 g/kg ± 0,7 g/kg (6,65 %)**

[Thifen]= 715,4 g/kg ± 6,8 g/kg (71,54 %)

Study Comments: IIIA 5.2.1/01	
Agreed endpoint: IIIA 5.2.1/01	

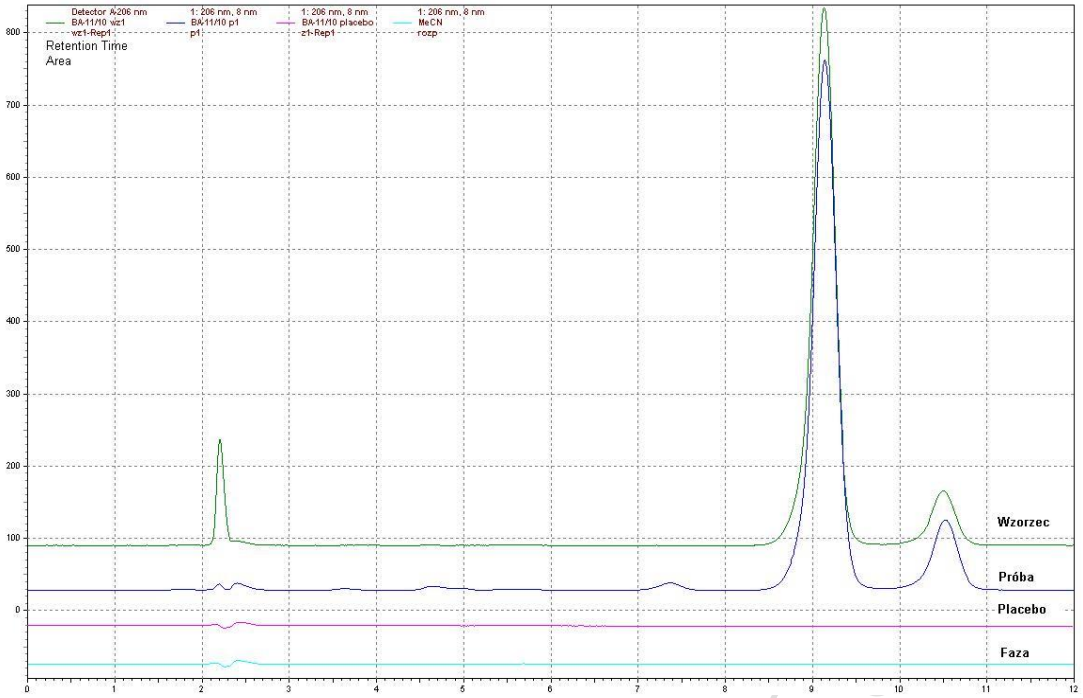
Validation

The following validation of the analytical method for the determination of the active substance in the plant protection product, performed on TOTO 75 Batch no: GAL/16.01.2010, has not previously been reviewed and is provided in support of the current assessment.

Report:	KIIIA1 5.2.1/02, Oleksa G., 2010
Title:	Development and validation of a method for determination of metsulfuron-methyl in TOTO 75
Document No:	BA – 11/10, Institute of Industrial Organic Chemistry, Analytical Department, 6 Annopol Str., 03-236 Warsaw, Poland
Guidelines:	SANCO 3030 (99) rev.4.
GLP	Yes

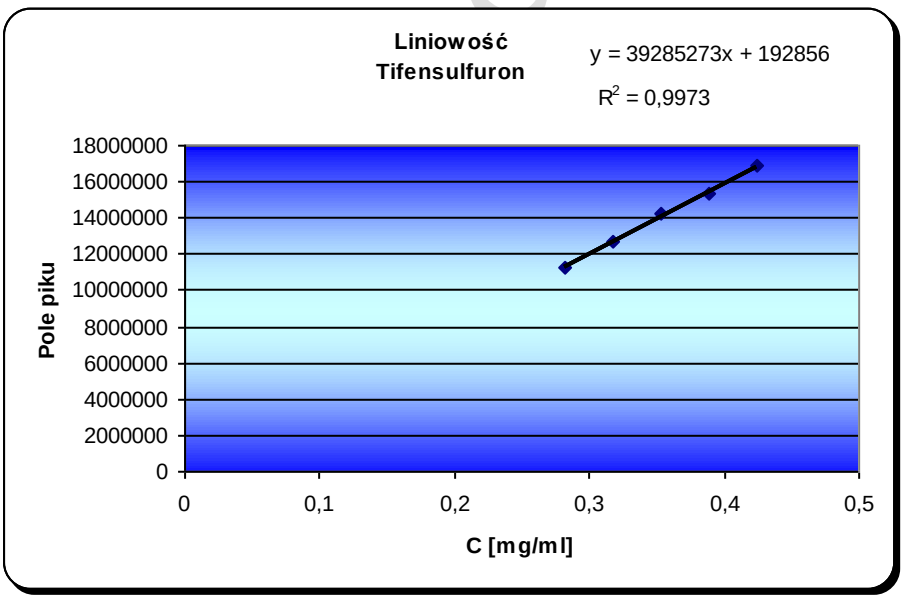
SPECIFICITY

Specificity was demonstrated by superimposing the following chromatograms (from the lowest to the highest): solvent, formulation placebo, TOTO 75, a mixture of analytical standards containing metsulfuron-methyl (0.0252 mg/ml) and thifensulfuron-methyl (0.3625 mg/ml) in proportions corresponding to those in TOTO 75

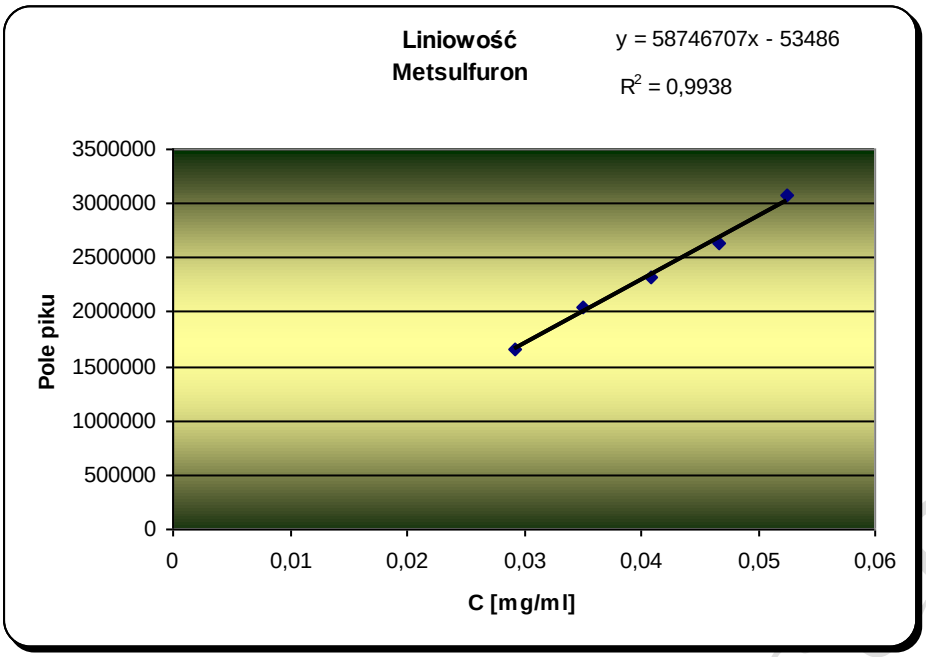


LINIARITY

Liniarity with respect to thifensulfuron-methyl



Linearity with respect to metsulfuron-methyl



Accuracy/Repeatability

The analysis was conducted on 6 samples originating from the same batch of either metsulfuron-methyl or thifensulfuron-methyl analytical standards, the procedure repeated for a different set of 6 samples, and the results compared.

Average recovery

A solution containing a known concentration of either thifensulfuron-methyl or metsulfuron-methyl analytical standards was added to a solution of the formulation placebo and analysed for the content of the corresponding active substance. The average recovery was obtained by comparing the analytical results with the actual quantities present.

