Draft Assessment Report

Evaluation of Active Substances

Plant Protection Products

Prepared according to **assimilated Regulation No 1107/2009**
as it applies in Great Britain

Inpyrfluxam

List of Endpoints

Great Britain

March 2026

Version History

When	What
November 2025	Initial DAR
March 2026	Updates made after ECP

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 1 Identity, Physical/ Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Competent Authority	Month and year	Active Substance (Name)
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Section 1 Identity, Physical/ Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Background

This template for the List of Endpoints reflects the new data requirements for active substances and plant protection products as set out in Commission Regulations (EU) No 283/2013 and 284/2013 of 1 March 2013, in accordance with assimilated Regulation No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market

This template should be used in conjunction with the

- TEMPLATE TO BE USED FOR ASSESSMENT REPORTS (SANCO/12592/2012)
- TEMPLATE TO BE USED FOR ASSESSMENT REPORTS REGARDING LEVEL 3 OF VOLUME 1 (SANCO/11114/2012).

It is envisaged that there will be a general review of the templates for the List of Endpoints within the next years.

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Implementing Schedule

This document as regards the list of endpoints for chemical active substances has been finalised in the Standing Committee on Plants, Animals, Food and Feed on 11 July 2014. The list of endpoints for microorganisms has been finalised in the Standing Committee on Plants, Animals, Food and Feed on 12 December 2014.

This template should be used for assessment reports prepared for active substances for which an application for the approval or renewal of approval has been submitted as from 1 March 2015.

Preferably these templates should also be used for assessment reports for all active substances (chemicals as well as microorganisms):

- For which an application for approval has been submitted after 1 January 2014 (i.e. an application according to the data requirements as laid down in Regulation (EU) No 283/2013 and No 284/2013),

- covered by Commission Regulation (EU) No 844/2012 setting out the provisions necessary for the implementation of the renewal procedure for active substances, as provided for in assimilated Regulation No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market for which an application for the renewal of approval has been submitted before 1 March 2015.

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

Active substance (ISO Common Name)	Inpyrfluxam
Function (e.g. fungicide)	Fungicide

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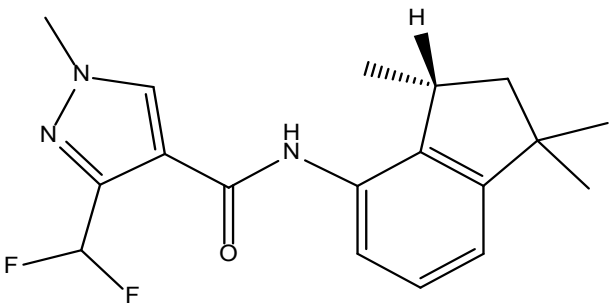
Identity (Regulation (EU) N° 283/2013, Annex Part A, point 1)

Chemical name (IUPAC)	3-(Difluoromethyl)-1-methyl-*N*-[(3*R*)-1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-yl]-1*H*-pyrazole-4-carboxamide
Chemical name (CA)	3-(Difluoromethyl)-*N*-[(3*R*)-2,3-dihydro-1,1,3-trimethyl-1*H*-inden-4-yl]-1-methyl-1*H*-pyrazole-4-carboxamide
CIPAC No	1005
CAS No	1352994-67-2
EC No (EINECS or ELINCS)	875-886-2
FAO Specification	n/a
Minimum purity of the active substance as manufactured	940 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	n/a
Molecular formula	$C_{18}H_{21}F_2N_3O$
Molar mass	333.38 g/mol
Structural formula	

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

Melting point (purity)	104°C (99.9%)
Boiling point (purity)	Boiling point could not be determined as decomposition occurs prior to boiling from approximately 237°C (99.9%)
Temperature of decomposition (purity)	Decomposition occurs prior to boiling from approximately 237°C (99.9%)
Appearance (purity)	Purified material: Beige granule (25°C, 99.9%) Technical material: White powder (20°C, 95.0%)
Vapour pressure (temperature, purity)	3.8×10^{-8} Pa at 20°C (99.9%) 1.2×10^{-7} Pa at 25°C (99.9%)
Henry's Law constant (temperature)	7.74×10^{-7} $Pa.m^3mole^{-1}$ (20°C)
Solubility in water (temperature, purity and pH)	1.64×10^{-2} g/L at 20°C (pH 5.5-5.8) (99.9%)
Solubility in organic solvents (temperature, purity)	Solubility of technical material (95.0%) at 20°C. in acetone: 621 g/L in dichloromethane: 353 g/L in ethyl acetate: 396 g/L in n-hexane: 0.982 g/L in methanol: 368 g/L in n-octanol: 84.6 g/L in toluene: 67.9 g/L

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Surface tension (concentration and temperature, purity)	60.4 mN/m at 21.3°C (90 % saturated solution) (99.9%)
Partition coefficient (temperature, pH and purity)	Log Pow = 3.65 at 25 ºC (pH 7.1-7.3) (99.9%)
Dissociation constant (purity)	Not applicable
UV/VIS absorption (max.) incl. ε (purity, pH)	Purity : 99.9% Acidic solution: 242 λ_{max} (nm); 1.05 x 10^4 ε (L mol^{-1} cm^{-1}) 290 λ_{max} (nm); 1.31 x 10^3 ε (L mol^{-1} cm^{-1}) Neutral solution: 242 λ_{max} (nm); 1.04 x 10^4ε (L mol^{-1} cm^{-1}) 290 λ_{max} (nm); 1.33 x 10^3 (L mol^{-1} cm^{-1}) Alkaline solution: 242 λ_{max} (nm); 1.06 x 10^4 ε (L mol^{-1} cm^{-1}) 290 λ_{max} (nm); 1.33 x 10^3 (L mol^{-1} cm^{-1}) No absorbance was observed above 300 nm.
Flammability (purity)	Not flammable (95%)
Explosive properties (purity)	~~*To be confirmed. Nov 2025*~~ Not explosive (97.8%)
Oxidising properties (purity)	Not oxidising (95%)

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

Substance	Name
Mandatory classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process as applicable in GB.	~~Classification to be confirmed upon submission of explosive properties data.~~ No mandatory classification required with regard to the physical and chemical data.
GB Authority proposal[1] for mandatory classification according to Regulation (EC) No 1272/2008 as applicable in GB:	~~Classification to be confirmed upon submission of explosive properties data.~~ No mandatory classification required with regard to the physical and chemical data.

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

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Summary of representative uses evaluated, for which all risk assessments needed to be completed (name of active substance or the respective variant)

(Regulation (EU) N° 284/2013, Annex Part A, points 3, 4)

Crop and/or situation (a)	GB or country For IT	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.i. (i)	method kind (f-h)	Timing/ Growth Stages & season (j)	number min-max (k)	Interval between application (min)	kg a.s /hL min-max (l)	Water Volume L/ha min-max	g a.s./ha min-max (l) a) max rate per appl b) max total rate per crop/season		
Winter wheat (TRZAW), Spring wheat (TRZAS), Durum wheat (TRZDU)	GB	S-2399 60 g/L EC	F	*Puccinia recondita* (PUCCRE) *Puccinia striiformis* (PUCCSI)	EC	60 g/L	Foliar spray	GS 30-71 Spring	1	N/A	1.5	75-300	90	35	-
Winter barley (HORVW), Spring barley spring (HORVS)	GB	S-2399 60 g/L EC	F	*Puccinia hordei* (PUCCHD)	EC	60 g/L	Foliar spray	GS 30-71 Spring	1	N/A	1.5	75-300	90	35	-

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(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 glass house (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. fluoroxypyr). 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 stages 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

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Summary of additional intended uses for which MRL applications have been made, that in addition to the uses above, have also been considered in the consumer risk assessment (name of active substance or the respective variant)

Assimilated Regulation No 1107/2009 Article 8.1(g))

MRLs have been proposed based on GB uses (Table 1.5.1) of barley and wheat. MRLs are not required to cover any residues expected in rotational crops, livestock or honey and so the proposed default MRLs apply for these other commodities – see Volume 1, Section 2.7.12.

HSE will cover MRLs assessment for any further crops or uses that need to be considered outside of this assessment for the representative intended uses on wheat and barley.

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Further Information, Efficacy

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

	The representative uses/ GAPs are supported.

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

	The representative uses/ GAPs are supported.

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

	The representative uses/ GAPs are supported.

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

Activity against target organism	Met 1	Met 2	Met 3	Met 4	Met 5	Met 6
	No	N/A	N/A	N/A	N/A	N/A

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Methods of Analysis

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

Technical a.s. (analytical technique)	HPLC-UV
Impurities in technical a.s. (analytical technique)	HPLC-UV and GC-FID
Plant protection product (analytical technique)	HPLC-UV
Impurities in plant protection product (analytical technique)	Not applicable

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

Residue definitions for enforcement purposes

Food of plant origin	Inpyrfluxam
Food of animal origin	Inpyrfluxam
Honey	n/a
Soil	Inpyrfluxam, 1'-COOH-S-2840 (sum of isomers)
Sediment	n/a
Water surface	Inpyrfluxam
Drinking / Ground	Inpyrfluxam
Air	Inpyrfluxam

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Body fluids and tissues	1'-COOH-S-2840 (sum of isomers)

Monitoring / Enforcement Methods

Food/feed of plant origin (analytical technique and LOQ)	HPLC-MS/MS (QuEChERS) LOQ = 0.01 mg/kg wheat (grain), cucumber, soybean (seeds), grapes ILV: as above
Food/feed of animal origin (analytical technique and LOQ)	HPLC-MS/MS (QuEChERS) LOQ = 0.01 mg/kg bovine whole milk, poultry eggs, bovine fat, bovine muscle meat, bovine liver ILV: LOQ = 0.01 mg/kg bovine fat, bovine liver
Honey (analytical technique and LOQ)	None provided/required
Soil (analytical technique and LOQ)	HPLC-MS/MS LOQ = 0.002 mg/kg (0.001 mg/kg for both 1'-COOH-S-2840 A and 1'-COOH-S-2840 B)
Water (analytical technique and LOQ)	HPLC-MS/MS LOQ = 0.03 µg/L surface and ground water. ILV: as above
Air (analytical technique and LOQ)	HPLC-MS/MS LOQ = 0.83 µg/m^3
Body fluids and tissues (analytical technique and LOQ)	Body fluids: HPLC-MS/MS LOQ: 0.01 mg/L (total isomer) (porcine urine) Body tissue: HPLC-MS/MS: LOQ: 0.01 mg/kg (total isomer; 0.005 mg/kg

	1'-COOH-S2840A and 0.005 mg/kg 1'-COOH-S2840B). ~~For poultry and bovine muscle and liver.~~ **~~This will be confirmed once additional data is submitted to address validation requirement.~~** The method is sufficiently validated as acceptable data on the stabilities of standards and extracts has been provided.

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Impact on Human and Animal Health

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

Rate and extent of oral absorption/systemic bioavailability

Rapid (plasma radioactivity T_{max} = 1 hr at 1 mg/kg bw). Absorption (sum of radioactivity in urine & tissues excluding faeces after single low dose of 1 mg/kg bw): 100%

Post hepatic systemic bioavailability (toxicokinetics study after single low dose of 1 mg/kg bw): 60%

Toxicokinetics

[pyrazolyl-4-14C] inpyrfluxam

1 mg/kg bw (oral, single dose):

	Male	Female
T_{max} [h]	1	1
C_{max} [µg eq. of S-2399/g]	0.161	0.144
$t_{1/2}$ [h]	13	12
AUC [µg eq. of S-2399.h/g]	1.77	1.63
Bioavailability (%) total RA	*0.2 ± 0.04*	*0.1 ± 0.02*
Bioavailability (%) plasma	-	-

150 mg/kg bw (oral, single dose):

	Male	Female
T_{max} [h]	8	24
C_{max} [µg eq. of S-2399/g]	8.0	7.2
$t_{1/2}$ [h]	14	17
AUC [µg eq. of S-2399.h/g]	270	382

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	<table><tr><td>Bioavailability (%) total RA</td><td>*0.2 ± 0.06*</td><td>*0.1 ± 0.04*</td></tr><tr><td>Bioavailability (%) plasma</td><td><0.3</td><td><0.3</td></tr></table> <u>1 mg/kg bw (oral, repeat dose):</u> <table><tr><td></td><td>Male</td><td>Female</td></tr><tr><td>T_{max} [h]</td><td>1</td><td>2</td></tr><tr><td>C_{max} [µg eq. of S-2399/g]</td><td>0.198</td><td>0.214</td></tr><tr><td>$t_{1/2}$ [h]</td><td>12</td><td>9</td></tr><tr><td>AUC after last administration [µg eq. of S-2399.h/g]</td><td>2.04</td><td>2.10</td></tr><tr><td>Bioavailability (%) total RA</td><td>*0.2 ± 0.02*</td><td>*0.1 ± 0.01*</td></tr><tr><td>Bioavailability (%) plasma</td><td>-</td><td>-</td></tr></table>
Distribution	Inpyrfluxam and/or its metabolites were widely distributed, with higher levels found in blood, plasma, liver, kidney, adrenal and heart.
Potential for bioaccumulation	No evidence for bioaccumulation
Rate and extent of excretion	<u>Single dose study</u> Rapid and extensive (> 90% AD) within 2-3 days, mainly via urine (49.2% – 61% AD) and bile (46.9 – 68.9% AD). <u>Repeated dose study</u>

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	elimination was rapid and was essentially complete, with >90% AD excreted within 24 hours after the end of dosing. Elimination was predominantly via urine (33 – 51.6% AD) and faeces (44.8 – 61.5% AD).
Metabolism in animals	Inpyrfluxam was extensively metabolized, and in addition to the parent, a total of 12 metabolites, including two conjugates, were identified, and quantified in both single and repeat dose studies in rats. 1′-COOH-S-2840 and N-des-Me-1′-COOH-S-2840 were the major metabolites in urine and the glucuronide of 1′-CH2OH-S-2840 was a major metabolite in bile. A metabolic pathway was proposed by the applicant with N-demethylation, oxidation of the 1',1'-dimethylgroup of the indane ring along with the minor metabolic reactions 3'and 7'-hydroxylation of the indane ring.
In vitro metabolism	From the in vitro metabolism studies using rat, human and dog liver microsomes, no unique human metabolite was identified.
Toxicologically relevant compounds (animals and plants)	Inpyrfluxam and its metabolites 1'-CH2OH-S-2840 (free and conjugated) and 3'-OH-S-2840 (free)
Toxicologically relevant compounds (environment)	-

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

Rat LD_{50} oral	**LD50 180 mg/kg**	**Cat 3 (H301)**
Rat LD_{50} dermal	> 2000 mg/kg bw	Not classified
Rat LC_{50} inhalation	4-hr LC50 > 2.61 mg/L analytically determined (maximal attainable concentration)	Not classified
Skin irritation	Not irritating	Not classified
Eye irritation	Not irritating	Not classified
Skin sensitisation	Not sensitising	Not classified
Phototoxicity	~~Not phototoxic~~ Inconclusive	-

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

Target organ / critical effect		**Not classified**
Relevant oral NOAEL	Rat: 31.7 mg/kg bw/day (90-day) Mouse: 111 mg/kg bw/day (90-day) Dog: 6 mg/kg bw/day (1-year)	-
Relevant dermal NOAEL	28-day, rat: 1000 mg/kg bw per day	-
Relevant inhalation NOAEL	No data, not required	-

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

In vitro studies	Ames Test – negative. *In vitro* chromosome aberration assay (CHO cells) - negative; Mammalian cell gene mutation assay (V79 cells) - negative	**Not classified**
In vivo studies	*In vivo* (oral gavage) mouse bone marrow micronucleus test (CD1-mice) – negative with clear evidence of systemic exposure in bone marrow.	Not classified
Photomutagenicity	Not required	-
Potential for genotoxicity	Inpyrfluxam is unlikely to be genotoxic	-

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

Long-term effects (target organ/critical effect)	Liver in rats and mice, kidney, cervical lymph nodes and glandular stomach in mice	**Not classified**
Relevant long-term NOAEL	2-year, rat: 19.4 mg/kg bw/ day	-
Carcinogenicity (target organ, tumour type)	Rat: no treatment-related increase in tumour incidence Mouse: no treatment-related increase in tumour incidence	Not classified
Relevant NOAEL for carcinogenicity	65.8 mg/kg bw/day, highest dose tested (rat)	-

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

Reproduction target / critical effect	**Rat** *Reproductive toxicity* No adverse effects up to the top dose *Parental toxicity* Effects on bw (body weight), bwg (body weight gain), fc (food consumption), liver and thyroid toxicity *Offspring toxicity* Effects on bw	**Not classified**
Relevant parental NOAEL	27.8 mg/kg bw /day	-
Relevant reproductive NOAEL	86 mg/kg bw /day	-
Relevant offspring NOAEL	27.8 mg/kg bw /day	-

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Developmental toxicity

Developmental target / critical effect	**Rat** *Maternal toxicity* ↓ bw and bwg, fc *Developmental toxicity* ↓ foetal weight **Rabbit** *Maternal toxicity* Clinical signs of toxicity (red discharge in the tray and abortions) ↓ bwg, fc *Developmental toxicity* None	**Not classified**
Relevant maternal NOAEL	Rat: 25 mg/kg bw/day	-
Relevant developmental NOAEL	Rat: 25 mg/kg bw/day	-

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

Acute neurotoxicity	**Rat** Systemic toxicity↓ motor activity ↓ body temperature **NOAEL : 30 mg/kg bw** Neurotoxicity None **NOAEL : 200 mg/kg bw, highest dose tested**	**Not classified**
Repeated dose neurotoxicity	**Rat** Systemic toxicity ↓ Bw, fc **NOAEL : 35.2 mg/kg bw** Neurotoxicity None	**Not classified**

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	NOAEL : 133 mg/kg bw, highest dose tested **Dog** Optic nerve fibre degeneration at and above 160 mg/kg bw/day in both 90-day and 1-year study, in the presence of significant systemic toxicity.	
Additional studies (e.g. delayed neurotoxicity, developmental neurotoxicity)	Not required	

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

Supplementary studies on the active substance	Investigative teratogenicity study in rats to demonstrate that the single incidence of cyclopia seen in rats was not related to inpyrfluxam treatment.
Endocrine disrupting properties	For the EAS and T modalities inpyrfluxam is not an endocrine disruptor (ED). The ED potential has been sufficiently investigated.
Studies performed on metabolites or impurities	**Metabolites:** 3'-OH-S-2840 Acute oral toxicity in rats- LD50 > 2000 mg/kg bw 90-day repeat dose study in rats: NOAEL: 500 ppm (32.2 mg/kg bw/day) based on clinical-chemistry findings indicative of liver damage, histopathological findings in the liver and ovary at the LOAEL: 2000 ppm (157 mg/kg bw/day) 1'-COOH-S-2840

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	Acute oral toxicity in rats- LD50 > 2000 mg/kg bw Ames Test – negative. *In vitro* chromosome aberration assay (CHO cells) - negative. Mammalian cell gene mutation assay (V79 cells) – negative In Vitro Micronucleus (TK6 cells)-negative All of the plant and livestock metabolites of inpyrfluxam have been assigned the parent's dietary reference values, because either they are major rat metabolites covered by parent (1'-COOH-S-2840, N-des-Me-1'-COOH-S-2840, 1'-CH2OH-S-2840 glucuronide and 1'-CH2OH-S-2840), or are no more toxic than parent based on experimental data (1'-COOH-S-2840, 3'-OH-S-2840, DFPA, N-des-Me-DFPA and DFPA-CONH2) or a comparative QSAR analysis and read-across approach (Gly-1'-CH2OH-S-2840, 1',1'-bis-(CH2OH)-S-2840, N-des-Me-S-2840, Glc-NDM-S-2399A and Glc-NDM-S-2399B). **Relevant impurities** None

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

	Limited; new active substance. No reports of adverse health effects attributed to exposure associated with the handling, testing or manufacture of inpyrfluxam technical and formulations. No reports of clinical cases and poisoning.

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Summary[2] (assimilated Regulation No 1107/2009, Annex II, point 3.1 and 3.6)

	Value	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.06 mg/kg bw/day	Dog, 1-year	100
Acute Reference Dose (ARfD)	0.3 mg/kg bw	Rat, acute neurotoxicity	100
Acceptable Operator Exposure Level (AOEL)	0.04 mg/kg bw/day	Dog, 1-year	100*
Acute Acceptable Operator Exposure Level (AAOEL)	0.2 mg/kg bw	Rat, acute neurotoxicity	100*

* Including correction for limited oral absorption/bioavailability (60 %).

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

Representative formulation (indicate name, type e.g. EC and concentration of active substance)	Concentrate (59.8 g/L inpyrfluxam): 8.8 % Spray dilution (0.139 g/L inpyrfluxam): 20 % Based on an in vitro study conducted on the representative product, S-2399 60 g/L EC (emulsifiable concentration containing 60 g/L inpyrfluxam)

[2] If available include also reference values for metabolites

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

Operators	Use: Spring and winter cereal crops, vehicle mounted boom sprayer (downward spraying), 0.09 kg a.s./ha **Model: EFSA Calculator (version 30 March 2015, 2014 EFSA exposure guidance)** % of AOEL No PPE (workwear) 64% % of AAOEL No PPE (workwear) 55.5% **Model: EFSA OPEX Model (version 1.1.2, 2022 EFSA exposure guidance)** % of AOEL No PPE (workwear) 85.7% % of AAOEL No PPE (workwear) 72.2%
Workers	Use: Spring and winter cereal crops, 0.09 kg a.s./ha, inspection/irrigation **Model: EFSA Calculator (version 30 March 2015, 2014 EFSA exposure guidance)** % of AOEL Workwear (arms, body and legs covered) 6.3% **Model: EFSA OPEX Model (version 1.1.2, 2022 EFSA exposure guidance)**

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	% of AOEL Workwear (arms, body and legs covered) 6.3% Acute worker exposure assessment not possible.
Bystander and Residents	Use: Spring and winter cereal crops, vehicle mounted boom sprayer (downward spraying), 0.09 kg a.s./ha **Model: EFSA Calculator (version 30 March 2015, 2014 EFSA exposure guidance)** Child resident % of AOEL Spray drift 16.2% Vapour 2.7% Surface deposits 0.8% Re-entry into treated crops 7.6% Sum of all pathways 18.3% Adult resident % of AOEL Spray drift 3.9% Vapour 0.6% Surface deposits 0.3% Re-entry into treated crops 4.2% Sum of all pathways 6.0% Child bystander % of AAOEL Spray drift 7.4% Vapour 0.5% Surface deposits 0.5% Re-entry into treated crops 1.5%

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	Adult bystander	% of AAOEL
	Spray drift	2.0%
	Vapour	0.1%
	Surface deposits	0.2%
	Re-entry into treated crops	0.8%
	Model: EFSA OPEX Model (version 1.1.2, 2022 EFSA exposure guidance)	
	Child resident	% of AOEL
	Spray drift	16.3%
	Vapour	0.03%
	Surface deposits	0.8%
	Re-entry into treated crops	7.6%
	Sum of all pathways	15.6%
	Adult resident	% of AOEL
	Spray drift	3.9%
	Vapour	0.01%
	Surface deposits	0.3%
	Re-entry into treated crops	4.2%
	Sum of all pathways	5.4%
	Child bystander	% of AAOEL
	Spray drift	7.4%
	Vapour	0.007%
	Surface deposits	0.5%
	Re-entry into treated crops	1.5%
	Adult bystander	% of AAOEL
	Spray drift	2.0%
	Vapour	0.002%
	Surface deposits	0.2%
	Re-entry into treated crops	0.8%

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		Inpyrfluxam

Section 2 Mammalian Toxicology

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

Substance	Inpyrfluxam
Mandatory classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process as applicable in GB:	No current mandatory classification
GB Authority proposal[3] for mandatory classification according to Regulation (EC) No 1272/2008 as applicable in GB:	**Acute oral toxicity in category 3 (H301)**

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

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Section 3 Residues

Residues in or on treated products food and feed

Metabolism in plants (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.1, 6.5.1, 6.6.1 and 6.7.1)

	Crop group	Crop(s)	Application(s)	DAT (days)
Primary crops (Plant groups covered) OECD Guideline 501	Fruit crops	Apple	3 x ~ 220 g a.s./ha (phenyl and pyrazolyl) Foliar spray	Fruit, leaves: 14
	Root and tuber crops	Potato	1 x ~ 5.0 g a.s./100 kg seed (phenyl and pyrazolyl) Seed treatment	Foliage: 70 Tubers: 83
	Leafy crops	-	-	-
	Cereals/grass crops	Maize/ Corn	1 x ~ 6.6 g a.s./100 kg seed (phenyl and pyrazolyl) Seed treatment	Forage, kernels + cob: 105 Grain, stover: 126
		Sorghum	1 x ~ 6.3 g a.s./100 kg seed (phenyl and pyrazolyl) Seed treatment	Forage: 83 Grain, stover: 152
		Rice	1 x ~ 100 g a.s./ha (phenyl and pyrazolyl) Foliar spray	Immature plant: 14 Grain, straw, hulls: 28

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			1 x 391 or 357 g a.s./ha (phenyl and pyrazolyl) soil application	Immature plant: 30 Grain, straw, hulls: 132
	Pulses and oilseed crops	Soyabean	2 x ~ 110 g a.s./ha (phenyl and pyrazolyl) Foliar spray	Forage: 20 Hay: 33 Immature pod: 47, 11 Mature seeds, pods: 89, 53
		Rapeseed/Canola	1 x ~ 5.0 g a.s./100 kg seed (phenyl and pyrazolyl) Seed treatment	Seeds: 161
	Miscellaneous	-	-	-
	The major identified component of the residue was parent inpyrfluxam for apple, soyabean and rice (foliar treated) for both radiolabels and for [phenyl-U-^{14}C] treated potato. A consistent pattern of metabolism was observed. The principal biotransformation observed was oxidation of inpyrfluxam forming hydroxylation products 3'-OH-S-2840, 1'-CH_2OH-S-2840 (A and B isomers) and 1'-COOH-S2840 (A and B isomers). In some plants, more extensive metabolism was observed, with further biotransformations and conjugation of residues. The foliar rice study is dosed appropriately with regard to the current GAP.			

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		Inpyrfluxam

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Rotational crops (metabolic pattern) OECD Guideline 502	**Crop group**	**Crop(s)**	**PBI (days)**	**Comments**
	Root/tuber crops	Radish	30, 120, 365	Application of 1 × 235 g as/ha to bare soil (phenyl and pyrazolyl)
	Leafy crops	Lettuce	30, 120, 365	
	Cereals (small grain)	Sorghum	30, 120, 365	
	Other	-	-	-
Rotational crop and primary crop metabolism similar?	Yes – The major identified components of the residue in lettuce, radish tops and radish roots were inpyrfluxam, and then metabolites (either in free or conjugated forms): 1'-CH_2OH-S-2840, 3'-OH-S-2840, 1'-COOH-S-2840, DFPA, *N*-des-Me-DFPA, *N*-des-Me-S-2840, DFPA-$CONH_2$ and *N*-des-Me-1'-CH_2OH-S-2840. Parent inpyrfluxam was found in sorghum matrices but in smaller amounts that the other rotational crops. The major identified components in sorghum matrices were conjugated forms of 1'-CH_2OH-S-2840, *N*-des-Me-1'-CH_2OH-S-2840 and DFPA. Inpyrfluxam is extensively metabolised into a large number of metabolites, many of which formed complex conjugates with indigenous compounds, and became potentially incorporated as ‘bound’ residues in various plant constituents. The active substance underwent a number of transformation processes including oxidation, des-methylation, amide bond cleavage, as well as combinations of these processes. Overall, the metabolic pathways are considered consistent with primary crops. See below - Based on the currently intended uses, residues are not anticipated in rotational crops, even taking account of the potential for year-on-year soil accumulation following use with inpyfluxam.			