SUMMARY

Parameter	Criteria [Thifen]	Results [Thifen]	Criterion [Met]	Results [Met]
Liniarity	$R^2 > 0,99$	$R^2 = 0,997$	$R^2 > 0,99$	$R^2 = 0,994$
Accuracy	RSD < 1,40 %	RSD = 1,21 %	RSD < 2,10 %	RSD = 0,90 %
Repeatability	RSD < 1,40 %	RSD = 1,09 %	RSD < 2,10 %	RSD = 1,33 %
Average recovery	100% ± 2%	97,98 % ÷101,99 %	100% ± 3%	98,49% ÷101,65%

Conclusion:
The analytical method meets the specificity, linearity, precision/repeatability and accuracy criteria specified in SANCO 3030 (99) rev.4.
The analytical method for the determination of metsulfuron-methyl and thifensulfuron-methyl content in TOTO 75 SG may be considered adequate.

Study Comments: IIIA 5.2.1/02	
Agreed endpoint: IIIA 5.2.1/02	

IIIA 5.2.2 For preparations containing more than one active substance, description of method for determining each in the presence of the other

TOTO 75 contains two active substances. The method described in III 5.2.1/01 addresses the determination of one substance in the presence of the other.

IIIA 5.2.3 Applicability of existing CIPAC methods

There is no CIPAC method available for the determination of metsulfuron methyl.
For thifensulfuron-methyl, there is CIPAC Method 452/TC/M/

IIIA 5.2.4 Description of analytical methods for the determination of relevant impurities

~~CONFIDENTIAL information - data provided separately (Part C).~~ There are no relevant impurities.

IIIA 5.2.5 Description of analytical methods for the determination of formulants

Under current EU legislation methods on formulants are not required.

IIIA 5.3 Description of Analytical Methods for the Determination of Residues

IIIA 5.3.1 Description of analytical methods for the determination of residues in crops

EU Conclusions:
Monitoring/Enforcement methods: **metsulfuron-methyl**

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes) B.4.2.1, Study AMR 2519-92, E.Bollin and W.G. George (1992)	HPLC/UV (254 nm) method A 10 g (forage, grain) or 5 g (straw) sample was extracted (three times) with 0.02 M potassium phosphate. The combined supernatants were acidified and then centrifuged. The supernatant was filtered and then passed through a previously conditioned C18 Bond Elut solid phase extraction cartridge, which sorbed the metsulfuron-methyl. Analyte was eluted with 15% acetonitrile / 85% 0.02M potassium phosphate, pH 8. Recovery: 86-100% ± 5% Limit of quantification: 0.05 ppm for wheat/barley grain and forage; 0.1 ppm for wheat/barley straw.

EU Conclusions: EU Residue definition in food of plant/animal origin- metsulfuron methyl

Matrices	**EU Residue definition**		**Reference**
Food of plant origin	Risk assessment	Provisonally Metsulfuron-methyl (parent), pending submission of sufficient metabolism data in cereals and in rotational crops	EFSA Journal 2015;13(1):3936
	Monitoring	metsulfuron methyl	EFSA Journal 2015;13(1):3936
Food of animal origin	Risk assessment	Metsulfuron-methyl (parent), triazine amine; finalisation pending plant residue definition and respective livestock exposure estimates	EFSA Journal 2015;13(1):3936
	Monitoring	metsulfuron methyl	EFSA Journal 2015;13(1):3936

EU Conclusions: Analytical methods for residues of metsulfuron-methyl of crop/animal orgin

Component of residue definition: metsulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Plants, plant products- (Cereals)	Primary	LOQ- 0.01 mg/kg	HPLC-MS/MS	Amoo& Jones (2001), Brookey/ EU agreed, EFSA Journal 2015;13(1):3936/ to which M.Eichler, S. Herman, Stefanie Schabio, 2015, Study code:103141104 and M.Eichler, S. Herman, Stefanie Schabio, 2015, Study code: 103142104 are equivalent
	Confirmatory (if required)	LOQ- 0.01 mg/kg	HPLC-MS/MS	Yozgati, (2012)/ EU agreed, EFSA Journal 2015;13(1):3936/ to which D. Norris, 2016 , Study code: DNA3621 is equivalnt
Animal products, food of animal origin- (Eggs, milk, cream)	Primary	LOQ- 0.01 mg/kg	HPLC-MS/MS	Pentz & Cabusas (2012) / EU agreed, EFSA Journal 2015;13(1):3936/ to which D. Norris, 2016 , Study code: DNA3620 is equivalent
	ILV	LOQ= 0.05 mg/kg	LC-MS/MS	M.Eichler, S. Herman, 2018, Study code:123361101
Animal products, food of animal origin- (Meat, liver, fat)	Primary	LOQ- 0.01 mg/kg	HPLC-MS/MS	Pentz & Cabusas (2012)/ EFSA Journal 2015;13(1):3936/ to which D. Norris, 2016 , Study code: DNA3620 is equivalent
	Confirmatory (if required)	Data gap for additional validation data		
	ILV	LOQ = 0.05 mg/kg matrix	LC-MS/MS	M.Eichler, S. Herman, 2018, Study code:123361101

Comment:

HPLC-MS/MS methods exist for monitoring metsulfuron-methyl in food and feed of plant origin with LOQs of 0.01 mg/kg in all commodities. Residues of metsulfuron-methyl in food of animal origin can be monitored with HPLC-MS/MS methods with LOQs of 0.01 mg/kg in milk, cream, liver, fat and eggs, however a data gap has been identified for additional validation data for the confirmation of the analyte for the analysis of residues in meat, fat and liver/kidney.

EU Conclusions: EU Residue definition in food of plant/animal origin- thifensulfuron methyl

Matrices	**EU Residue definition**		**Reference**
Food of plant origin	Risk assessment	For oilseeds and cereals (weed-control use): Thifensulfuron-methyl and provisionally triazine amine (IN-A4098)	EFSA Journal 2015;13(7):4201

		For Animal feed items (grass / alfalfa): Sum of thifensulfuron-methyl and thifensulfuron acid (IN-L9225), expressed as thifensulfuron-methyl and provisionally triazine amine (IN-A4098)	
	Monitoring	For oilseeds and cereals (weed-control use): Thifensulfuron-methyl (parent only) Although currently no EU MRLs are set for feed commodities, for possible future applicability it is proposed: For Animal feed items (grass / alfalfa): Sum of thifensulfuron-methyl and thifensulfuron acid (IN-L9225), expressed as thifensulfuron-methyl	EFSA Journal 2015;13(7):4201
Food of animal origin	Risk assessment	Sum of thifensulfuron-methyl and thifensulfuron acid (IN-L9225), expressed as thifensulfuron-methyl and provisionally triazine amine (IN-A4098)	EFSA Journal 2015;13(7):4201
	Monitoring	Thifensulfuron-methyl (parent only)	EFSA Journal 2015;13(7):4201

EU Conclusions: Analytical methods for residues of thifensulfuron-methyl of crop/animal orgin

Component of residue definition: thifensulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s) / missing / EU agreed**
Plants, plant products-(Cereals)	Primary	LOQ- 0.01 mg/kg	LC-MS/MS	Task Force: LC-MS/MS – LOQ = 0.01 mg/kg for cereal grain and corn kernels./ to which M.Eichler, S. Herman, Stefanie Schabio, 2015, Study code:103141104 and M.Eichler, S. Herman, Stefanie Schabio, 2015, Study code103142104 are equivalent
Animal products,	Primary	Not required as no MRLs are proposed		

Component of residue definition: thifensulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s) / missing / EU agreed**
food of animal origin- (Eggs, milk, cream)	Confirmatory (if required)			
Animal products, food of animal origin- (Meat, liver, fat)	Primary	Not required.		
	Confirmatory (if required)			

Comment:

HPLC-MS/MS methods exist for monitoring thifensulfuron-methyl in food and feed of plant origin with LOQs of 0.01 mg/kg in all commodities. Residues of metsulfuron-methyl in food of animal origin can be monitored with LC-MS/MS methods with LOQs of 0.01 mg/kg in for soybean seed, olives, corn grain, oranges, lettuce,cereal grain and corn kernels. A method of analysis for products of animal origin is not required as no MRLs are proposed. A method of analysis for body fluids and tissues is not required.