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		Inpyrfluxam

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Processed commodities (Standard hydrolysis study) OECD Guideline 507	Conditions	Inpyrfluxam	3'-OH-S-2840	1'-CH_2OH-S-2840	1'-COOH-S-2840A	1'-COOH-S-2840B
	20 min, 90°C, pH 4	100.5 % (% compared to t0)	103% (overall % compared to t0) (3'-OH-S-2840 82.8%, dehydrate 13.0%)‡	102 % (% compared to t0)	101 % (% compared to t0)	103% (% compared to t0)
	60 min, 100°C, pH 5	103.2 % (% compared to t0)	99% (overall % compared to t0) (3'-OH-S-2840 87.6%, dehydrate 9.0%)‡	95 % (% compared to t0)	101 % (% compared to t0)	100% (% compared to t0)
	20 min, 120°C, pH 6	100.7 % (% compared to t0)	98% (overall % compared to t0) (3'-OH-S-2840 96.7%, dehydrate 1.7%)‡	101 % (% compared to t0)	103 % (% compared to t0)	99% (% compared to t0)
Residue pattern in processed	% compared to t0- reflects % Applied Radioactivity at termination compared to time zero					

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		Inpyrfluxam

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commodities similar to residue pattern in raw commodities ?	‡ %TRR levels in brackets are the amount of applied radioactivity recovered normalised to 100% to give the relative contribution of 3'-OH-S-2840 dehydrate. Yes - The effect of processing on the nature of the residues of inpyrfluxam, 3'-OH-S-2840, 1'-CH_2OH-S-2840 and 1'-COOH-S-2840 was determined using the active substance and metabolites radiolabelled at the pyrazolyl ^{14}C position. Inpyrfluxam, 1'-CH_2OH-S-2840 and 1'-COOH-S-2840 were found to be stable under the simulation conditions of pasteurisation, baking, brewing and boiling and sterilisation. No degradation products were formed. Under the simulated conditions of pasteurisation (20 min, 90°C, pH 4), baking brewing and boiling (60 min, 100°C, pH 5) degradation of 3'-OH-S-2840 was observed to form 3'-OH-S-2840 dehydrate and a small number of other minor unidentified degradation products. Under the condition of sterilisation (20 min, 120°C, pH 6), no significant degradation was observed, and the metabolite can be considered hydrolytically stable. Under pasteurisation 3'-OH-S-2840 dehydrate was a major component at 13 %TRR. It was <10%TRR under the other processes. This degradate seems to form under more acidic conditions. Overall, the residue pattern is expected to be similar to that in raw commodities. At the current time, as residues of 3'-OH-S-2840 are present only in low amounts in cereal grain (<0.01 mg/kg in wheat grain and up to 0.02 mg/kg in barley grain) any low level of 3'-OH-S-2840 dehydrate that might form would be insignificant. If for future uses, residues of 3'-OH-S-2840 are found in other RAC commodities (intended for processing) at higher concentrations then it might be necessary to analyse residues of 3'-OH-S-2840 dehydrate in MOR processing trials, as well as the other components of the proposed RD-RA. If 3'-OH-S-2840 dehydrate were to be found, it might be necessary to consider the consumer exposure to this component further (currently there is no toxicological information on this degradate).

Plant residue definition for enforcement (RD-Enf) OECD Guidance, series on pesticides No 31	Inpyrfluxam

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Plant residue definition for risk assessment (RD-RA)	Sum of inpyrfluxam and its metabolites 1'-CH_2OH-S-2840 (A and B isomers, free and conjugate) and 3'-OH-S-2840, expressed as inpyrfluxam (HSE advises that future crop trials should analyse the following to reconfirm (or to reconsider if needed) the proposed universal residue definition for plants: at least for *N*-des-Me-DFPA (free and conjugated)* for members of the oilseeds and pulses metabolism grouping, including legumes; and at least for N-des-Me-S-2840 for members of the oilseeds and pulses metabolism grouping, including legumes; and at least for 1'-COOH-S-2840 (free and conjugated) for members of the root and tuber vegetables metabolism grouping, including potatoes and bulb vegetables.. *It might also be advisable to include *N*-des-Me-DFPA in trials set up for members of the root and tuber vegetables metabolism grouping, including potatoes and bulb vegetables, although 1'-COOH-S-2840 (free and conjugated) might be an adequate marker to determine whether residues are found/not found in root, tuber and bulb vegetable crops, including potatoes). ~~(HSE advises that future crop trials should analyse at least for *N*-des-Me-DFPA* in oilseeds and pulses and for 1'-COOH-S-2840 (free and conjugated) in root and tuber vegetables, including potatoes to reconfirm the proposed universal residue definition for plants).~~ ~~*It might also be advisable to include *N*-des-Me-DFPA in trials set up on root and~~

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	~~tuber vegetables, including potatoes, although 1'-COOH-S-2840 (free and conjugated) might be an adequate marker to determine whether residues are found/not found in root and tuber crops, including potatoes.~~ Molecular weight conversion to express 1'-CH_2OH-S-2840 as inpyrfluxam equivalence is 0.95 Molecular weight conversion to express 3'-OH-S-2840 as inpyrfluxam equivalence is 0.95
Conversion factor (enforcement to risk assessment)	Barley grain: 1.9 The CF for barley could be considered suitable for other cereal grains.

Metabolism in livestock (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.2, 6.2.3, 6.2.4, 6.2.5 6.7.1)

	Animal	Dose (mg/kg bw/d)	Duration (days)	N rate / comment
Animals covered OECD Guideline 503 and SANCO/11187/2013 rev. 3 (fish)	Laying hen	0.86 (12.44 mg a.s/kg feed per day (pyrazolyl)) 0.83 (13.13 mg a.s/kg feed per day (phenyl))	7	25N (pyrazolyl) 24N (phenyl)
	Goat	0.51	5	4N (Pyrazolyl) 5N (Phenyl)

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		(13.74 mg/kg feed per day (pyrazolyl)) 0.64 (15.74 mg/kg feed per day (phenyl))		
	Pig	-	-	-
	Fish	-	-	-
	Both pyrazolyl- and phenyl- labelled Inpyrfluxam was investigated for laying hen and goat.			

Time needed to reach a plateau concentration in milk and eggs (days)	Based on the current expected exposure, it is not possible to determine the time needed to reach a plateau concentration in milk and eggs
Animal residue definition for enforcement (RD-Enf) OECD Guidance, series on pesticides No 31	Inpyrfluxam This definition is proposed for the intended uses on cereals considered in this assessment. Increases in the livestock dietary burden may require the RD-Enf and RD-RA for livestock to be reconsidered.
Animal residue definition for risk assessment (RD-Enf)	A residue definition for dietary risk assessment for inpyrfluxam in livestock products is not proposed at this time. See comment for the RD-Enf
Conversion factor (enforcement to risk assessment)	-
Metabolism in rat and ruminant similar (Yes/No)	Yes

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Fat soluble residues (Yes/No) (FAO, 2009)	No Log P_{ow} for inpyrfluxam = 3.65 at 25 ºC (indicating possible potential to be fat-soluble). In the feeding studies, residues were generally <LOQ, not allowing estimation of ratios between fatty and non-fatty tissues. Overall it is considered that inpyrfluxam is not fat-soluble. Increases in the livestock dietary burden may require reconsideration of fat solubility.

Nature of residues in Honey

Honey residue definition for enforcement (RD-Enf)	Inpyrfluxam
Honey residue definition for risk assessment (RD-RA)	RD-RA for honey is not proposed at this time
Conversion factor (enforcement to risk assessment)	-

Residues in succeeding crops (Regulation (EU) N° 283/2013, Annex Part A, point 6.6.2)

Confined rotational crop study (Quantitative aspect) OECD Guideline 502	Following application of inpyfluxam to bare soil at 235 g a.s/ha, inpyrfluxam, 1'-CH_2OH-S-2840, 3'-OH-S-2840, 1'-COOH-S-2840, DFPA, *N*-des-Me-DFPA, *N*-des-Me-S-2840, DFPA-$CONH_2$ and *N*-des-Me-1'-CH_2OH-S-2840 were major components found in lettuce, radish tops and radish roots. Major identified components in sorghum matrices were 1'-CH_2OH-S-2840, *N*-des-Me-1'-CH_2OH-S-2840 and DFPA. Total radioactive residue levels were up to 0.1 mg/kg in lettuce/radish roots, up to 0.37

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	mg/kg in radish tops, and up to 0.05814, 0.21, and 1.07 mg/kg in sorghum grain, forage and stover respectively. The rotational crop studies were conducted at around 1.7N compared to the A_{total} for the current GAP. This was calculated as a parent inpyrfluxam equivalent application rate to account for the highest anticipated soil exposure rates of inpyrfluxam, 3'-OH-S-2840 and 1'-COOH-S-2840 (as these are all ~~very~~ persistent and can accumulate in soil), taking account of the potential for soil accumulation from year-on-year use. The highest A_{total} based on the current use is for parent inpyrfluxam, 141.7 g a.s./ha. Generally, there was a considerable decrease in the TRR values between the levels in the ~~first and~~ second and third rotations. ~~and this decreased further in the third rotation.~~
Field rotational crop study OECD Guideline 504	Application of 240 g a.s/ha was made to a primary cereal crop which was destroyed and incorporated into the soil to simulate crop failure. The plant back intervals studied were 30, 120 and 365 days and the rotational crops planted were lettuce, carrot, barley and wheat. Samples were analysed for parent and the major metabolites identified in the rotational metabolism study. Parent inpyrfluxam was not found in any samples at any plant-back intervals (PBIs). Metabolite residues in rotational crops were very low, with only the 30 day PBI for spring wheat straw demonstrating any residues above LOQ (0.01 mg/kg) in mature crop samples. These were DFPA at 0.09 - 0.1 mg/kg, 1'-CH_2OH-S-2840 (sum of isomers) at 0.023 mg/kg, 1'-COOH-S-2840 (sum of

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	isomers) at 0.017 – 0.019 mg/kg, *N*-des-Me-1'CH_2OH-S-2840 (sum of isomers) at 0.019 mg/kg and 3'-OH-S-2840 at 0.01 mg/kg. Considering the 1.7N application rate of the confined studies, no residues >0.01 mg/kg are expected in food items. At 1N, the only residues expected to be > 0.05 mg/kg in feed items is DFPA in wheat straw at an estimated level of 0.053 – 0.059 mg/kg (following scaling). Given that it is concluded that DFPA is of a significantly lower toxicity compared to parent inpyrfluxam and that DFPA is therefore not proposed for inclusion in the primary crop RD-RA despite it being found in primary crop cereal straw samples at up to 0.22 mg/kg (expressed as DFPA, following scaling to the GAP rate), the level of the rotational crop findings of DFPA in straw will not result in significant residues in the diets of livestock. It is noted that for future uses with higher application rates, the potential A_{total} may need to be refined upwards which could result in potential residues expected in rotational crops. It is not considered necessary at this time to set MRLs above the LOQ for rotational crops, and a separate RD-RA for rotational crops is not required at this time If a higher soil exposure is expected for a future GAP leading to residues being found in rotational crops, the RD-RA for rotational crops should be considered further.

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Stability of residues (Regulation (EU) N° 283/2013, Annex Part A, point 6.1)

OECD Guideline 506

Plant product (category)	Commodity	T (°C)	Stability (Months)		
			Inpyrfluxam	3'-OH-S-2840	1'-CH_2OH-S-2840
High water content	Cucumber	-18	22	22	22
High oil content	Soyabean seed	-18	22	22	22
High protein content	Field bean	-18	22	22	22
High starch content	Wheat grain	-18	22	22	22
High acid content	Grape	-18	22	22	22

Inpyrfluxam, 3'-OH-S-2840 and 1'-CH_2OH-S-2840 are considered to be stable in all crop commodity groups for at least 22 months.

As the data covers all 5 crop categories, the stability in raw fractions can be extrapolated to processed commodities. Further specific storage stability data were made available for a number of processed fractions and these are further explained in Vol 1 and specifically detailed in the Vol 3 B.7.1. These are regarded as supportive to the above summarised data as no instability was observed in the studies; stability in processed fractions is supported for 22 months.

The storage stability of the metabolites 1'-COOH-S-2840, DFPA-$CONH_2$ and *N*-des-Me-DFPA were also evaluated and they can be considered stable in high water, high acid, high oil, high starch and high protein matrices for at least 22 months.

The storage stability of the metabolites *N*-des-Me-S-2840 and *N*-des-Me-1'-CH_2OH-S-2840 were evaluated and they can be considered stable in high water, high acid, high oil, high starch and high protein matrices for at least 12 months.

All the current MOR (magnitude of residues) trials in primary crops, rotational crops and for processed commodities are suitably covered by acceptable data provided on storage

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stability of residues in frozen plant samples and an understanding of the stability of residues in extracts.

Animal	Animal Commodity	T (°C)	Stability (Days)		
			Inpyrfluxam	1'-COOH-S-2840	1'-CH_2OH-S-2840
Poultry Ruminant	Muscle	<0	40 29	40 29	40 29
Poultry Ruminant	Liver	<0	40 29	40 29	40 29
Ruminant	Kidney	<0	29	29	29
Ruminant	Milk	<0	75	75	75
Poultry	Egg	<0	90	90	90
Poultry Ruminant	Fat	<0	49 31	49 31	49 31

Storage stability was studied concurrently with the feeding studies. All storage periods of the frozen samples accommodates the periods that the samples were stored in the supporting feeding studies.

Inpyrfluxam, 1'-COOH-S-2840 and 1'-CH_2OH-S-2840 are considered stable in the matrices above for at least the time periods studied for, when stored frozen (<0°C).

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		Inpyrfluxam

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Summary of residues data from the supervised residue trials (Regulation (EU) N° 283/2013, Annex Part A, point 6.3)

OECD Guideline 509, OECD Guidance, series on pesticides No 66 and OECD MRL calculator

Commodity	Outdoor / Indoor (a)	Residue levels (mg/kg) observed in the supervised residue trials representative for the intended GAPs (b)	Recommendations/comments (OECD calculations)	MRL proposals (mg/kg)	HR (mg/kg) (c)	STMR (mg/kg) (d)
RD-RA: Sum of inpyrfluxam and its metabolites 1'-CH_2OH-S-2840 (A and B isomers, free and conjugate) and 3'-OH-S-2840, expressed as inpyrfluxam **RD-Enf:** Inpyrfluxam						
Representative uses						
Wheat	Outdoor	Grain RD_{Enf}: 10 x <0.01, 3 x 0.01, 0.019, 0.020 RD_{RA}: 0.012, 6 x 0.013, 0.014, 0.019 2 x 0.029, 0.030, 0.034, 0.037, 0.038	All trials have been scaled to the representative GAP (90 g a.s./ha)	0.03 (OECD calculator _ rounded)	RD_{Enf}: 0.020 RD_{RA}: 0.038	RD_{Enf}: 0.010 RD_{RA}: 0.014

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				(0.025 unrounded value)		
		Straw RD_{Enf}: 0.026, 0.076, 0.086, 0.087, 0.11, 0.17, 0.22, 0.23, 0.25, 0.93, 1.00, 1.41, 2.27, 2.75, 2.94 RD_{RA}: 0.15, 0.16, 0.20, 0.23, 0.24, 0.33, 0.45, 0.64, 0.94, 1.22, 2 x 1.74, 2.73, 3.19, 3.67	All trials have been scaled to the representative GAP (90 g a.s./ha)	MRLs not currently set for animal feed items	RD_{Enf}: 2.94 RD_{RA}: 3.67	RD_{Enf}: 0.23 RD_{RA}: 0.64
Barley	Outdoor	Grain RD_{Enf}: 3 x <0.01, 2 x 0.01, 0.013, 0.019, 0.026, 0.030, 0.051, 0.055, 0.058, 0.11, 0.20 RD_{RA}: 2 x 0.028, 0.039, 0.042, 0.071, 0.085, 0.087, 0.088, 0.094, 0.11, 0.12, 0.13, 0.22, 0.30	All trials have been scaled to the representative GAP (90 g a.s./ha)	0.3 (OECD calculator – rounded) (0.257 unrounded value)	RD_{Enf}: 0.20 RD_{RA}: 0.30	RD_{Enf}: 0.023 RD_{RA}: 0.088

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		Straw RD_{Enf}: 0.062, 0.079, 0.086, 0.090, 0.10, 0.17, 2 x 0.21, 0.27, 0.28, 0.29, 0.34, 1.73, 3.13 RD_{RA}: 0.12, 0.14, 0.24, 0.28, 2 x 0.37, 0.39, 0.44, 0.51, 0.55, 0.59, 0.68, 2.40, 4.36	All trials have been scaled to the representative GAP (90 g a.s./ha)	MRLs not currently set for animal feed items	RD_{Enf}: 3.13 RD_{RA}: 4.36	RD_{Enf}: 0.21 RD_{RA}: 0.415

(a):Residues trials data relevant to the agricultural practices and climatic conditions in the UK, Indoor for glasshouse/protected crops. Country for an import tolerance.

(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 Enforcement and Risk Assessment.

(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: $STMR_{Enf}$)

List of end points

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Inputs for animal dietary burden calculations

Feed commodity	Median dietary burden		Maximum dietary burden	
	Input (mg/kg)	Comment	Input (mg/kg)	Comment
RD-RA: Sum of inpyrfluxam and its metabolites 1'-CH_2OH-S-2840 (A and B isomers, free and conjugate) and 3'-OH-S-2840, expressed as inpyrfluxam				
Representative uses				
Barley straw	0.415	STMR	4.36	HR
Wheat straw	0.64	STMR	3.67	HR
Triticale straw	0.64	STMR	3.67	HR
Barley grain	0.088	STMR	0.088	STMR – The proposed uses are not post-harvest uses.
Wheat grain	0.014	STMR	0.014	STMR – The proposed uses are not post-harvest uses.
Triticale grain	0.014	STMR	0.014	STMR – The proposed uses are not post-harvest uses.
Brewer's grain (dried)	0.061	STMR (barley grain) x calculated PF (0.69)	0.061	STMR (barley grain) x calculated PF (0.69)
Distiller's grain (dried)	0.046	STMR (wheat grain) x default PF (3.3)	0.046	STMR (wheat grain) x default PF (3.3)
Wheat gluten meal	0.004	STMR (wheat grain) x calculated PF (0.28)	0.004	STMR (wheat grain) x calculated PF (0.28)

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Wheat milled by-products	0.014	STMR (wheat grain) x calculated PF (0.97)	0.014	STMR (wheat grain) x calculated PF (0.97)

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Section 3 Residues

Residues from livestock feeding studies (Regulation (EU) N° 283/2013, Annex Part A, points 6.4.1, 6.4.2, 6.4.3 and 6.4.4)

OECD Guideline 505 and OECD Guidance, series on pesticides No 73

MRL Calculations

MRL Calculations	Ruminant				Pig / Swine		Poultry		Fish	
Highest expected intake **(mg/kg bw/d)** (mg/kg DM for fish)	Beef cattle	0.037	Ram / Ewe	0.099	Breeding	0.002	Broiler	0.005	Carp	-
	Dairy cattle	0.058	Lamb	0.127	Finishing	0.003	Layer	0.035	Trout	-
							Turkey	0.004	Fish intake >0.1 mg/kg DM	
Intake >0.004 mg/kg bw	Yes		Yes		No		Yes		No	
Feeding study submitted	Yes		No		No		Yes		No	

List of end points

Competent Authority	Month and year	Active Substance (Name)
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Section 3 Residues

Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and N rates	Level 0.07	Beef: 1.9 N Dairy: 1.2 N	Level 0.2	Lamb: 1.6 N Ewe: 2 N	Level 0.07	Breed: 33.7 N Finish: 25.9 N	Level 0.063	B or T: 11.7 N Layer: 1.8 N	Level -	N rate Carp / Trout
	Estimated HR[(a)] at 1N	**MRL** proposals	Estimated HR[(a)] at 1N	**MRL** proposals	Estimated HR[(a)] at 1N	**MRL** proposals	Estimated HR[(a)] at 1N	**MRL** proposals	Estimated HR[(a)] at 1N	**MRL** proposals
Muscle	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	-	-
Fat	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	-	-
Meat[(b)]	<0.01		<0.01		<0.01		<0.01			
Liver	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*		

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Kidney	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*	<0.01	0.01*		
Milk[(a)]	<0.01	0.01*	<0.01	0.01*						
Eggs							<0.01	0.01*		
Method of calculation[(c)]	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf

(a): Estimated HR calculated at 1N level **(estimated mean level for milk).**

(b): HR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

(c): The OECD guidance document on residues in livestock (series on pesticides 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

STMR Calculations

STMR Calculations	Ruminant				Pig / Swine		Poultry		Fish	
Median expected intake **(mg/kg bw/d)** (mg/kg DM for fish)	Beef cattle	0.0053	Ram / Ewe	0.0115	Breeding	0.002	Broiler	0.005	Carp	-
	Dairy cattle	0.0075	Lamb	0.0149	Finishing	0.003	Layer	0.011	Trout	-
							Turkey	0.004		
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and N rates	Level 0.07	Beef: 1.9 N Dairy: 1.2 N	Level 0.2	Lamb: 1.6 N Ewe: 2 N	Level 0.07	Breed: 33.7 N Finish: 25.9 N	Level 0.063	B or T: 11.7 N Layer: 1.8 N	Level -	N rate Carp / Trout
	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Muscle	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fat	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Meat[(b)]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Liver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Kidney	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Milk[(a)]	<0.01	<0.01	<0.01	<0.01						
Eggs							<0.01	<0.01		
Method of calculation[(c)]	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf

List of end points

Competent Authority	Month and year	Active Substance (Name)
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Section 3 Residues

(a): STMR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

(b): When the mean level is set at the LOQ, the STMR is set at the LOQ.

(c): The OECD guidance document on residues in livestock (series on pesticide 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Conversion Factors (CF) for enforcement to risk assessment

Plant Products

Median Conversion Factors (CF) calculated at the different PHIs in the supervised residues trials[a]

OECD Guidance, series on Pesticides No 66

PHI[b] (days)	35	**Comments**
Representative uses		
Wheat grain	-	Residues of parent compound and/or metabolites <LOQ in all trials.
Wheat straw	-	Conversion factors are not required for feed items where MRLs are not set.
Barley grain	1.9	Median from 5 NEU trials.
Barley straw	-	Conversion factors are not required for feed items where MRLs are not set.

Comments: Barley grain conversion factor calculated from trials where residues of the parent compound and its metabolites in accordance with the residue definition for risk assessment were all >LOQ (0.01 mg/kg).

The CF for barley could be considered suitable for other cereal grains.

A CF for barley is only available at PHI 35 as this was the only time period when grain was sampled. This is considered relevant to the currently proposed uses on barley and wheat.

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Processing factors (Regulation (EU) N° 283/2013, Annex Part A, points 6.5.2 and 6.5.3)

OECD Guideline 508 and OECD Guidance, series on testing and assessment No 96

Crop / processed fraction	Number of trials (a)	Processing factor (Pf) MRL (RD-Enf)(b)		Processing factor (pf) Risk assesment (RD-RA)(b)	
		Individual values	Median Pf	Individual values	Median Pf
Representative uses					
Wheat/Aspirated grain	2	7.00, 1.74	4.37	6.62, 1.73	4.18
Wheat/Bran	2	3.82, 4.81	4.32	3.67, 4.73	4.20
Wheat/Middlings	2	2.09, 1.48	1.79	2.14, 1.44	1.79
Wheat/Short	2	4.09, 2.67	3.38	4.03, 2.88	3.46
Wheat/Flour	2	0.18, 0.19	0.18	0.17, 0.20	0.18
Wheat/Whole meal flour	2	0.73, 1.00	0.86	0.75, 0.96	0.86
Wheat/Wholegrain bread	2	0.64, 0.59	0.61	0.61, 0.59	0.60
Wheat/Germ	2	0.73, 0.44	0.59	0.64, 0.44	0.54
Wheat/Milled bypdts	2	0.91, 1.04	0.97	0.94, 1.00	0.97
Wheat/Starch	2	<0.09, <0.04	<0.06	<0.12, 0.08	<0.10

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Wheat/Gluten	2	0.18, 0.56	0.37	0.42, 0.50	0.46
Wheat/Gluten feed meal	2	0.18, 0.44	0.31	0.16, 0.39	0.28
Barley/Grain, stored	2	0.88, 0.65	0.76	0.88, 0.78	0.83
Barley/Malt sprouts	2	0.67, 0.53	0.60	0.74, 0.80	0.77
Barley/Brewer's malt	2	0.67, 0.35	0.51	0.74, 0.51	0.63
Barley/Brewer's grain (fresh)	2	0.52, 0.35	0.44	0.29, 0.18	0.23
Barley/Brewer's grain (dried)	2	1.45, 0.71	1.08	0.94, 0.43	0.69
Barley/Flocs (hops draff)	2	0.74, 0.35	0.55	0.51, 0.29	0.40
Barley/Brewer's yeast	2	0.19, 0.18	0.18	0.17, 0.16	0.17
Barley/Beer	2	0.02, 0.06	0.04	0.08, 0.09	0.08
Barley/Grain, stored 2	2	1.05, 0.82	0.94	0.95, 0.87	0.91
Barley/Pearled (pot)	2	0.17, 0.18	0.17	0.16, 0.21	0.18
Barley/Bran	2	7.14, 4.76	5.95	6.25, 4.30	5.28
Barley/Flour	2	5.95, 3.76	4.86	4.61, 3.28	3.94

(a): Studies with residues in the RAC at or close to the LOQ should be disregarded (unless concentration)

List of end points

Competent Authority	Month and year	Active Substance (Name)
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Section 3 Residues

(b): RD-Enf: Inpyrfluxam, RD-RA: Sum of Inpyrfluxam and its metabolites 1'-CH_2OH-S-2840 (A and B isomers, free and conjugate) and 3'-OH-S-2840, expressed as Inpyrfluxam.

Consumer risk assessment (Regulation (EU) N° 283/2013, Annex Part A, point 6.9) Including all uses (representative uses and uses related to an MRL application)

ADI	0.06 mg/kg bw per day
NEDI (% ADI), according to UK model	Highest UK NEDI: 2% ADI (Infants) *
IEDI (% ADI), according to EFSA PRIMo	Highest IEDI: 1% ADI (NL toddler)
NTMDI (% ADI), according to UK model	Highest UK NTMDI: 3% ADI (Infants)
TMDI (% ADI), according to EFSA PRIMo	Highest TMDI: 2% ADI (NL toddler)
Factors included in the calculations	-
ARfD	0.3 mg/kg bw
NESTI (% ARfD), according to UK model	Highest UK NESTI: 0.4% ADI (Infants/Milk)
IESTI (% ARfD), according to EFSA PRIMo	Highest PRIMo IESTI: 0.4% ARfD (Children/Milk)
Factors included in IESTI and NESTI	-

*A metabolite in groundwater required further consideration, 1'-COOH-S-2840. In drinking water this metabolite contributes up to only 0.7 % of the ADI (the ADI for parent inpyrfluxam can be used to cover the risk assessment of 1'-COOH-S-2840). Therefore, taking account of food and water exposures, no effects on health are expected as dietary intakes are low.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 3 Residues

Proposed MRLs (Regulation (EU) No 283/2013, Annex Part A, points 6.7.2 and 6.7.3)

Product Code	Product	New or amended GB MRL (mg/kg)	Comment
Enforcement residue definition for products of plant origin: Inpyrfluxam			
Representative uses			
0500010	Barley grain	0.3	
0500090	Wheat grain	0.03	
Enforcement residue definition for products of animal origin: Inpyrfluxam			
1011000	Swine	0.01*	
1012000	Bovine	0.01*	
1013000	Sheep	0.01*	
1014000	Goat	0.01*	
1015000	Equine	0.01*	
1017000	Other farmed terrestrial animals	0.01*	
1020000	Milk	0.01*	
1016000	Poultry matrices	0.01*	
1030000	Birds eggs	0.01*	
1040000	Honey and other apiculture products	0.05*	

*Indicates that the MRL is set at the limit of quantification/determination

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Environment fate and behaviour

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

Mineralisation	0.3-0.8 % after 120-182 d, [^{14}C- pyrazolyl]-label (n = 4) 0.7 % after 182 d, [^{14}C- phenyl]-label (n= 1)
Non-extractable residues	9.1-12.2 % after 120-182 d, [^{14}C- pyrazolyl]-label (n= 4) 8.9 % after 182 d, [^{14}C- phenyl]-label (n= 1)
Metabolites requiring further consideration **- name and/or code, % of applied (range and maximum)**	1'-COOH-S-2840 (mixture of 2 diastereomers, all values are 1'-COOH-S-A and 1'-COOH-S-2840B combined) maximum 30.1 % at 120 d (n= 4); [^{14}C- pyrazolyl] & [^{14}C- phenyl] labels 3'-OH-S-2840 maximum 20.7 % (n= 4) [^{14}C- pyrazolyl] & [^{14}C- phenyl] labels

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

Mineralisation	0.1 – 0.4 % after 125-127 d, [^{14}C-pyrazolyl]-label (n= 4)
Non-extractable residues	1.2-7.7% after 125-127 d, [^{14}C- pyrazolyl]-label (n= 4) 6.7 % after 127d, [^{14}C- phenyl]-label (n= 1)
Metabolites requiring further consideration - name and/or code, % of applied (range and maximum)	1'-COOH-S-2840 (mixture of 2 diastereomers, all values are 1'-COOH-S-2840A and 1'-COOH-S-2840B combined):

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Section 4 Environmental fate and behaviour

	6.0-23.4 % at 125-127 d (n= 4); maximum 23.4 %, [^{14}C- pyrazolyl] 11.2 % at 28 d (aerobic onset) (n = 1); ^{14}C-phenyl] label 3'-OH-S-2840: 5.4-9.1 % at 125-127 d (n= 4); maximum 9.4 %, [^{14}C- pyrazolyl] label 7.4 % at 127 d (n = 1); maximum 9.4 %, [^{14}C- phenyl] label