Monitoring/Enforcement methods: **thifensulfuron-methyl**

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes) B.4.2.2, Study AMR 2335-92, E.Bollin and W.G. George (1994) C.R. Powley, N. L. Gagnon (2000)	HPLC/UV (254 nm) method A 10 g (forage, grain) or 5 g (straw) sample was extracted (three times) with 0.1 M potassium phosphate. The combined supernatants were acidified and then centrifuged. The supernatant was filtered and then passed through a previously conditioned C18 Bond Elut solid phase extraction cartridge, which sorbed the thifensulfuron-methyl. Analyte was eluted with 15% acetonitrile / 85% 0.02M potassium phosphate, pH 3. Recovery: 98% ± 6% Limit of quantification: 0.05 ppm for wheat/barley grain and forage; 0.1 ppm for wheat/barley straw. HPLC/UV (254 nm) method Samples are grind and homogenized and extracted with potassium phosphate buffer. The extract is then concentrated and cleaned up by solid phase extraction. Recovery: 85-103% ± 4-11% Limit of quantification: 0.01 ppm for wheat/barley grain and forage; 0.05 ppm for wheat/barley straw.

Additional data on methods/validation in crops for active substances have been provided. All data are considered adequate:

Method validation

Report:	KIIIA1 5.3.1/01, Wójcik M, Winiarska K., Zmijowska A. 2008
Title:	TOTO 75 WG Determination of residues of metsulfuron methyl in wheat grain
Document No:	Study code C/04/08 Institute of Industrial Organic Chemistry, Branch Pszczyna, ul. Doswiadczalna 27, 43-200 Pszczyna, Poland
Guidelines:	GLP, OECD 1997 and SOP /C/133
GLP	Yes

Method

The method is based on reversed phase HPLC/UV.

Protocol

Test material	Grain samples coded FH08PZ115W (winter wheat Boomer) and FH08PZ117R (winter wheat Nutka received on October 29, 2008 in paper bags with full specifications
Analytical standard	Metsulfuron-methyl, series No. 7054X, purity 98.3 %, expiry 23.02.2013) from Riedel-de Haën, accompanied by CoA Thifensulfuron-methyl, series No. 3197X, purity 97.6 %, expiry 10.07.2010) from Riedel-de Haën, accompanied by CoA
Method	**High performance liquid chromatography**
Column	Microsorb-MV 100-5 C18, l = 250 mm, ϕ = 4.6 mm
Mobile phase	acetonitrile : water : orthophosphoric acid (V) (40 : 60 : 0.1; v/v)
Detection	Wavelength: λ = 220 nm
Concentration range	0.05 – 10.0 µg/ml
Flow rate	1.1 mL/min.

Conclusion:

The analytical method for the determination of residues of metsulfuron-methyl and thifensulfuron-methyl in wheat grain may be considered adequate.

Validation

The following validation of the HPLC analytical method for the determination of the active substance in wheat grain matrix was performed.

Specificity:	Chromatograms of control samples of wheat grain, test samples, test samples spiked with metsulfuron-methyl and spiked with thifensulfuron-methyl were superimposed. It was shown that the method is applicable for specific determination of metsulfuron-methyl and thifensulfuron-methyl.
Linearity:	Linear range for metsulfuron-methyl from 0.05 mg/mL, to 10.0 mg/mL [Met] y = +4.820561e+005x [Met] Coeff. Det.(r^2): 0.999953 [Thifen] y = +4.019609e+005x [Thifen] Coeff. Det.(r^2): 0.999928
Average recovery:	[Met] Determined by analysing metsulfuron-methyl added to wheat grain control at 0.050 and 0.50 mg/kg. Recovery was 97.0 and 79.2% respectively. [Thifen] Determined by analysing thifensulfuron-methyl added to wheat grain control at 0.050 and 0.50 mg/kg. Recovery was 97.4 and 88.0% respectively.
Limit of Quantification	0.05 mg/kg wheat grain identified as the lowest concentration giving 70-110% recovery with a relative standard deviation of <20%
Limit of Detection	0.005 mg/kg what grain
Precision:	RSD[Met] = 4.7-5.6%, RSD[Thifen] = 1.9-2.9%

Conclusion:

The analytical method for the determination of residues of metsulfuron-methyl and thifensulfuron-methyl in wheat grain may be considered adequate.

Comments of zRMS: Method is not accepted. Limit of Quantification at 0.05 mg/kg is too high.

Current MRLs, according to Commission Regulation (EU) No 617/2014 of 3 June 2014 are presented in table below:

Crop/ food of animal origin	EU MRL thifensulfuron methyl (mg/kg)	EU MRL metsulfuron methyl (mg/kg)
Wheat (spelt, triticale)	0.01*	0.01*
Rye	0.01*	0.01*

*- limit of quantification

Report:	KIIIA1 5.3.1/02 and KIIIA1 5.3.1/03, M. Eichler, S. Schabio 2015
Title:	TOTO 75 SG Field Residue Decline Study on Wheat Commodities in Central Europe and TOTO 75 SG Field Residue Study on Wheat Commodities in Central Europe
Document No:	Study Project: 103141104 and Study Project: 103141204
Guidelines:	GLP, SANCO 3029/99 rev. 4
GLP	Yes

Summary of the results is presented below:

Test material	2 winter wheat grain and straw samples
Analytical standard	Thifensulfuron-methyl, Dr. Ehrenstorfer, Germany, Batch No: 41031, Expiry Date: January 26, 2019 Metsulfuron-methyl, Dr. Ehrenstorfer, Germany, Batch No: 30829, Expiry Date: August 29, 2019
Method	LC-MS/MS
Column	Gemini 3µ C18 110A (150 * 3 mm)
HPLC Conditions:	Column: Gemini 3µ C18 110A (150 * 3 mm) Mobile Phase: Eluent A: HPLC-grade water + 0.05 % acetic acid Eluent B: Methanol + 0.05 % acetic acid Isocratic Mode: 20 % Eluent A / 80 % Eluent B Flow Rate: 0.3 mL/min Injection Volume: 10 µL Oven Temperature: 40 °C
LC-MS/MS Conditions:	Ion Source: Electrospray, positive Ion Source: 4500 Temperature: 600 °C Mass Transitions: 388 amu to 167 amu (quantifier, Thifensulfuron-methyl) 388 amu to 141 amu (qualifier, Thifensulfuron-methyl) 382 amu to 167 amu (quantifier, Metsulfuron-methyl) 382 amu to 141 amu (quantifier, Metsulfuron-methyl)
Concentration range	0.1 to 10 µg Thifensulfuron-methyl/L 0.1 to 10 µg Metsulfuron-methyl /L

Parameter for Validation of the Chromatographic Method.

Test substance	Thifensulfuron-methyl	Metsulfuron-methyl
Interference	Interferences from solvent blank, i.e. control matrix, were not detected.	Interferences from solvent blank, i.e. control matrix, were not detected.