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

Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	3'-OH-S-2840 - 7.7-8.3 % at 12-13 d (n= 1 per radiolabel) [^{14}C-pyrazolyl] & [^{14}C-phenyl] labels
Mineralisation at study end	0.2 % after 13 d, [^{14}C- pyrazolyl]-label (n= 1) 0.5 % after 12 d, [^{14}C- phenyl]-label (n= 1)
Non-extractable residues at study end	1.9 % after 13 d, [^{14}C- pyrazolyl]-label (n= 1) 2.0 % after 12 d, [^{14}C- phenyl]-label (n= 1)

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Section 4 Environmental fate and behaviour

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

LABORATORY TRIGGERING ENDPOINTS AND MODELLING ENDPOINTS								
Parent	**Dark aerobic conditions**							
Soil Type	**pH (H_2O)**	**pH ($CaCl_2$)[b]**	**t. °C [a]**	**% MWHC [a]**	**DT_{50} (d)**	**DT_{90} (d)**	**St. (χ^2)**	**Method of calculation**
Atwater (sandy loam)	7.5	7.0	20	pF2	121	402	1.14	SFO
Newhaven (silt loam)	5.7	5.1	20	pF2	69.7 (Pseudo DT_{50} = 1000 d)	>1000	0.662	DFOP (k_2 fixed 1000d)
Penn (loam)	6.8	6.3	20	pF2	254 (Pseudo DT_{50} = 1000 d)	>1000	1.02	DFOP (k_2 fixed 1000d)
Woodside (loam)	7.5	7.0	20	pF2	86.1 (Pseudo DT_{50} = 1000 d)	>1000	0.680	DFOP (k_2 fixed 1000d, 3'-OH-S-2840 M0 fixed to 1.9% AR)
Maximum (non-normalised [a])					**254**	**>1000**		
pH dependence					No			

a) Normalisation not required; studies conducted at 20 ºC and pF >2

b) Not given, calculated using the equation in the EFSA PEC_{soil} guidance (2017)

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		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

LABORATORY TRIGGERING ENDPOINTS AND MODELLING ENDPOINTS									
1'-COOH-S-2840 (A and B combined)	Dark aerobic conditions; parent dosed study and metabolite dosed study (n = 6); longest normalised DT_{50} and DT_{90}								
Soil Type	**pH (H_2O)**	**pH ($CaCl_2$)**	**t. °C[a)]**	**% MWHC[a)]**	**DT_{50} (d)**	**DT_{90} (d)**	**St. (χ^2)**	**f.f.**	**Method of calculation**
Newhaven (silt loam) – parent applied	5.7	5.1	20	pF2	207	689	5.18	0.535	DFOP(k_2 fixed)-SFO
Woodside (loam) – parent applied	7.5	7.0	20	pF2	840	>1000	2.65	0.612	DFOP(k_2 fixed)-SFO
Speyer 5M (sandy loam) – metabolite applied	8.3	7.3	20	pF2	91.3	303	3.56	Not derived	SFO
Newhaven (silt loam) – metabolite applied	6.2	5.5	20	pF2	24.5	623	3.39	Not derived	DFOP[c)]
Atwater (loamy sand) – metabolite applied	7.1	6.3	20	pF2	148	491	2.59	Not derived	SFO
Maximum (non-normalised [a])					840	>1000		0.612[b]	

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

pH dependence	No

a) Normalisation not required; studies conducted at 20 ºC and pF 2

b) Maximum from parent applied studies

c) DT_{90} not reached in study and so modelling endpoint calculated using DFOP k2, giving a modelling endpoint of 266 d (k2 = 0.002606)

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

LABORATORY TRIGGERING ENDPOINTS AND MODELLING ENDPOINTS									
3'-OH-S-2840	**Dark aerobic conditions; metabolite dosed study (n = 3); trigger endpoints, longest normalised DT_{50} and DT_{90}**								
Soil Type	**pH (H_2O)**	**pH ($CaCl_2$)**	**t. ºC [a]**	**% MWHC [a]**	**DT_{50} (d)**	**DT_{90} (d)**	**St. (χ^2)**	**f.f.**	**Method of calculation**
Speyer 5M (sandy loam) – metabolite applied	8.3	7.3	20	pF2	369	>1000	2.50	1	SFO
Newhaven (silt loam) – metabolite applied	6.2	5.5	20	pF2	303	>1000	3.05	1	SFO
Atwater (loamy sand) – metabolite applied	7.1	6.3	20	pF2	276	917	0.863	1	SFO
Maximum (non-normalised [a])					369	>1000			
pH dependence					No				

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Section 4 Environmental fate and behaviour

a) Normalisation not required; studies conducted at 20 ºC and pF 2

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

FIELD TRIGGER/PERSISTENCE ENDPOINTS								
Parent	**Aerobic conditions; longest non-normalised DT_{50}**							
Soil Type (indicate if bare or cropped soil was used)	**Location** (country or USA state)	**pH $CaCl_2$** [a]	**pH H_2O**	**Depth (cm)** [b]	**DT_{50} (d)**	**DT_{90} (d)**	**St. (χ^2)**	**Method of calculation**
Sandy clay loam, bare soil	Germany	6.0	6.5	0-30	117	388	19	SFO
Clay/silty clay, bare soil	Czech Republic	7.4	7.9	0-40	322	1069	16.1	SFO
Sandy loam, bare soil	Italy	7.5	8.1	0-30	383	1272	15.2	SFO
Loam, bare soil	Spain	4.4	5.0	0-30	47.3	753	5.78	DFOP
Sandy loam, bare soil	Ontario	4.8 [c]	5.4	0-15	10.9	543	7.85	DFOP
Maximum (non-normalised)					383	1272		
pH dependence					No			

a) pH values are mean values for the soil across the depths at which residues were detected.

b) Residue depth refers to the depths at which residues were detected plus the following soil layer.

c) pH (H_2O) converted to pH ($CaCl_2$) using conversion given in the EFSA PECsoil guidance (2017).

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Section 4 Environmental fate and behaviour

FIELD NORMALISED MODELLING ENDPOINTS								
Parent	**Aerobic conditions; geometric mean (n =5)**							
Soil Type	**Location**	**pH $CaCl_2$[a]**	**pH H_2O[b]**	**Depth (cm)[c]**	**DT_{50} (d) Norm.**	**DT_{90} (d) Norm.**	**St. (X^2)**	**Method of calculation**
Sandy clay loam, bare soil	Germany	6.0	6.5	0-30	78.8	262	16.7	SFO
Clay/silty clay, bare soil	Czech Republic	7.4	7.9	0-40	169	561	14.8	SFO
Sandy loam, bare soil	Italy	7.5	8.1	0-30	421	1400	14.9	SFO
Loam, bare soil	Spain	4.4	5.0	0-30	38 (overall) 3.51 (fast phase) 111 (slow phase) g value 0.37	295	7.54	DFOP
Sandy loam, bare soil	Canada (Ontario)	4.8 [b]	5.4	0-15	104	344	19.5	SFO
pH dependence					No			

a) pH values are mean values for the soil across the depths at which residues were detected.
b) pH (H_2O) converted to pH ($CaCl_2$) using conversion given in the EFSA PECsoil guidance (2017)
c) Residue depth refers to the depths at which residues were detected plus the following soil layer.

List of end points

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Section 4 Environmental fate and behaviour

Selection of laboratory and field data for modelling endpoint determination

Following the EFSA guidance (EFSA Journal 2014;12(5):3662), due to a geomean laboratory $DegT_{50}$ value ≥ 240 days for inpyrfluxam, (see Annex Part A, point 7.1.2.1.1), and ≥ 4 field studies being provided, the geomean of the field studies was used to determine the final $DegT_{50}$ value. This selection criteria also applied to the metabolite 3'-OH-S-2840 (see Annex Part A, point 7.1.2.1.2).

For metabolite 1'-COOH-S-2840, the geomean Laboratory $DegT_{50}$ value is < 240 days, and so the null hypothesis that the lab and field studies give statistically indistinguishable endpoints was tested. The test rejected the null hypothesis (Student's t-test, t = 1.54, α = 0.25), and showed that field studies produced shorter $DegT_{50}$ values than laboratory studies. As ≥ 3 field $DegT_{50}$ values were present for this metabolite, these were used to determine the modelling endpoint.

Selection of kinetic model for modelling endpoint determination

As the modelling endpoint determination of inpyrfluxam involved the combination of SFO and DFOP models, the overall average behaviour was also described by a DFOP model. To reduce complexity in exposure modelling, an SFO approximation of the geomean of the degradation was determined to see if this adequately described the DFOP behaviour. The geomean fast phase DT_{50} of the field studies is 72.8 days, the geomean slow phase DT_{50} is 145.3 days, and the g value is 0.37. These parameters resulted in a DFOP kinetic fit with a DT50 of 111 d and a DT90 of 403 d. The average dissipation behaviour in the field was found to be well approximated by an SFO model with a DT_{50} of 121.4 days (derived from the average DFOP DT90 of 403/3.32) (See section B.8.1.3, 3CA_B8).

Soil location	Fast phase k_1 DT_{50} (days)	Slow phase k_2 DT_{50} (days)	g value	Kinetic
Germany	78.8	78.8	-	SFO
Czech Republic	169.0	169.0	-	SFO
Italy	421.0	421.0	-	SFO
Spain	3.51	111.0	0.37	DFOP
Ontario	104.0	104.0	-	SFO
Geomean	72.8	145.3	-	-
Arithmetic mean	-	-	0.37	-
SFO approximation used for modelling	**121.4**		**-**	**SFO**

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

FIELD NORMALISED MODELLING ENDPOINTS									
1'-COOH-S-2840A and B	Aerobic conditions; parent dosed study (n = 5)								
Soil Type	Location	pH $CaCl_2$[a]	pH H_2O[b]	Depth (cm)[c]	DT_{50} (d) Norm.	DT_{90} (d) Norm.	St. (X^2)	f.f.	Method of calculation
Sandy clay loam, bare soil	Germany	6.0	6.5	0-30	75.4	250	14.4	0.77	SFO
Clay/silty clay, bare soil	Czech Republic	7.4	7.9	0-10	24.7	82.1	18.6	0.64	SFO
Sandy loam, bare soil	Italy	7.5	8.1	Not detected					
Loam, bare soil	Spain	4.4	5.0	0-0	224	744	6.44	0.17	SFO
Sandy loam, bare soil	Ontario	4.8 [b]	5.4	Not detected					
Geometric mean (if not pH dependent)					74.7	248			
Arithmetic mean								0.53	
pH dependence					No				

a) pH values are mean values for the soil across the depths at which residues were detected.

b) pH (H_2O) converted to pH ($CaCl_2$) using conversion given in the EFSA PECsoil guidance (2017)

c) Residue depth refers to the depths at which residues were detected plus the following soil layer.

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		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

FIELD NORMALISED MODELLING ENDPOINTS									
3'-OH-S-2840	Aerobic conditions; parent dosed study (n = 5)								
Soil Type	Location	pH $CaCl_2$[a]	pH H_2O[b]	Depth (cm)[c]	DT_{50} (d) Norm.	DT_{90} (d) Norm	St. (X^2)	f.f.	Method of calculation
Sandy clay loam, bare soil	Germany	6.0	6.5	0-30	96.6	321	18.2	0.18	SFO
Clay/silty clay, bare soil	Czech Republic	7.4	7.9	0-10	101	335	19.8	0.27	SFO
Sandy loam, bare soil	Italy	7.5	8.1	0-10	204	678	24.0	0.34	SFO
Loam, bare soil	Spain	4.4	5.0	0-0	149	495	15.5	0.13	SFO
Sandy loam, bare soil	Ontario	4.8 [b]	5.4	Not detected					
Geometric mean (if not pH dependent)					131	436			
Arithmetic mean								0.23	
pH dependence					No				

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

a) pH values are mean values for the soil across the depths at which residues were detected.

b) pH (H_2O) converted to pH ($CaCl_2$) using conversion given in the EFSA PECsoil guidance (2017)

c) Residue depth refers to the depths at which residues were detected plus the following soil layer.

Kinetic endpoints for soil calculations

Rate of degradation in soil active substance (annual)	383 days (SFO, maximum of field studies, not normalised)	
Rate of degradation in soil active substance (accumulation)	254 days (DFOP, maximum of laboratory studies, 20°C, pF2, normalisation not required)	
Rate of degradation in soil transformation products, normalised geometric mean (if not pH dependent)	1'-COOH-S-2840A and B combined ~~369 days (maximum, from metabolite-dosed laboratory study)~~ 840 days (maximum, from parent-dosed laboratory study)	3'-OH-S-2840 ~~840 days (maximum, from parent-dosed laboratory study)~~ 369 days (maximum, from metabolite-dosed laboratory study)
Maximum occurrence in soil [%] (laboratory)	1'-COOH-S-2840A and B combined from parent: 30.1	3'-OH-S-2840 from parent: 20.7

Kinetic endpoints for groundwater modelling

Rate of degradation in soil active substance, normalised geometric mean (if not pH dependent)	121.4 days (SFO approximation of the geometric mean of field data only)	
Rate of degradation in soil transformation products, normalised geometric mean (if not pH dependent)	1'-COOH-S-2840A and B combined 74.7 days (geometric mean based on field data only)	3'-OH-S-2840 131 days (geometric mean based on field data only)

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Kinetic formation fraction (f. f. kf / kdp) of transformation products, arithmetic mean	1'-COOH-S-2840A and B combined from parent: 0.53 (field study only, arithmetic mean)	3'-OH-S-2840 from parent: 0.23 (field study only, arithmetic mean)

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

Soil accumulation and plateau concentration	Plateau concentration of 0.069 mg/kg reached after 18 years (based on calculation) In the field accumulation study, modelling approaches indicate inpyrfluxam concentrations would plateau after 8 years (beyond duration of study). Soil accumulation should be addressed by standard modelling approaches and generation of an accumulation factor is not required. Metabolites did not accumulate in the study.