Calibration Range	0.1 to 10 µg Thifensulfuron-methyl/L	0.1 to 10 µg Metsulfuron-methyl /L
Linearity of Response:	Correlation of peak area of different standard solutions with their corresponding concentrations, using a linear regression	Correlation of peak area of different standard solutions with their corresponding concentrations, using a linear regression.
Regression Coefficient r: Typical Calibration Curve:	0.9999 for quantifier y = 330672 * x + 8747	0.9998 for quantifier y = 405346 * x + 11740
Limit of Detection:	0.011 µg Thifensulfuron-methyl/L corresponding to 0.00022 mg Thifensulfuron-methyl/kg	0.0034 µg Metsulfuron-methyl /L corresponding to 0.000068 mg Metsulfuron-methyl /kg
Limit of Quantification:	10 µg Thifensulfuron-methyl/kg The LOQ is defined as the mean nominal concentration of the lowest validated concentration level.	10 µg Metsulfuron-methyl /kg plant The LOQ is defined as the mean nominal concentration of the lowest validated concentration level
Accuracy of the Analytical Method:	Mean recovery rate of Thifensulfuron-methyl in the fortified plant samples - quantifier: 10 µg Thifensulfuron-methyl/kg plant: 84 % (n = 5; RSD = 6 %) 100 µg Thifensulfuron-methyl/kg plant: 88 % (n = 5; RSD = 7 %) Overall mean recovery: 86 % (n = 10; RSD = 7 %) Mean recovery rate of Thifensulfuron-methyl in the fortified plant samples - qualifier: 10 µg Thifensulfuron-methyl/kg plant: 85 % (n = 5; RSD = 7 %) 100 µg Thifensulfuron-methyl/kg plant: 89 % (n = 5; RSD = 6 %) Overall mean recovery: 87 % (n = 10; RSD = 7 %) Mean recovery rate of Thifensulfuron-methyl in the fortified grains samples - quantifier: 10 µg Thifensulfuron-methyl/kg grains: 84 % (n = 5; RSD = 4 %) 100 µg Thifensulfuron-methyl/kg grains: 89 % (n = 5; RSD = 5 %)	Mean recovery rate of Metsulfuron-methyl in the fortified plant samples - quantifier: 10 µg Metsulfuron-methyl /kg plant: 86 % (n = 5; RSD = 6 %) 100 µg Metsulfuron-methyl /kg plant: 89 % (n = 5; RSD = 6 %) Overall mean recovery: 87 % (n = 10; RSD = 6 %) Mean recovery rate of Metsulfuron-methyl in the fortified plant samples - qualifier: 10 µg Metsulfuron-methyl /kg plant: 86 % (n = 5; RSD = 6 %) 100 µg Metsulfuron-methyl /kg plant: 89 % (n = 5; RSD = 6 %) Overall mean recovery: 88 % (n = 10; RSD = 6 %) Mean recovery rate of Metsulfuron-methyl in the fortified grains samples - quantifier: 10 µg Metsulfuron-methyl/kg grains: 84 % (n = 5; RSD = 4 %) 100 µg Metsulfuron-methyl/kg grains: 91 % (n = 5; RSD = 3 %) Overall mean recovery: 87 % (n = 10; RSD = 5 %)

	Overall mean recovery: 87 % (n = 10; RSD = 7 %) Mean recovery rate of Thifensulfuron-methyl in the fortified grains samples - qualifier: 10 µg Thifensulfuron-methyl/kg grains: 94 % (n = 5; RSD = 4 %) 100 µg Thifensulfuron-methyl/kg grains: 98 % (n = 5; RSD = 4 %) Overall mean recovery: 96 % (n = 10; RSD = 6 %)	Mean recovery rate of Metsulfuron-methyl in the fortified grains samples - qualifier: 10 µg Metsulfuron-methyl/kg grains: 98 % (n = 5; RSD = 5 %) 100 µg Metsulfuron-methyl/kg grains: 100 % (n = 5; RSD = 3 %) Overall mean recovery: 99 % (n = 10; RSD = 4 %)
Precision of the Analytical Method:	Relative standard deviation: 7 % for plants and grains.	Relative standard deviation: 6 % for plants and 5 % for grains.
Storage Stability:	Stability of Thifensulfuron-methyl in plant samples - quantifier: 86 µg Thifensulfuron-methyl/kg plant: 79 % (n = 2; RSD = 8 %) Stability of Thifensulfuron-methyl in plant samples - qualifier: 86 µg Thifensulfuron-methyl/kg plant: 81 % (n = 2; RSD = 7 %)	Stability of Metsulfuron-methyl in plant samples - quantifier: 87 µg Metsulfuron-methyl/kg plant: Stability of Metsulfuron-methyl in plant samples - qualifier: 87 µg Metsulfuron-methyl/kg plant:
Repeatability of Injection:	The standard deviation obtained from a five-fold injection of two single calibration standards was max. 3.3 %.	The standard deviation obtained from a five-fold injection of two single calibration standards was max. 4.2 %.

Conclusion: The Analytical method meets the EU criteria with respect to linearity, precision (repeatability), accuracy (recovery), and specificity. LOQ are 0.01 mg/kg for metsulfuron-methyl and thifensulfron-methyl, which is suitable for MRL of 0.01 mg/kg for cereals.

Study Comments: IIIA 5.3.1/02/03	The method is accepted.
Agreed endpoint: IIIA 5.3.1/02/03	The method was successfully validated for metsulfuron-methyl and thifensulfuron-methyl for use on cereal grain and straw samples LOQ are 0.01 mg/kg for metsulfuron-methyl and thifensulfron-methyl

Report:	KIIIA1 5.3.1/04 , M. Eichler, S. Herrmann, 2018
Title:	Metsulfuron-methyl and Tribenuron-methyl: Independent Laboratory Validation of an Analytical Method for the Determination in Animal Matrices
Document No:	Study Project: 123361101
Guidelines:	GLP, SANCO/825/00 rev. 8.1)
GLP	Yes

Summary of the results is presented below:

Test material	2 animal matrices: Muscle: beef was finely homogenised to generate a fine homogenous paste. Cream: cream was shaken to homogenise the sample
Analytical standard	 Metsulfuron-methyl, Batch No: SZBF054XV, Expiry date: 23.02.2020
Method	LC-MS/MS
Column	Gemini 3µ C18 110A (150 * 3 mm)
LC-MS/MS Conditions:	LC: Agilent Series 1290 pump and autosampler Mass Spectrometer: API 5500 Column: Gemini 3 µ C18 100A (150 * 3 mm * 3 µm) Mobile Phase: A: HPLC-H2O + 0.05 % acetic acid B: Acetonitrile +0.05 % acetic acid Gradient mode: 0 – 1 min: 40 % A / 60 % B 2.5 – 5 min: 5 % A / 95 % B 5.5 – 7 min: 40 % A / 60 % B Flow Rate: 0.7 mL/min Injection Volume: 10 µL Detector: MSD Ion Source: 5500 Mass Transitions: Metsulfuron-methyl: quantifier: 382 m/z → 167 m/z qualifier: 382 m/z → 141 m/z
Concentration range	3 to 100 µg/L for cream 3.75 to 100 µg/L for beef

Parameter for Validation of the Chromatographic Method.

Test substance	Metsulfuron-methyl
Interference	The interference for the determination of the target analytes was not higher than 30 % of total mean peak area at LOQ level.

Calibration Range	Beef: 3.75 to 100 µg Metsulfuron-methyl /L Cream: 3 to 100 µg Metsulfuron-methyl /L Typical Calibration Curves: Metsulfuron-methyl: Beef: y = 475168 * x + 472673 (quantitation mass) y = 133562 * x – 29955 (confirmation mass) Cream: y = 254489 * x + 50935 (quantitation mass) y = 105232 * x + 2801 (confirmation mass)
Linearity of Response:	Correlation coefficient (r) of calibration curve was determined to be at least: beef: 0.9975 cream: 1.000
Limit of Detection:	Beef: 0.009 µg Metsulfuron-methyl /L corresponding to 0.000037 mg Metsulfuron-methyl /kg Cream: 0.020 µg Metsulfuron-methyl /L corresponding to 0.0001 mg Metsulfuron-methyl /kg
Limit of Quantification:	The limit of quantification (LOQ) was determined to be 0.05 mg/kg.