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

Parent	**Dark anaerobic conditions; non-normalised trigger endpoints, [^{14}C-]-pyrazolyl and phenyl labels (n = 4)**					
Soil Type	**pH[(a)]**	**t. °C / % MWHC**	**DT_{50} (d)**	**DT_{90} (d)**	**St. (X^2)**	**Method of calculation**
Silty loam	6.1	20 / flooded soil	>10,000	>10,000	1.51	SFO
Clayey silt	5.5	20 / flooded soil	1,210	4,030	1.05	SFO
Sandy loam	7.3	20 / flooded soil	1,850	6,140	0.69	SFO

Competent Authority	Month and year	Active Substance (Name)
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Silty sand	6.0	20 / flooded soil	2,970	9,880	0.97	SFO
Maximum (non-normalised) for trigger			>10,000	>10,000		
Geometric mean (if not pH dependent) for modelling						

a) Measured in water

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

Parent	Soil photolysis				
Soil type	**pH[(a)]**	**t. °C / % MWHC**	**DT_{50} (d) calculated at 50°N**	**St. (X^2)**	**Method of calculation**
Loam	6.8	20/75	591 (pyrazolyl label) 641 (phenyl label)	0.948 (pyrazolyl label) 3.37 (phenyl label)	SFO

a) Measured in water

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

Parent					
Soil Type	**OC %**	**Soil pH[(a)]**	**K_F (mL/g)**	**K_{Foc} (mL/g)**	**1/n**
Silt loam	2.4	6.1	18.71	780	0.956
Loam	3.8	5.5	19.02	500	0.939

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Loamy sand	1.2	5.5	10.70	891	0.996
Clay loam	1.6	7.4	9.91	619	0.932
Clay or clay loam	0.9	8.1	5.79	643	0.992
Sandy loam	0.3	7.0	1.59	531	0.942
Geometric mean (if not pH dependent)			8.38	647	
Arithmetic mean (if not pH dependent)					0.960
pH dependence			No		

a) Measured in 0.01 M calcium chloride solution

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

1'-COOH-S-2840A					
Soil Type	**OC %**	**Soil pH[(a)]**	**K_F (mL/g)**	**K_{Foc} (mL/g)**	**1/n**
Silt loam or Loam	2.9	7.3	1.057	35	0.939
Clay loam	1.6	7.4	0.190	11	0.966
Loamy sand	1.2	5.5	0.409	33	0.937
Sandy loam	0.7	5.8	0.080	11	0.962
Sandy loam	0.3	7.0	0.094	28	0.945
Geometric mean (if not pH dependent)			0.228	20.8	
Arithmetic mean (if not pH dependent)					0.950
pH dependence			No		

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a) Measured in 0.01 M calcium chloride solution

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

1'-COOH-S-2840B					
Soil Type	**OC %**	**Soil pH[(a)]**	**K_F (mL/g)**	**K_{Foc} (mL/g)**	**1/n**
Silt loam or Loam	2.9	7.3	1.30	45	0.927
Clay loam	1.6	7.4	0.25	16	0.949
Loamy sand	1.2	5.5	0.52	44	0.972
Sandy loam	0.7	5.8	0.10	15	0.923
Sandy loam	0.3	7.0	0.09	40	0.940
Geometric mean (if not pH dependent)			0.273	28.6	
Arithmetic mean (if not pH dependent)					0.942
pH dependence			No		

a) Measured in calcium chloride solution

Comparison of 1'-COOH-S-284A, 1'-COOH-S-2840B and mean sorption endpoints (mean value is used in exposure modelling)

	1'-COOH-S-2840A	**1'-COOH-S-2840B**	**Mean of both diastereomers[a)]**
Adsorption			
K_{foc} (L/kg)	20.8	28.6	24.4
1/n	0.950	0.942	0.946

a) Means of the two individual mean values for two isomers; K_{foc} geometric mean, 1/n arithmetic mean HSE data for Atwater soil, 1'-COOH-S-2840B, all other data applicant data

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

3'-OH-S-2840					
Soil Type	**OC %**	**Soil pH[(a)]**	**K_F (mL/g)**	**K_{Foc} (mL/g)**	**1/n**
Silt loam	2.9	7.3	14.26	492	0.8791
Clay loam	1.6	7.4	5.58	349	0.9561
Loamy sand	1.2	5.5	4.81	401	0.9729
Geometric mean (if not pH dependent)			7.26	410	
Arithmetic mean (if not pH dependent)					0.936
pH dependence			No		

a) Measured in calcium chloride solution

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

Column leaching	Mobility studies were not submitted or required

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

Column leaching	Mobility studies were not submitted or required

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

Lysimeter/ field leaching studies	Mobility studies were not submitted or required

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

Hydrolytic degradation of the active substance and metabolites > 10 %	pH 4: virtually no degradation over 5 days at 50 °C (inpyrfluxam) - hydrolytically stable. No metabolites met the trigger of ≥10 % AR
	pH 7: virtually no degradation over 5 days at 50 °C (inpyrfluxam) - hydrolytically stable. No metabolites met the trigger of ≥10 % AR
	pH 9: virtually no degradation over 5 days at 50 °C (inpyrfluxam) - hydrolytically stable. No metabolites met the trigger of ≥10 % AR

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

Direct photolytic degradation of active substance and metabolites above 10 %	No degradation rates have been calculated by HSE as direct aqueous photolysis of inpyrfluxam was considered to be negligible No metabolites met the trigger of ≥10 % AR
Quantum yield of direct phototransformation in water at Σ > 290 nm	A quantum yield was calculated in the test but not verified by HSE due to the lack of significant degradation.

Indirect photolytic degradation of active substance and metabolites above 10 %	[^{14}C- pyrazolyl] label: Artificial light DT_{50} : 92 d, natural light, 30-50 ^{o}N; DT_{50} 179 days [^{14}C- phenyl] label: artificial light DT_{50} : 41.2 d, natural light, 30-50 ^{o}N; DT_{50} 80 days Metabolite: 3'-OH-S-2840 max 8.6 % AR and still increasing at study end
Quantum yield of direct phototransformation in water at Σ > 290 nm	Not calculated.

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

Readily biodegradable?	Inpyrfluxam is not readily biodegradable.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

Parent (inpyrfluxam)

Phenyl label, high concentration (100 µg/L) [a]

System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sediment	t. °C [b]	DT_{50} /DT_{90} Water (pelagic test) [c]	St. (X^2)	Method of calculation
Fountains Abbey water (fresh water system) **PH-label, high rate**	8.0	N/A	20 ± 2	1540 / 5120	1.1	SFO

a) Degradation rates for concentrations and radiolabels other than PH-label high concentration are not presented in this table, as they are not statistically significant (> 0.1 t-test limit as per FOCUS guidelines).

b) Temperature of incubation=temperature that the environmental media was collected or std temperature of 20°C

c) Normalisation of temperature not required as system was incubated at a constant temperature of 20 ±2 °C

List of end points

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		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

Parent inpyrfluxam modelling and persistence endpoints				Distribution (max in sed 84.6 % after 112 d, Taunton River PY, average of two replicates for PY radiolabel)									
				Whole system			Water				Sediment		
Water / sediment system	pH water phase (mean)	pH sed	t. (°C) (b)	DT_{50} / DT_{90} (c)	St. (X^2)	Kinetic model	DissT50 / pseudo DissT50 (c)	DissT 90	St. (X^2)	Kinetic model	DissT50 / DissT90 (d)	St. (X^2)	Kinetic model
Golden Lake (a)	~~7.8~~ 8.0	~~N/A~~ 7.8	20 ± 2	>10,000 / >10,000	2.90	DFOP	2.67/ 34.28	113.8	2.433	DFOP	1000 / 3320	N/A	N/A
Taunton River (a)	~~5.9~~ 6.6	~~N/A~~ 5.9	20 ± 2	758/ 2518	3.23	SFO	1.63/ 17.38	57.71	4.076	DFOP	1000 / 3320	N/A	N/A
Goose River	~~7.9~~ 8.3	~~N/A~~ 7.9	20 ± 2	212/ 705	1.99	SFO	1.77/ 8.58	28.49	7.14	DFOP	1000 / 3320	N/A	N/A
Wewean tic River	~~5.7~~ 7.0	~~N/A~~ 5.7	20 ± 2	395/ 1312	1.13	SFO	3.04/ 29.59	98.23	6.55	DFOP	1000 / 3320	N/A	N/A
Sharkey	~~6.5~~ 7.9	~~N/A~~ 6.5	20 ± 2	364/ 1209	1.17	SFO	3.17/ 17.44	57.89	4.78	DFOP	1000 / 3320	N/A	N/A
Maximum (non-normalised)				~~758/2518~~ >10,000 / >10,000			3.17/ 34.28	113.8			1000 / 3320		

a) Phenyl and pyrazolyl label
b) Normalisation of temperature not required as systems were incubated at a constant temperature of 20 ±2 °C
c) Pseudo $DissT_{50}$ calculated from DT_{90}/3.32

List of end points

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		Inpyrfluxam

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d) No significant decline - 1000 day DT_{50} default used
N/A – not applicable or not stated where default values are used

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Metabolite 1'-COOH-S-2840 (A + B combined) modelling endpoints				Distribution: max in water 10 % after 112 days; Golden Lake PY label [b] Max. sed 4.8 % after 63 days, Golden Lake PH label [b] Max in total system 13.1 % after 112 days; Golden Lake PY label [b]	
				Water	Sediment
Water / sediment system	pH water phase (mean)	pH sed	t. °C [c]	$DissT_{50}$ / $DissT_{90}$	
Golden Lake [a]	~~7.8~~ 8.0	~~N/A~~ 7.8	20 ±2	DT_{50} and DT_{90} values could not be reliably determined from kinetic modelling for either water or sediment compartments. Resultantly, neither standard error or kinetic model are presented either. A conservative default DT_{50} value of 1000 days, and DT_{90} of 3320 days is recommended for use in the exposure assessment for both water and sediment.	
Taunton River [a]	~~5.9~~ 6.6	~~N/A~~ 5.9	20 ±2		
Goose River	~~7.9~~ 8.3	~~N/A~~ 7.9	20 ±2		
Weweantic River	~~5.7~~ 7.0	~~N/A~~ 5.7	20 ±2		
Sharkey	~~6.5~~ 7.9	~~N/A~~ 6.5	20 ±2		
Maximum (non-normalised) [c]				1000 / 3320	1000 / 3320

a) Phenyl and pyrazolyl label

b) Mean of two replicates. Values for isomers are combined (1'-COOH-S-2840 A + B).

c) Normalisation of temperature not required as systems were incubated at a constant temperature of 20 ±2 °C

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Metabolite 3'-OH-S-2840 modelling endpoints				Distribution: max in water 2.9 % after 0 days; Taunton River PY label [b] Max. sed 6.0 % after 30 days, Taunton River PY label [b] Max in total system 6.8 % after 30 days; Taunton River PY label [b]	
				Water	**Sediment**
Water / sediment system	**pH water phase (mean)**	**pH sed**	**t. °C [c]**	**$DissT_{50}$ / $DissT_{90}$**	
Golden Lake [a]	~~7.8~~ 8.0	~~N/A~~ 7.8	20 ±2	DT_{50} and DT_{90} values could not be reliably determined from kinetic modelling for either water or sediment compartments. Resultantly, neither standard error or kinetic model are presented either. A conservative default DT_{50} value of 1000 days, and DT_{90} of 3320 days is recommended for use in the exposure assessment for both water and sediment.	
Taunton River [a]	~~5.9~~ 6.6	~~N/A~~ 5.9	20 ±2		
Goose River	~~7.9~~ 8.3	~~N/A~~ 7.9	20 ±2		
Weweantic River	~~5.7~~ 7.0	~~N/A~~ 5.7	20 ±2		
Sharkey	~~6.5~~ 7.9	~~N/A~~ 6.5	20 ±2		
Maximum (non-normalised) [c]				1000 / 3320	1000 / 3320

a) a) Phenyl and pyrazolyl label

b) Mean of two duplicate samples analysed at the time point.

c) Normalisation of temperature not required as systems were incubated at a constant temperature of 20 ±2 °C

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Mineralisation and non-extractable residues (for parent inpyrfluxam dosed experiments)				
Water / sediment system	**pH water phase (mean)**	**pH sed**	**Mineralisation % at study end**	**Non-extractable residues in sed. max % at study end**
Golden Lake	~~7.8~~ 8.0	~~N/A~~ 7.8	0.4 % after 112 days (4 replicates, 2 radiolabels)	5.7 % after 112 days (4 replicates, 2 radiolabels)
Taunton River	~~5.9~~ 6.6	~~N/A~~ 5.9	0.2 % after 112 days (4 replicates, 2 radiolabels)	2.7 % after 112 days (4 replicates, 2 radiolabels)
Goose River	~~7.9~~ 8.3	~~N/A~~ 7.9	0.5 % after 111 days (average of 2 replicates; 1 radiolabel)	12.6 % after 111 days (average of 2 replicates; 1 radiolabel)
Weweantic River	~~5.7~~ 7.0	~~N/A~~ 5.7	0.0 % after 111 days (average of 2 replicates; 1 radiolabel)	3.2 % after 111 days (average of 2 replicates; 1 radiolabel)
Sharkey	~~6.5~~ 7.9	~~N/A~~ 6.5	0.1 % after 111 days (average of 2 replicates; 1 radiolabel)	4.8 % after 111 days (average of 2 replicates; 1 radiolabel)

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

Direct photolysis in air	**Not studied - no data requested**
Photochemical oxidative degradation in air	DT_{50} of 2.80 hours derived by the Atkinson model (version 1.92). OH (12 hour) concentration assumed = 1.5 x 10^6 mol/cm^3
Volatilisation (BBA guideline)	Due to the low vapour pressure of inpyrfluxam, of 3.81 x 10^{-8} Pa at 20°C, volatilisation from soil and plant surfaces was not evaluated.

List of end points

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		Inpyrfluxam

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Metabolites	Exposure for metabolites in air was not required

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

Environmental occurring residues requiring further assessment by other disciplines (toxicology and ecotoxicology) and or requiring consideration for groundwater exposure	Soil: Inpyrfluxam, 1'-COOH-S-2840 (A + B combined), 3'-OH-S-2840 Surface water: Inpyrfluxam, 1'-COOH-S-2840 (A + B combined), 3'-OH-S-2840 Sediment: Inpyrfluxam, 3'-OH-S-2840 Ground water: Inpyrfluxam, 1'-COOH-S-2840 (A + B combined), 3'-OH-S-2840 Air: Inpyrfluxam

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

	See section 5, Ecotoxicology

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

Soil	As a new active substance, there are no monitoring data available.
Surface water	As a new active substance, there are no monitoring data available.
Ground water	As a new active substance, there are no monitoring data available.

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		Inpyrfluxam

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Air	As a new active substance, there are no monitoring data available.