Accuracy of the Analytical Method:

Metsulfuron-methyl in fortified **beef** samples:

Metsulfuron-methyl		**quantifier (382 m/z > 167 m/z)**				**qualifier (382 m/z > 141 m/z)**			
sample description		recovery %	mean recovery %	RSD %		recovery %	mean recovery %	RSD %	
Fortified 0.05 mg/kg	A	95	99	4	(n=6)	109	108	4	(n=6)
Fortified 0.05 mg/kg	B	100				107			
Fortified 0.05 mg/kg	C	102				113			
Fortified 0.05 mg/kg	D	100				112			
Fortified 0.05 mg/kg	E	102				105			
Fortified 0.05 mg/kg	F	94				101			
Fortified 0.1 mg/kg	A	109	101	11	(n=6)	109	103	11	(n=6)
Fortified 0.1 mg/kg	B	102				102			
Fortified 0.1 mg/kg	C	106				106			
Fortified 0.1 mg/kg	D	107				107			
Fortified 0.1 mg/kg	E	81				81			
Fortified 0.1 mg/kg	F	98				98			
Fortified 0.5 mg/kg	G	82	78	6	(n=6)	87	84	6	(n=6)
Fortified 0.5 mg/kg	H	71				75			
Fortified 0.5 mg/kg	I	80				85			
Fortified 0.5 mg/kg	J	80				86			
Fortified 0.5 mg/kg	K	75				86			
Fortified 0.5 mg/kg	L	82				86			
Fortified 5 mg/kg	G	85	77	7	(n=6)	89	86	2	(n=6)
Fortified 5 mg/kg	H	72				83			
Fortified 5 mg/kg	I	73				85			
Fortified 5 mg/kg	J	78				85			
Fortified 5 mg/kg	K	72				85			
Fortified 5 mg/kg	L	81				86			

RSD relative standard deviation

Metsulfuron-methyl in fortified **cream** samples:

Metsulfuron-methyl		quantifier (382 m/z > 167 m/z)				qualifier (382 m/z > 141 m/z)			
sample description		recovery %	mean recovery %	RSD %		recovery %	mean recovery %	RSD %	
Fortified 0.05 mg/kg	A	97	95	1	(n=6)	101	99	1	(n=6)
Fortified 0.05 mg/kg	B	95				99			
Fortified 0.05 mg/kg	C	94				99			
Fortified 0.05 mg/kg	D	96				99			
Fortified 0.05 mg/kg	E	96				101			
Fortified 0.05 mg/kg	F	95				99			
Fortified 0.1 mg/kg	A	96	95	1	(n=6)	99	98	1	(n=6)
Fortified 0.1 mg/kg	B	94				97			
Fortified 0.1 mg/kg	C	94				98			
Fortified 0.1 mg/kg	D	96				99			
Fortified 0.1 mg/kg	E	95				99			
Fortified 0.1 mg/kg	F	94				98			
Fortified 0.5 mg/kg	A	97	96	2	(n=6)	101	100	2	(n=6)
Fortified 0.5 mg/kg	B	97				102			
Fortified 0.5 mg/kg	C	97				101			
Fortified 0.5 mg/kg	D	97				100			
Fortified 0.5 mg/kg	E	93				98			
Fortified 0.5 mg/kg	F	93				98			
Fortified 5 mg/kg	A	98	97	1	(n=6)	103	103	1	(n=6)
Fortified 5 mg/kg	B	96				102			
Fortified 5 mg/kg	C	96				101			
Fortified 5 mg/kg	D	99				104			
Fortified 5 mg/kg	E	98				103			
Fortified 5 mg/kg	F	97				103			

RSD relative standard deviation

Conclusion: The Analytical method meets the EU criteria with respect to linearity, precision (repeatability), accuracy (recovery), and specificity.

Study Comments: IIIA 5.3.1/04	The method is accepted.
Agreed endpoint: IIIA 5.3.1/04	The method was successfully validated for metsulfuron-methyl for use on animal muscle and cream samples LOQ are 0.05 mg/kg for metsulfuron-methyl

Report:	KIIIA1 5.3.1/05, D. Norris, 2016
Title:	Validation of the Methods of Analysis used for the Determination of Metsulfuron-Methyl and Thifensulfuron-methyl in various wheat matrices, in Compliance with Good Laboratory Practice, and referencing SANCO/3029/99.
Document No:	Study Project: DNA3621
Guidelines:	GLP, SANCO 3029/99 rev. 4
GLP	Yes

Summary of the results is presented below:

The method uses a vortexed extraction using a ceramic homogenizer with Acetonitrile and Water. The extracts are dried using QuEChERS salt pouches and centrifuged to create a supernatant for analysis. The samples are then assayed by LC-MS (accurate mass) using an LC-QToF.

2.1.2 Validation Summary for Metsulfuron-Methyl in Grain

The validation parameters for the Metsulfuron-Methyl in Grain methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 2.

Table 2: Validation Summary Table – Metsulfuron-Methyl in Grain

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9988$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.74%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 4.66	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 85.74%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 3.77	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.29%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 2.69	%RSD less than 20
LOQ Recovery at 0.01mg/Kg Metsulfuron-Methyl and Thifensulfuron-Methyl	Mean Recovery = 87.20%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 6.0 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the Molecular Ion, Sodium Adduct and three fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

2.1.2 Validation Summary for Metsulfuron-Methyl in Grain

The validation parameters for the Metsulfuron-Methyl in Grain methodology have b met for this study under the SANCO/3029/99 guidelines. A summary of these res are shown in Table 2.

Table 2: Validation Summary Table – Metsulfuron-Methyl in Grain

Validation Parameter	**Results Obtained**	**Acceptance Criteria under Sanco 3029/99 rev 4**
Linearity	$R^2 = 0.9988$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.74%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 4.66	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 85.74%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 3.77	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.29%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 2.69	%RSD less than 20
LOQ Recovery at 0.01mg/Kg Metsulfuron-Methyl and Thifensulfuron-Methyl	Mean Recovery = 87.20%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 6.0 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the Molecular Ion, Sodium Adduct and three fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

2.1.3 Validation Summary for Metsulfuron-Methyl in Straw

The validation parameters for the Metsulfuron-Methyl in Straw methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 3.

Table 3: Validation Summary Table – Metsulfuron-Methyl in Straw

Validation Parameter	**Results Obtained**	**Acceptance Criteria under Sanco 3029/99 rev 4**
Linearity	$R^2 = 0.9993$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 80.85%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 5.82	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 81.17%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 5.48	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 79.37%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 8.28	%RSD less than 20
LOQ Recovery at 0.01mg/Kg Metsulfuron-Methyl	Mean Recovery = 90.61%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 5.7 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the Molecular Ion, Sodium Adduct and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Whole Plant methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 4.

Table 4: Validation Summary Table –Thifensulfuron-Methyl in Whole Plant

Validation Parameter	**Results Obtained**	**Acceptance Criteria under Sanco 3029/99 rev 4**
Linearity	$R^2 = 0.9993$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 84.64%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 6.12	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 83.24%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 2.52	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 83.74%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 2.75	%RSD less than 20
LOQ Recovery at 0.005mg/Kg Thifensulfuron-Methyl	Mean Recovery = 89.37%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.5 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the Molecular Ion, Sodium Adduct and three fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Grain methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 5.

Table 5: Validation Summary Table – Thifensulfuron-Methyl in Grain

Validation Parameter	**Results Obtained**	**Acceptance Criteria under Sanco 3029/99 rev 4**
Linearity	$R^2 = 0.9996$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 91.73%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 3.16	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 87.23%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 2.04	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 90.93%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 2.91	%RSD less than 20
LOQ Recovery at 0.01mg/Kg Thifensulfuron-Methyl	Mean Recovery = 78.63%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 5.0 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the Molecular Ion, Sodium Adduct and three fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Straw methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 6.

Table 6: Validation Summary Table – Thifensulfuron-Methyl in Straw

Validation Parameter	**Results Obtained**	**Acceptance Criteria under Sanco 3029/99 rev 4**
Linearity	$R^2 = 0.9961$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 78.07%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 6.75	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 85.00%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 6.32	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 78.98%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 5.33	%RSD less than 20
LOQ Recovery at 0.01mg/Kg Metsulfuron-Methyl	Mean Recovery = 87.11%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.8 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the Molecular Ion, Sodium Adduct and three fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

Conclusion: The Analytical method meets the EU criteria with respect to linearity, precision (repeatability), accuracy (recovery), and specificity.

Study Comments: IIIA 5.3.1/05	The method is accepted.
Agreed endpoint: IIIA 5.3.1/05	The method was successfully validated for metsulfuron-methyl and thifensulfuron-methyl for use on cereal grain, straw and whole plant samples. LOQ are 0.01 mg/kg for metsulfuron-methyl and thifensulfron-methyl

Report:	KIIIA1 5.3.1/06, D. Noris, 2016
Title:	Validation of the Methods of Analysis used for the Determinatio of Metsulfuron-methyl, Thifensulfuron-methyl and Tribenuron-Methyl in various matrices, in Compliance with Good Laboratory Practice, and referencing SANCO/3029/00
Document No:	Study Project: DNA3620
Guidelines:	GLP, SANCO 3029/99 rev. 4
GLP	Yes

Summary of the results is presented below:

The validation parameters for the Metsulfuron-Methyl in Eggs methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 1.