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

Inpyrfluxam

	Parameter	Value used for modelling concentrations in soil	Value used for modelling accumulation in soil
Parent	**DT_{50} (d)**	383	254
	Molecular weight (g/mol)	333.38	
Method of calculation	**Kinetics**	SFO	DFOP
	k_1	0.00181	0.00861
	k_2	-	0.000693
	g value	-	0.465
	Field or Lab	Representative worst case from field studies	Representative worst case from laboratory studies
Application data	**Crop**	Cereals	
	Application rate(s) (g a.s/ha)	90	
	Crop interception (%)	80	

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

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	Number of applications	1
	Interval (d)	-
	Depth of soil layer (cm)	5
	Soil bulk density (g/cm^3)	1.5

$PEC_{(s)}$ (mg/kg)	**Single application** **Actual**	**Single application** **Time weighted average**
Initial	0.024	
Short term 24h	0.024	0.024
2d	0.024	0.024
4d	0.024	0.024
Long term 7d	0.024	0.024
28d	0.023	0.023
50d	0.022	0.023
100d	0.020	0.022
Accumulation[a]	0.069 mg/kg after 18 years	

a) peak concentration in soil, directly after application, once the plateau concentration has been reached (time taken to reach plateau).

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		Inpyrfluxam

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3'-OH-S-2840

Method of calculation	Molecular weight (g/mol)	349.38
	DT_{50} (d)	369
	Kinetics	SFO
	Field or Lab	Representative worst case from laboratory studies.
	Maximum occurrence in soil (%)	20.7
Application rate assumed[a]	11.226 g/ha.. Accounting for accumulated parent in soil degrading.	

a) Application rate calculated as: (accumulated parent concentration in soil) x 750 x maximum occurrence in soil) x (metabolite molar mass / parent molar mass):
= 0.069 x 750 x 0.207 x (349.38 / 333.38)

$PEC_{(s)}$ (mg/kg)	Single application Actual
Initial	0.015
Accumulation[a]	0.030 mg/kg after 6 years

a) peak concentration in soil, directly after application, once the plateau concentration has been reached (time taken to reach plateau).

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

1'-COOH-S-2840

Metabolite I **Method of calculation**	Molecular weight (g/mol)	363.36
	DT_{50} (d)	840
	Kinetics	SFO
	Field or Lab	Representative worst case from laboratory studies.
	Maximum occurrence in soil (%)	30.1
Application rate assumed[(a)]	16.978 g/ha. Accounting for accumulated parent in soil degrading.	

a) Application rate calculated as: (accumulated parent concentration in soil) x 750 x maximum occurrence in soil) x (metabolite molar mass / parent molar mass):
= 0.069 x 750 x 0.301 x (363.36 / 333.38)

$PEC_{(s)}$ (mg/kg)	Single application Actual
Initial	0.023
Accumulation[(a)]	0.087 mg/kg after 17 years

a) peak concentration in soil, directly after application, once the plateau concentration has been reached (time taken to reach plateau).

Formulation

Dose rate (L/ha)	1.5
Formulation density (g/mL)	0.9273
Dose rate (g/ha)	1391
PECactual (mg formulation/kg)	0.371

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

Modelling using FOCUS model(s), with appropriate FOCUSgw scenarios, according to FOCUS guidance	
Model(s) used	PEARL v.5.5.5, PELMO v.6.6.4, MACRO v.5.5.4
Parent input parameters	
Molecular Mass (g/mol)	333.38
Crop uptake factor	0
Water solubility (mg/L) at pH 7 and 20°C	16.4
Vapour pressure at 20°C (Pa)	3.81 x 10^{-8}
Geometric mean Kfoc (mL/g)	647
Arithmetic mean 1/n	0.960
Geometric mean parent $DT_{50field}$ in d (SFO approximation of DFOP Field $DegT_{50}$ geomean, normalised to 10 kPa or pF2, 20 °C with Q10 of 2.58 and Walker equation coefficient 0.7, n = 5.)	121.4
Degradation rate constant (1/day) (parent to 3'-OH-S-2840)	0.001312
Degradation rate constant (1/day) (parent to 1'-COOH-S-2840)	0.0030261
Degradation rate constant (1/day) (parent to sink)	0.0013703
Crop and application data	
Crop	Spring and winter cereals

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Crop growth stage	BBCH 30 – 71
Application rate (g a.s/ha)	Parent (inpyrfluxam): 90
Crop interception (%)	80
No. of applications	1
3'-OH-S-2840 input parameters	
Molecular mass (g/mol)	349.38
Crop uptake factor	0
Water solubility (mg/L) at pH 7 and 20˚C	1000 (default value)
Vapour pressure at 20˚C (Pa)	3.81×10^{-8}
Geometric mean Kfoc (mL/g)	410
Arithmetic mean 1/n	0.936
Geometric mean 3'-OH-S-2840 $DT_{50field}$ (d) (normalisation to 10 kPa or pF2, 20 ˚C with Q10 of 2.58 and Walker equation coefficient 0.7, n = 4.)	131
Formation fraction (from parent)	0.23
Degradation rate constant (1/day) (3'-OH-S-2840 to sink)	0.0052912
1'-COOH-S-2840 input parameters	
Molecular mass (g/mol)	363.36
Crop uptake factor	0

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Water solubility (mg/L) at pH 7 and 20˚C	1000 (default value)
Vapour pressure at 20˚C (Pa)	3.81 x 10^{-8}
Geometric mean Kfoc (mL/g)	24.4
Arithmetic mean 1/n	0.946
Geometric mean 1'-COOH-S-2840A and B, $DT_{50field}$ (d) (normalised to 10kPa or pF2, 20 ˚C with Q10 of 2.58 and Walker equation coefficient 0.7, n = 3.)	74.7
Formation fraction (from parent)	0.53
Degradation rate constant (1/day) (1'-COOH-S-2840 to sink)	0.0092791
For field and lysimeter studies	
Lysimeter studies	Lysimeter studies were not submitted or required

Modelling dates for each scenario are given below.

Individual crop	Winter cereals, early	Winter cereals, late	Spring cereals, early	Spring cereals, late
Repeat interval for app. events	Every Year	Every Year	Every Year	Every Year
Application technique	Spray	Spray	Spray	Spray
Absolute / Relative to	Absolute	Absolute	Absolute	Absolute
BBCH code	30	71	30	71
Scenario	app. date (Julian day)	app. date (Julian day)	app. date (Julian day)	app. date (Julian day)
Châteaudun	15 April (105)	17 June (168)	16 April (106)	25 June (176)
Hamburg	04 May	27 June	28 April	03 July

Section 4 Environmental fate and behaviour

Kremsmuenster	24 April	29 June	27 April	03 July
Okehampton	21 April	13 June	22 April	24 June

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m)

Exceedances of the 0.1 µg/L limit value are shown in bold.

PEARL v.5.5.5 / Winter cereals, early

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.795**
Hamburg	0.003	0.008	**1.431**
Kremsmünster	0.002	0.006	**0.896**
Okehampton	0.003	0.009	**0.907**

PEARL v.5.5.5 / Winter cereals, late

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.813**
Hamburg	0.003	0.009	**1.458**
Kremsmünster	0.002	0.006	**0.905**
Okehampton	0.003	0.009	**0.927**

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

PEARL v.5.5.5 / Spring cereals, early

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.733**
Hamburg	0.003	0.009	**1.777**
Kremsmünster	0.002	0.006	**0.973**
Okehampton	0.003	0.008	**0.947**

PEARL v.5.5.5 / Spring cereals, late

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.760**
Hamburg	0.004	0.010	**1.802**
Kremsmünster	0.002	0.006	**0.984**
Okehampton	0.003	0.008	**0.965**

PELMO v.6.6.4 / winter cereals, early

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Châteaudun	< 0.001	< 0.001	**0.821**
Hamburg	< 0.001	0.003	**1.405**
Kremsmünster	< 0.001	0.002	**1.023**
Okehampton	< 0.001	0.004	**1.010**

PELMO v.6.6.4 / winter cereals, late

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.871**
Hamburg	< 0.001	0.003	**1.448**
Kremsmünster	< 0.001	0.002	**1.037**
Okehampton	< 0.001	0.004	**1.063**

PELMO v.6.6.4 / spring cereals, early

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.697**
Hamburg	< 0.001	0.003	**1.440**

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Kremsmünster	< 0.001	0.002	**1.059**
Okehampton	< 0.001	0.003	**0.993**

PELMO v.6.6.4 / spring cereals, late

Scenario	Parent (µg/L)	Metabolites (µg/L)	
		3'-OH-S-2840	1'-COOH-S-2840
Châteaudun	< 0.001	< 0.001	**0.743**
Hamburg	< 0.001	0.003	**1.502**
Kremsmünster	< 0.001	0.002	**1.085**
Okehampton	< 0.001	0.003	**1.016**

MACRO v5.5.4 / crops modelled	Scenario	Parent (µg/L)	Metabolites (µg/L)	
			3'-OH-S-2840	1'-COOH-S-2840
winter cereals, early	Châteaudun	< 0.001	< 0.001	**0.720**
winter cereals, late	Châteaudun	< 0.001	< 0.001	**0.758**
spring cereals, early	Châteaudun	< 0.001	< 0.001	**0.641**

spring cereals, late	Châteaudun	< 0.001	< 0.001	**0.677**

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

Calculation method	Spray drift: HSE Excel Calculator version 2.0.1 (first tier) Drainflow: HSE Excel Calculator version 2.0.1 (first tier); HSE MACRO drainflow tool version 2.2 (higher tier)
Parent input parameters (inpyrfluxam)	
Molecular Mass (g/mol)	333.38
Crop uptake factor	0 (worst case assumption)
Geometric mean Kfoc (mL/g)	647
Arithmetic mean 1/n	0.960
Geometric mean parent $DT_{50field}$ (d) (maximum non-normalised) – first tier drainflow only	383
Geometric mean parent DT50field (d) (SFO approximation of DFOP Field DegT50 geomean, (normalisation to 10kPa or pF2, 20 °C with Q10 of 2.58 and Walker equation coefficient 0.7) – higher tier drainflow only	121.4
$DissT_{50}$ water (d)	34.28 d (longest dissipation rate; n = 5)
$DissT_{50}$ sediment (d)	1000 d (longest dissipation rate; n = 5)

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

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Maximum in sediment (% AR)	84.6

1'-COOH-S-2840 input parameters	
Molecular mass (g/mol)	363.36
Crop uptake factor	0
Geometric mean Kfoc (mL/g)	24.4
Arithmetic mean 1/n	Not required as HTDF not needed
$DegT_{50}$ soil (d):	Not required as HTDF not needed
$DissT_{50}$ water (d):	1000 (worst case default)
DT_{50} sediment (d):	Not required. PECsed values not needed for risk assessment.
Maximum in soil (% AR)	30.1
Maximum in water (% AR)	10.0
Maximum in sediment (% AR)	Not required. PECsed values not needed for risk assessment.

3'-OH-S-2840 input parameters	
Molecular mass (g/mol)	349.38
Crop uptake factor	0
Geometric mean Kfoc (mL/g)	410
Arithmetic mean 1/n	Not required as HTDF not needed

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

$DegT_{50}$ soil (d):	Not required as HTDF not needed
$DissT_{50}$ water (d):	1000 (worst case default)
DT_{50} sediment (d):	Not required. PECsed values not needed for risk assessment.
Maximum in soil (% AR)	20.7
Maximum in water (% AR)	8.6
Maximum in sediment (% AR)	Not required. PECsed values not needed for risk assessment.

Crop and application data	
Crop	Spring and winter cereals
Crop growth stage	Winter and spring cereals: BBCH 30 – 71
Application rate(s)	Parent (inpyrfluxam): 90 g a.s./ha
Canopy interception (%)	80
No. of applications	1
Application window or application date	Winter cereals application dates: BBCH 30 – 15 April BBCH 71 – 29 June Spring cereals application dates: BBCH 30 – 16 April BBCH 71 – 3 July

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

MACRO parameters (Higher drainflow only)	Soil classes modelled for winter cereals: Denchworth, Hanslope, Brockhurst, Clifton Soil classes modelled for spring cereals: Hanslope, Brockhurst, Clifton Climate scenarios: Dry, medium, wet

Spring and winter cereals spray drift – Parent (inpyfluxam)

Buffer zone (m)	Drift rate (%)	PEC_{sw} (µg/L)	PEC_{sed} (µg/kg)	PECsed accumulation (µg/kg)
1	2.77	0.831	3.245	14.516
5	0.57	0.171	0.668	2.987

Spring and winter cereals spray drift – Metabolites[(a)]

Buffer zone (m)	Drift rate (%)	1'-COOH-S-2840	3'-OH-S-2840
		PEC_{sw} (µg/L)	PEC_{sw} (µg/L)
1	2.77	0.091	0.075

a) No PECsed values calculated for metabolites. PECsed values not needed for risk assessment as confirmed by HSE Ecotoxicology.

PECsw for formulation S-2399 60 g/L EC – single application

Buffer zone(m)	Drift rate (%)	Application rate of formulation (g/ha)[(a)]	Formulation PECsw (µg/L)
1	2.77	1391	12.844

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

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5	0.57		2.643

a) Based on an application rate of 1.5 L/ha and formulation density of 0.9273 g/mL.

Drainflow – Parent (tier 1, inside the drainflow period)			
Route of formation	**PEC_{sw} (µg/L)**	**PEC_{sed} (µg/L)**	**PEC_{sed} accumulation (µg/kg)**
Soil	0.692	2.703	12.093

Drainflow – metabolites (tier 1, formed in soil and in water)		
Route of formation	**1'-COOH-S-2840**	**3'-OH-S-2840**
	PEC_{sw} (µg/L)	**PEC_{sw} (µg/L)**
Soil	0.863	0.210
Water	0.075	0.062

Drainflow – parent inyrfluxam early applications (higher tier: MACRO); number of exceedances out of 30 (% in brackets)				
Climate scenario	This assessment was undertaken to resolve the risk to aquatic invertebrates/ fish at tier 1 (RAC = 0.660 µg/L)			
Climate scenario	Soil Class			
	Denchworth	Hanslope	Brockhurst	Clifton
Winter cereals early (BBCH 30, 80% crop interception, application date 15 April)				
Dry	0/30 (0%)	0/30 (0%)	0/30 (0%)	0/30 (0%)

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

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Medium	0/30 (0%)	0/30 (0%)	0/30 (0%)	0/30 (0%)
Wet	3/30 (10%)	0/30 (0%)	0/30 (0%)	0/30 (0%)
Spring cereals early (BBCH 30, 80% crop interception - application date 16 April)				
Dry	NA	0/30 (0%)	0/30 (0%)	0/30 (0%)
Medium	NA	0/30 (0%)	0/30 (0%)	0/30 (0%)
Wet	NA	0/30 (0%)	0/30 (0%)	0/30 (0%)

NA: not analysed. Denchworth scenario not relevant for spring cereals.