Table 1: Validation Summary Table – Metsulfuron-Methyl in Eggs

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	R^2 = 0.9985	R^2 = >0.99
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 91.39%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 2.069	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.39%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 3.090	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 90.61%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 2.863	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Metsulfuron-Methyl	Mean Recovery = 89.57%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 4.9 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Metsulfuron-Methyl in Milk methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 2.

Table 2: Validation Summary Table – Metsulfuron-Methyl in Milk

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9992$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 80.64%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 5.401	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 75.75%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 3.303	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 80.21%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 5.343	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Metsulfuron-Methyl	Mean Recovery = 90.49%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 4.5 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Metsulfuron-Methyl in Cream methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 3.

Table 3: Validation Summary Table – Metsulfuron-Methyl in Cream

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9996$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 97.92%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 2.322	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 99.32%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 3.653	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 98.57%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 5.228	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Metsulfuron-Methyl	Mean Recovery = 98.25%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 4.7 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Metsulfuron-Methyl in Liver methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 4.

Table 4: Validation Summary Table – Metsulfuron-Methyl in Liver

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9996$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 90.91%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 3.435	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 88.82%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 4.793	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 92.03%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 2.959	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Metsulfuron-Methyl	Mean Recovery = 95.41%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 4.6 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Metsulfuron-Methyl in Muscle methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 5.

Table 5: Validation Summary Table – Metsulfuron-Methyl in Muscle

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9994$	$R^2 = >0.99$
Recovery at 5mg/Kg Metsulfuron-Methyl	Mean Recovery = 94.44%	Between 70%-110%
Precision at 5mg/Kg Metsulfuron-Methyl	%RSD = 3.296	%RSD less than 20
Recovery at 0.5mg/Kg Metsulfuron-Methyl	Mean Recovery = 93.47%	Between 70%-110%
Precision at 0.5mg/Kg Metsulfuron-Methyl	%RSD = 2.092	%RSD less than 20
Recovery at 0.1mg/Kg Metsulfuron-Methyl	Mean Recovery = 94.48%	Between 70%-110%
Precision at 0.1mg/Kg Metsulfuron-Methyl	%RSD = 1.964	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Metsulfuron-Methyl	Mean Recovery = 96.72%	Between 70%-110%
Specificity	Metsulfuron-Methyl eluted at 4.4 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Metsulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Metsulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Eggs methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 6.

Table 6: Validation Summary Table –Thifensulfuron-Methyl in Eggs

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9976$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 89.00%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 2.522	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 89.50%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 4.116	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 93.28%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 3.563	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Thifensulfuron-Methyl	Mean Recovery = 93.64%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.3 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Milk methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 7.

Table 7: Validation Summary Table – Thifensulfuron-Methyl in Milk

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9976$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 88.39%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 5.602	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 85.92%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 2.418	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 89.05%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 7.005	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Thifensulfuron-Methyl	Mean Recovery = 83.68%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.1 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Cream methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 8.

Table 8: Validation Summary Table – Thifensulfuron-Methyl in Cream

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9982$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 98.81%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 4.483	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 100.3%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 3.119	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 97.32%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 7.921	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Thifensulfuron-Methyl	Mean Recovery = 94.18%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.1 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Liver methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 9.

Table 9: Validation Summary Table – Thifensulfuron-Methyl in Liver

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9994$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 89.43%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 3.082	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 90.99%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 3.040	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 90.52%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 3.927	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Thifensulfuron-Methyl	Mean Recovery = 94.98%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 4.1 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

The validation parameters for the Thifensulfuron-Methyl in Muscle methodology have been met for this study under the SANCO/3029/99 guidelines. A summary of these results are shown in Table 10.

Table 10: Validation Summary Table – Thifensulfuron-Methyl in Muscle

Validation Parameter	Results Obtained	Acceptance Criteria under Sanco 3029/99 rev 4
Linearity	$R^2 = 0.9986$	$R^2 = >0.99$
Recovery at 5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 96.48%	Between 70%-110%
Precision at 5mg/Kg Thifensulfuron-Methyl	%RSD = 2.736	%RSD less than 20
Recovery at 0.5mg/Kg Thifensulfuron-Methyl	Mean Recovery = 94.69%	Between 70%-110%
Precision at 0.5mg/Kg Thifensulfuron-Methyl	%RSD = 2.737	%RSD less than 20
Recovery at 0.1mg/Kg Thifensulfuron-Methyl	Mean Recovery = 94.96%	Between 70%-110%
Precision at 0.1mg/Kg Thifensulfuron-Methyl	%RSD = 3.838	%RSD less than 20
LOQ Recovery at 0.05mg/Kg Thifensulfuron-Methyl	Mean Recovery = 94.90%	Between 70%-110%
Specificity	Thifensulfuron-Methyl eluted at 3.8 minutes. The compound was specifically extracted from the chromatogram using accurate high resolution mass spectrometry, and there were no other peaks present at the same elution time as Thifensulfuron-Methyl	To show no interference
Selectivity (Spectral Analysis)	The High Resolution MS spectra for Thifensulfuron-Methyl show the primary ion and four fragment ions to confirm the species identification	To confirm the species identity in the associated spectra traces

Conclusion: The Analytical method meets the EU criteria with respect to linearity, precision (repeatability), accuracy (recovery), and specificity.

Study Comments: IIIA 5.3.1/06	The method is accepted.
Agreed endpoint: IIIA 5.3.1/06	The method was successfully validated for metsulfuron-methyl and thifensulfuron-methyl for use on milk, eggs, cream, muscle and liver samples. LOQ are 0.05 mg/kg for metsulfuron-methyl and thifensulfron-methyl

IIIA 5.3.2 Storage stability of working solutions in analytical methodology

All analytical methods are active substance data, were provided in the EU review of metsulfuron-methyl and were considered adequate.

IIIA 5.4 Description of Methods for the Analysis of Soil

EU Conclusions:
Monitoring/Enforcement methods: **metsulfuron-methyl**

Soil B.4.3.1, AMR 2885-93, S.J. Amoo (1944)	HPLC/UV (254 nm) method Soil samples (200 g) were extracted with 50% acetonitrile/50% methylene chloride. After centrifugation, the sample solvent was evaporated. A liquid-liquid extraction using 10 mM potassium phosphate buffer was carried out. The aqueous layer was analysed by HPLC after centrifugation at 0 ºC. Recovery: 79-108% ± 9%; Limit of quantification: 0.1 ppb.

EU Conclusions: EU Residue definition in soil – metsulfuron methyl

Matrices	**EU Residue definition**		**Reference**
Soil	Risk assessment	Metsulfuron-methyl, triazine urea (IN-V7160), metsulfuron (IN-F5438), methyl saccharin (IN-D5803), saccharin (IN-00581), metsulfuron methyl triazine amine (IN-A4098; [coded AE F059411 in some studies]), carbamoyl guanidine (IN-NC148) , O-demethyl metsulfuron methyl (IN-B5067)	EFSA Journal 2015;13(1):3936
	Monitoring	metsulfuron methyl	EFSA Journal 2015;13(1):3936

EU Conclusion: Analytical methods for analysis of soil- metsulfuron methyl

Component of residue definition: metsulfuron methyl

Matrix type	Method type	Method LOQ	Principle of method (i.e. GC-MS or HPLC-UV)	Author(s), year / missing / EU agreed
Soil	Primary	LOQ- 0.05 µg/kg	LC-MS/MS	~~Sadgrove (2012a)/ EFSA Journal 2015;13(1):3936/~~ Hill, S.J. Stry J.J. 2001a/ old unprotected study
	Confirmatory (if required)	Same as primary		

EU Conclusions: EU Residue definition in soil – thifensulfuron methyl

Matrices	EU Residue definition		Reference
Soil	Risk assessment	Thifensulfuron methyl, IN-L9225, IN-JZ789, IN-A4098 , N-L9223, 2-acid-3-triuret, IN-W8268, IN-V7160 (soil photolysis)	EFSA Journal 2015;13(7):4201
	Monitoring	Thifensulfuron-methyl	EFSA Journal 2015;13(7):4201

EU Conclusion: Analytical methods for analysis of soil

Component of residue definition: thifensulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Soil	Primary	LOQ- 0.05 µg/kg	LC-MS/MS	~~DuPont:~~ ~~LC-MS/MS – LOQ = 0.05 µg /kg for soil/ Hill, Stry~~ ~~Task Force:~~ ~~LC-MS/MS – LOQ = 0.005 mg/kg for soil~~ Hill, S.J. Stry J.J. 2001a/ old unprotected study

EU Conclusions:
Monitoring/Enforcement methods: **thifensulfuron-methyl**

B.4.3.1, AMR 1550-89, L.R.Proksch and M.P. Wadsley (1991)	HPLC/UV (230 nm) method Soil samples (400 g) were extracted with 50% acetonitrile/50% methylene chloride. After evaporation, the sample solvent was evaporated and diluted with carbon tetrachloride. A liquid-liquid extraction using

	10 mM potassium phosphate buffer was carried out. The aqueous layer was analysed by HPLC. Recovery: 94% ± 15%; Limit of quantification: 0.1 ppb.
C.R. Powley et al. (1995)	HPLC/UV (245 nm) method Soil samples were extracted with ammonium carbonate solution. The extract is cleaned up on C18 and silica Mega Bond-elut cartriges. Recovery: 76-91% ± 4-13% Limit of quantification: 1.0 ppb

Summary
All analytical methods are active substance data and were provided in the EU review of metsulfuron-methyl and thifensulfuron-methyl and were considered adequate.

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Study Comments: IIIA 5.4/01	Information is accepted
Agreed endpoint: IIIA 5.4/01	

IIIA 5.5 Description of Methods for the Analysis of Sediment

This is not an EC data requirement/ not required by Directive 91/414/EEC.

IIIA 5.6 Description of Methods for the Analysis of Water

EU Conclusions: Analytical methods for analysis of water [Met]

Water B.4.3.1, AMR 1274-88, J.R. Wheeler, L.M. Shalaby and M.P. Wadsley (1988)	HPLC/UV (200 nm) method A 1 litre water sample was washed twice with hexane. The sample was acidified and then extracted (4 times) with methylene chloride. The methylene chloride phase (containing metsulfuron methyl) was evaporated to dryness. Samples were reconstituted in 30% acetonitrile/70% water for analysis. Recovery: 82-103% ± 8%; Limit of quantification: 10 ppt.

EU Conclusions: EU Residue definition in surface water and sediment- thifensulfuron methyl

Matrices	EU Residue definition		Reference
Surface water	Risk assessment	Thifensulfuron methyl, IN-L9225, IN-JZ789, IN-A4098 , N-L9223, 2-acid-3-triuret, IN-W8268, IN-V7160 (soil photolysis) IN-L9226 IN-A5546 IN-D8858(aqueous photolysis) IN-B5528(hydrolysis, pH4 and 20°C)	EFSA Journal 2015;13(7):4201
	Monitoring	thifensulfuron methyl	EFSA Journal 2015;13(7):4201

EU Conclusions: EU Residue definition in ground water- thifensulfuron methyl

Matrices	EU Residue definition		Reference
Ground water	Risk assessment	Thifensulfuron methyl, IN-L9225, IN-JZ789, IN-A4098 , N-L9223, 2-acid-3-triuret, IN-W8268, IN-V7160 (soil photolysis) IN-L9226 IN-A5546	EFSA Journal 2015;13(7):4201
	Monitoring	thiefansulfuron methyl	EFSA Journal 2015;13(7):4201

EU Conclusion: Analytical methods for analysis in water

Component of residue definition: thifensulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Surface and drinking water	Primary	LOQ-0.05 µg/L	LC-MS/MS	**DuPont:** LC-MS/MS – LOQ = 0.05 µg/L for both drinking and surface water

				Devine & Jin (2004)/ old unprotected study

EU Conclusions:
Monitoring/Enforcement methods: **thifensulfuron-methyl**

Water Wadsley, J.R. Wheeler, L.M. Shalaby and F.Q Bramble (1988)	HPLC/UV (200 nm) method A 1 litre water sample was washed twice with hexane. The sample was acidified and then extracted (4 times) with methylene chloride. The methylene-chloride phase (containing thifensulfuron-methyl) was evaporated to dryness. Samples were reconstituted in 20% acetonitrile/80% water for analysis. Recovery: 98% ± 16% Limit of quantification: 0.050 ppb
C.R. Powley et al. (1995)	HPLC/UV (245 nm) method SPE extraction ; Recovery: 92-105% ± 3-13%; Limit of quantification: 0.2 µg/L

EU Conclusions: EU Residue definition in surface water and sediment- metsulfuron methyl

Matrices	**EU Residue definition**		**Reference**
Surface water	Risk assessment	Metsulfuron-methyl, triazine urea (IN-V7160), metsulfuron (IN-F5438), methyl saccharin (IN-D5803), saccharin (IN-00581), metsulfuron methyl triazine amine (IN-A4098; [coded AE F059411 in some studies]), carbamoyl guanidine (IN-NC148) , O-demethyl metsulfuron methyl (IN-B5067) bis-O-demethyl metsulfuron methyl (IN-JX909) (water)	EFSA Journal 2015;13(1):3936
	Monitoring	metsulfuron-methyl	EFSA Journal 2015;13(1):3936

EU Conclusions: EU Residue definition in ground water- metsulfuron methyl

Matrices	EU Residue definition		Reference
Ground water	Risk assessment	Metsulfuron-methyl, triazine urea (IN-V7160), metsulfuron (IN-F5438), methyl saccharin (IN-D5803), saccharin (IN-00581), metsulfuron methyl triazine amine (IN-A4098; [coded AE F059411 in some studies]), carbamoyl guanidine (IN-NC148) , O-demethyl metsulfuron methyl (IN-B5067)	EFSA Journal 2015;13(1):3936
	Monitoring	metsulfuron-methyl	EFSA Journal 2015;13(1):3936

EU Conclusion: Analytical methods for analysis in water

Component of residue definition: metsulfuron methyl				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Surface water	Primary	LOQ-0.05 µg/L	HPLC-MS/MS	Devine & Jin (2004)/ EFSA Journal 2015;13(1):3936
	Confirmatory (if required)			~~Henze & Stry (2010)/ EFSA Journal 2015;13(1):3936~~/ Not required
Ground water	Primary	LOQ-0.05 µg/L	HPLC-MS/MS	~~Sadgrove (2012), EFSA Journal 2015;13(1):3936/~~ Devine & Jin (2004)/ old unprotected study
	Confirmatory (if required)			~~Sadgrove (2012), EFSA Journal 2015;13(1):3936~~/ Not required

Summary

All analytical methods are active substance data and were provided in the EU review of metsulfuron-methyl and thifensulfuron-methyl and were considered adequate.

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Study Comments: IIIA 5.6/01	Information is accepted
Agreed endpoint: IIIA 5.6/01	

IIIA 5.7 Description of Methods for the Analysis of Air

No method for air monitoring is necessary since metsulfuron-methyl and thifensulfuron-methyl are not volatile

EU Conclusions: EU Residue definition in air- metsulfuron methyl

Matrices	**EU Residue definition**	**Reference**
Air	No required.	EFSA Journal 2015;13(1):3936

EU Conclusion: Analytical methods for analysis of air.

Component of residue definition: None				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Air	Primary	LOQ-0.75µg/m3	LC-MS/MS	Bacher (2001) old unprotected study / EFSA Journal 2015;13(1):3936
	Confirmatory (if required)			~~Henze & Stry (2010)/ EFSA Journal 2015;13(1):3936/~~ Not required

EU Conclusions: EU Residue definition in air- thifensulfuron methyl

Matrices	**EU Residue definition**		**Reference**
Air	Risk assessment	Thifensulfuron methyl	EFSA Journal 2015;13(7):4201
	Monitoring	thiefansulfuron methyl	EFSA Journal 2015;13(7):4201

EU Conclusion: Analytical methods for analysis of air.

Component of residue definition: thifensulfuron methyl

Matrix type	Method type	Method LOQ	Principle of method (i.e. GC-MS or HPLC-UV)	Author(s), year / missing / EU agreed
Air	Primary	LOQ = 2.8 µg/m3for air	LC-MS/MS	DuPont: LC-MS/MS – LOQ = 2.8 µg/m3for air EFSA Journal 2015;13(7):4201/ BACHER 2001

Summary

All analytical methods are active substance data and were provided in the EU review of metsulfuron-methyl and thifesulfuron methyl were considered adequate

Study Comments: IIIA 5.7/01	Information is accepted
Agreed endpoint: IIIA 5.7/01	

IIIA 5.8 Description of Methods for the Analysis of Body Fluids and Tissues

EU conclusion: not necessary

EU Conclusion: Analytical methods for analysis of animal products, food of animal origin

Component of residue definition: Not required.				
Matrix type	**Method type**	**Method LOQ**	**Principle of method (i.e. GC-MS or HPLC-UV)**	**Author(s), year / missing / EU agreed**
Body fluids, air, operator, bystander exposure (Exposure)	N/A	Not required		

IIIA 5.9 Other/Special Studies

There are no additional European requirements for formulated products.

Appendix 1 – List of data submitted in support of the evaluation

Annex point	**Author**	**Year**	**Title** **Source (where different from company)** **Company, Report No.** **GLP or GEP status (where relevant)** **Published or Unpublished**	**Data protection claimed Y/N**	**Owner**
IIIA 5.1.1/01	Oleksa G.	2010	Development and validation of a method for determination of metsulfuron-methyl and thifensulfuron-methyl in TOTO 75 BA –11/10, Institute of Industrial Organic Chemistry, Analytical Department, 6 Annopol Str., 03-236 Warsaw, Poland Report to GLP Unpublished	N	Chemirol
IIIA 5.2.1/02	Oleksa G.	2010	Development and validation of a method for determination of metsulfuron-methyl and thifensulfuron-methyl in TOTO 75 BA – 11/10, Institute of Industrial Organic Chemistry, Analytical Department, 6 Annopol Str., 03-236 Warsaw, Poland Report to GLP Unpublished	N	Chemirol
IIIA 5.3.1/01	Wojcik M.	2008	TOTO 75 WG Determination of residues of metsulfuron methyl and thifensulfuron-methyl in wheat grain Study code C/05/08 Institute of Industrial Organic Chemistry, Branch Pszczyna, ul. Doswiadczalna 27, 43-200 Pszczyna, Poland Report to GLP Unpublished	N	Chemirol

Annex point	Author	Year	Title Source (where different from company) Company, Report No. GLP or GEP status (where relevant) Published or Unpublished	Data protection claimed Y/N	Owner
IIIA 5.3.1/02	M. Eichler, S. Schabio	2015	TOTO 75 SG Field Residue Decline Study on Wheat Commodities in Central Europe IBACON GmbH Arheilger Weg 17 64380 Rossdorf Germany Study Project: 103141104 STUDY PLAN/ GLP Unpublished	Y	Chemirol
IIIA 5.3.1/03	M. Eichler, S. Schabio	2015	TOTO 75 SG Field Residue Study on Wheat Commodities in Central Europe IBACON GmbH Arheilger Weg 17 64380 Rossdorf Germany Study Project: 103141204 STUDY PLAN/GLP Unpublished	Y	Chemirol

Annex point	Author	Year	Title Source (where different from company) Company, Report No. GLP or GEP status (where relevant) Published or Unpublished	Data protection claimed Y/N	Owner
IIIA 5.3.1/04	Dr. Matthias Eichler Silke Herrmann	2018	Metsulfuron-methyl and Tribenuron-methyl: Independent Laboratory Validation of an Analytical Method for the Determination in Animal Matrices Ibacon GmbH Arheilger Weg 17 64380 Rossdorf Germany Study No. 123361101 GLP Unpublished	Y	Chemirol
IIIA 5.3.1/05	David Norris	2016	Validation of the Methods of Analysis used for the Determination of Metsulfuron-Methyl and Thifensulfuron-methyl in various wheat matrices, in Compliance with Good Laboratory Practice, and referencing SANCO/3029/99. David Norris Analytical Laboratories Ltd., Units 13-15, Swan Business Park, Sandpit Road, Dartford, Kent, DA1 5ED Study Number: DNA3621 GLP Unpublished	Y	Chemirol

Annex point	Author	Year	Title Source (where different from company) Company, Report No. GLP or GEP status (where relevant) Published or Unpublished	Data protection claimed Y/N	Owner
IIIA 5.3.1/06	David Norris	2016	Validation of the Methods of Analysis used for the Determination of Metsulfuron-Methyl, Thifensulfuron-Methyl and Tribenuron-Methyl in various matrices matrices, in Compliance with Good Laboratory Practice, and referencing SANCO/3029/99. David Norris Analytical Laboratories Ltd., Units 13-15, Swan Business Park, Sandpit Road, Dartford, Kent, DA1 5ED Study Number: DNA3620 GLP Unpublished	Y	Chemirol

Appendix 2: Critical Uses – justification and GAP tables

PPP (product name/code): TOTO / TYTAN / HERKULES

Active substance(s) (name and content, g/L or g/kg): Metsulfuron-methyl and Thifensulfuron-methyl

Formulation type: SG

Field of use: cereals

Zone(s): central

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product / ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
1													
2													
3													
4													
Field uses													
1	PL, SK	Winter wheat	F	weeds	spray medium	PL: BBCH 21-31 SK: BBCH 22-31	1	N/A	a) 0,09 b) 0,09	a) thifensulfuron methyl 61,4 g + metsulfuron methyl 6,1 g b) thifensulfuron methyl 61,4 g + metsulfuron methyl 6,1 g	200-300	N/A	PL: plus adiuvant ASYSTENT+90 EC in dose 0,1l/ha
2	PL, SK	Winter triticale	F	Weeds	spray medium	BBCH 21 -31	1	N/A	a) 0,09 b) 0,09	a) thifensulfuron methyl 61,4 g + metsulfuron			PL: plus adiuvant PARTNER+ in dose 0,5 l/ha SK – extention of

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product / ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
										methyl 6,1 g b) thifensulfuron methyl 61,4 g + metsulfuron methyl 6,1 g			registration is currently pending
3	PL, SK	Winter rye	F	Weeds	spray medium	BBCH 21 -31	1	N/A	a) 0,09 b) 0,09	a) thifensulfuron methyl 61,4 g + metsulfuron methyl 6,1 g b) thifensulfuron methyl 61,4 g + metsulfuron methyl 6,1 g			PL: plus adiuvant PARTNER+ in dose 0,5 l/ha SK – extention of registration is currently pending
4	PL, SK	Winter rye	F	Weeds	spray medium	BBCH 21 -31	1	N/A	a) 0,07 b) 0,07	a) thifensulfuron methyl 47,7 g + metsulfuron			SK – extention of registration is currently pending: Tank Mix with Galaper (fluroksypyr) 250 EC in dose 0,25 l of

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product / ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
										methyl 4,8 g b) thifensulfuron methyl 47,7 g + metsulfuron methyl 4,8 g			product /ha PL: Tank Mix with Galaper (fluroksypyr) 250 EC in dose 0,25 l of product /ha + adiuvant Partner+ in dose 0,5 l/ha
5	PL, SK	Winter triticale	F	Weeds	spray medium	BBCH 21 -31	1	N/A	a) 0,07 b) 0,07	a) thifensulfuron methyl 47,7 g + metsulfuron methyl 4,8 g b) thifensulfuron methyl 47,7 g + metsulfuron			SK – extention of registration is currently pending: Tank Mix with Galaper (fluroksypyr) 250 EC in dose 0,25 l of product /ha

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product / ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
										methyl 4,8 g			PL: Tank Mix with Galaper (fluroksypyr) 250 EC in dose 0,25 l of product /ha + adiuvant Partner+ in dose 0,5 l/ha
EU-wide uses (use on sowing seed, in greenhouses (or other closed places of plant production), as post-harvest treatment or for treatment of empty storage rooms)													
3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-
Minor uses according to article 51													
5	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 3

No additional data/information was provided.