Outcome ('safe' years) for higher tier drainflow – winter and spring cereals.

Scenarios used:
Winter cereals – Denchworth, Hanslope, Brockhurst and Clifton; dry, medium and wet.
Spring cereals – Hanslope, Brockhurst and Clifton; dry, medium and wet.
See Volume 3CP B.8 (Environmental fate and behaviour) for details on scenario selection

	Winter cereals – early (BBCH 30)	Spring cereals – early (BBCH 30)
Undrained (%)	48.84	52.93
Peat (%)	3.05	3.31
Drained but 'safe' (%)	47.94	43.75
Drained and not 'safe' (%)	0.17	0.00
Total 'safe' years (%)	99.83	100.00

Drainflow – parent inpyrfluxam late applications (higher tier: MACRO); number of exceedances out of 30 (% in brackets)

	Soil Class

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

Climate scenario	Denchworth	Hanslope	Brockhurst	Clifton
Winter cereals late (BBCH 71, 80% crop interception - application date 29 June)				
Dry	0/30 (0%)	0/30 (0%)	0/30 (0%)	0/30 (0%)
Medium	4/30 (13.3%)	0/30 (0%)	0/30 (0%)	0/30 (0%)
Wet	6/30 (20%)	0/30 (0%)	0/30 (0%)	0/30 (0%)
Spring cereals late (BBCH 71, 80% crop interception - application date 3 July)				
Dry	NA	0/30 (0%)	0/30 (0%)	0/30 (0%)
Medium	NA	0/30 (0%)	0/30 (0%)	0/30 (0%)
Wet	NA	1/30 (3.3%)	0/30 (0%)	0/30 (0%)

NA: not analysed. Denchworth scenario not relevant for spring cereals.

Outcome ('safe' years) for higher tier drainflow – winter and spring cereals.

Scenarios used:
Winter cereals – Denchworth, Hanslope, Brockhurst and Clifton; dry, medium and wet.
Spring cereals – Hanslope, Brockhurst and Clifton; dry, medium and wet.

	Winter cereals – late (BBCH 71)	Spring cereals – late (BBCH 71)
Undrained (%)	48.84	52.93
Peat (%)	3.05	3.31
Drained but 'safe' (%)	47.62	43.69
Drained and not 'safe' (%)	0.48	0.06
Total 'safe' years (%)	99.52	99.94

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 4 Environmental fate and behaviour

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

Method of calculation	No other routes of exposure considered

PEC	
Maximum concentration	No other routes of exposure considered

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Ecotoxicology

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

Species	Test substances	Time scale	End point	Toxicity (mg/kg bw per day)
Birds				
Zebra finch (*T. guttata*)*	a.s.	Short-term, dietary (5 days)	LD_0	**38 mg a.s/kg bw/d**
Zebra finch (*T. guttata*)*	a.s.	Short-term, dietary (5 days)	NOEL	**19 mg a.s/kg bw/d**
Northern bobwhite (*C. virginianus*)	a.s	Short-term, dietary (5 days)	LD_{50}	>5620 ppm (>1348 mg a.s./kg bw/d)
Mallard duck (*A. platyrhynchos*)	a.s	Short-term, dietary (5 days)	LD_{50}	> 5620 ppm (>2136 mg a.s./kg bw/d)
Northern bobwhite (*C. virginianus*)	a.s	14 day acute oral study	LD_{50}	>2250 mg a.s/kg bw
Mallard duck (*A. platyrhynchos*)	a.s	14 day acute oral study	LD_{50}	> 1350 mg a.s./kg bw
Northern bobwhite (*C. virginianus*)*	a.s	Reproduction, dietary (21 weeks)	NOED	44.3 mg a.s./kg bw/day
Mallard duck (*A. platyrhynchos*)	a.s	Reproduction, dietary (20 weeks)	NOEC	1000 ppm (130 mg a.s./kg bw/day)
Mammals				
Rat (female)	a.s.	Acute	LD_{50}	180

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Rat (female)	a.s.	Long-term	NOAEL	25 (Based on body weight change and Indices of gestation, litter size, pup and litter weight)
Endocrine disrupting properties (Annex Part A, points 8.1.5) Based on current guidance and following consideration of EATS modalities, inpyrfluxam doe not meet the criteria of being an endocrine disruptor (ED) for birds or wild mammals.				
Additional higher tier studies (Annex Part A, points 10.1.1.2): No additional higher tier studies submitted.				
Terrestrial vertebrate wildlife (birds, mammals, reptile and amphibians) (Annex Part A, points 8.1.4, 10.1.3): -				

*The short-term dietary study endpoints for the Zebra finch have been selected for use in the risk assessment as they are lower than the endpoints from the acute and reproductive studies.
Endpoints in **bold** will be used in risk assessment

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

Cereals (BBCH 30 – 71) at 90 g a.s./ha, 1 application

Growth stage	Indictor or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Steps (Birds)					
All	Small omnivorous bird	Acute	14.29	**2.66**	10
All	Small omnivorous bird	Acute	14.29	2.66	1*
All	Small omnivorous bird	Long-term	3.09	6.15	5
Tier 1 (Birds)					
Cereal BBCH 30 -39	Small omnivorous bird “lark”	Acute	1.08	35.19	1*
Cereals BBCH ≥ 40	Small omnivorous bird “lark”	Acute	0.65	58.64	1*
Cereals late post-emergence	Small insectivorous bird “passerine”	Acute	5.18	**7.33**	1*

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

(May-June) BBCH 71-89					
Cereals late season – seed heads	Small granivorous/insectivorous bird “bunting”	Acute	0.36	105.56	1*
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	10.65	16.9	10
All	Small herbivorous mammal	Long-term	2.3	10.9	5
Risk from bioaccumulation and food chain behaviour					
Indicator or focal species		**Time scale**	**DDD (mg/kg bw per day)**	**TER**	**Trigger**
Earthworm-eating birds		Long-term	0.305	62.33	5
Earthworm-eating mammals		Long-term	0.37	67.28	5
Fish-eating birds		Long-term	0.0285	667.6	5
Fish-eating mammals		Long-term	0.0254	983.6	5
Risk from consumption of contaminated water					
Scenarios	**Indicator or focal species**	**Timescale**	**PECdwxDWR**	**TER**	**Trigger**
Puddle scenario, Screening step **Application rate (g a.s./ha)/relevant endpoint < 3000 (koc > 500 L/kg), TER calculation not needed**					

*Acceptable acute risk demonstrated based on the geomean approach and trigger value of 1

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Risk to birds and mammals from plant metabolites

Cereals (BBCH 30 – 71) at 90 g a.s./ha, 1 application

Growth stage	Indictor or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
3'-OH-S-2840, *N*-des-Me-S-2840, *N*-des-Me-DFPA, DFPA, *N*-des-Me-1'-CH_2OH-S-2840 **Tier I (Birds)**					
Cereal BBCH 30-39	Small omnivorous bird '"lark"	Acute	1.08	**3.52**	10
Cereal BBCH ≥ 40	Small omnivorous bird "lark"	Acute	0.65	**5.86**	10
Cereals late post-emergence (May-June) 71-89	Small insectivorous bird "passerine"	Acute	5.18	**0.73**	10
Late season – seed heads	Small granivorous/insectivorous bird "bunting"	Acute	0.36	10.56	10
Cereal BBCH 30-39	Small omnivorous bird '"lark"	Long-term	0.486	**3.90**	5
Cereal BBCH ≥ 40	Small omnivorous bird "lark"	Long-term	0.297	6.39	5
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird "passerine"	Long-term	2.02	**0.94**	5
Late season – seed heads	Small granivorous/insectivorous bird "bunting"	Long-term	0.42	**4.49**	5
Refined Tier 1 (Birds)*					
Cereal BBCH 30 -39	Small omnivorous bird "lark"	Acute	0.30	12.57	10
Cereals BBCH ≥ 40	Small omnivorous bird "lark"	Acute	0.18	20.94	10

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Acute	1.45	**2.62**	10
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Acute	1.45	**2.62**	1**
Cereal BBCH 30 -39	Small omnivorous bird “lark”	Long-term (metabolite N-des-Me-DFPA)	0.13	13.96	5
Late season – seed heads	Small granivorous/insectivorous bird “bunting”	Long-term (metabolite N-des-Me-DFPA)	0.12	15.8	5
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Long-term (metabolite N-des-Me-DFPA)***	0.56	**3.39**	5
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Long -term (metabolite 3’OH’S-2840) ***	0.45	**4.26**	5
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Long -term (metabolite DFPA) ***	0.47	**4.0**	5
Cereals late post-emergence	Small insectivorous bird “passerine”	N-des-Me-S-2840	0.28	6.59	5

Section 5 Ecotoxicology

(May-June) BBCH 71-89		(metabolite N-des-Me-S-2840)			
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Long term (Metabolite Glc-NDM-S-2399A)	0.077	24.8	5
Cereals late post-emergence (May-June) BBCH 71-89	Small insectivorous bird “passerine”	Long term (Metabolite) N-des-Me-1’CH_2OH-S-2840	0.26	7.25	5
Risk from bioaccumulation and food chain behaviour					
Not required					

*Refined by the maximum %TRR value for the metabolite across all plant matrices
**Acceptable acute risk from metabolites is demonstrated using the same geomean approach with a trigger value of 1
***Unacceptable risk for the metabolites: N-des-Me-DFPA, 3’OH’-S-2840 and DFPA at tier 1 when considering 10 times greater toxicity than the parent and refining the DDD by maximum %TRR values; however, this was resolved based on mammalian toxicity data for the metabolites that show similar or greatly reduced toxicity compared to the parent.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

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

Test substance	Test organism	Test system	Endpoint	
Acute toxicity to fish				
Inpyrfluxam S-2399	*Oncorhynchus mykiss*	96-hour, static	Mortality, LC_{50}	**0.031 mg a.s./L (t.w.a)**
Inpyrfluxam S-2399	*Lepomis macrochirus*	96-hour, static	Mortality, LC_{50}	0.054 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Pimephales promelas*	96-hour, static	Mortality, LC_{50}	0.050 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Cyprinus carpio*	96-hour, static	Mortality, LC_{50}	0.067 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Cyprinodon variegatus*	96-hour, static	Mortality, LC_{50}	0.15 mg a.s./L (m.m)
Inpyrfluxam S-2399	*Poecilia reticulata*	96-hour, static	Mortality, LC_{50}	0.35 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Oryzias latipes*	96-hour, static	Mortality, LC_{50}	0.79 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Danio rerio*	96-hour, static	Mortality, LC_{50}	0.30 mg a.s./L (t.w.a)
Inpyrfluxam S-2399	*Species sensitivity distribution (SSD)*	96-hour, static	Mortality, HC_5	**0.018 mg a.s./L**
3'-OH-S-2840	*Oncorhynchus mykiss*	96-hours, static	Mortality, LC_{50}	**> 6.2 mg met./L (m.m.)**
1'-COOH-S-2840	*Oncorhynchus mykiss*	96-hours, static	Mortality, LC_{50}	**> 50 mg met./L (m.m.)**
S-2399 6EC	*Oncorhynchus mykiss*	96-hour, static	Mortality, LC_{50}	0.022 mg a.s./L (m.m.)

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Test substance	Test organism	Test system	Endpoint	
Chronic toxicity to fish				
Inpyrfluxam S-2399	*Pimephales promelas*	32-day, flow-through	Larval survival, LC_{10}	**0.0066 mg a.s./L (m.m.)**
Inpyrfluxam S-2399	*Cyprinodon variegatus*	34-day, flow-through	Larval survival, NOEC[a]	0.009 mg a.s./L (m.m.)
Bioconcentration in fish				
Inpyrfluxam S-2399	*Lepomis macrohirus*	31-day, flow-through	Lipid normalised, growth corrected, kinetic bioconcentration factor ($BCF_{kgL,TRR}$)	**215.4 L/kg (Total 14C residue basis)**
			Lipid normalised, steady state bioconcentration factor ($BCF_{SSL,\ S\text{-}2399}$)	**38.4 L/kg (S-2399)**
Acute toxicity to invertebrates				
Inpyrfluxam S-2399	*Daphnia magna*	48-hour, static	Immobility, EC_{50}	**1.1 mg a.s./L** (t.w.a)
Inpyrfluxam S-2399	*Americamysis bahia*	48-hour, static	Mortality, LC_{50}	**1.1 mg a.s./L** (m.m)
S-2399 6EC	*Daphnia magna*	48-hour, static	Immobility, EC_{50}	**0.26 mg a.s./L (m.m)**
Long-term toxicity to invertebrates				
Inpyrfluxam S-2399	*Daphnia magna*	21-day, static-renewal	Reproduction, NOEC	0.13 mg a.s./L (t.w.a)
			Reproduction, EC_{10}	**0.21 mg a.s./L** (t.w.a)
Toxicity to sediment-dwelling organisms				
Inpyrfluxam S-2399	*Leptocheirus plumulosus*	28-day, static	Growth, NOEC[a]	**10.26 mg a.s./kg**

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Test substance	Test organism	Test system	Endpoint	
		renewal		**sediment (t.w.a)**
Toxicity to algae				
Inpyrfluxam S-2399	*Pseudokirchneriella subcapitata*	96-hour, static	Growth rate:	
			E_rC_{50} (72 h)	>23 mg a.s./L (m.m)
			E_rC_{10} (72 h)	6.4 mg a.s./L (m.m)
Inpyrfluxam S-2399	*Navicula pelliculosa*	96-hour, static	Growth rate:	
			E_rC_{50} (72 h)	10.1 mg a.s./L (m.m)
			E_rC_{10} (72 h)	3.44 mg a.s./L (m.m)
Inpyrfluxam S-2399	*Skeletonema costatum*	96-hour, static	Growth rate:	
			E_rC_{50} (96 h)	1.28 mg a.s./L (m.m)
			E_rC_{10} (96 h)	0.34 mg a.s./L (m.m)
Geomean of two diatom E_rC_{50} endpoints (*Skeletonema costatum* and *Navicula pelliculosa*)				**3.60 mg a.s./L**
S-2399 6EC	*Pseudokirchneriella subcapitata*	72-hour, static	E_rC_{50} (72 h)	**0.447 mg a.s./L (m.m)**
			E_rC_{10} (72 h)	0.112 mg a.s./L (m.m)
Toxicity to aquatic macrophytes				
Inpyrfluxam S-2399	*Lemna gibba*	7-day, semi-static	Growth rate:	
			E_rC_{50} (dry weight)	**> 24 mg a.s./L (m.m)**
			E_rC_{10} (dry weight)	11 mg a.s./L (m.m)

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Test substance	Test organism	Test system	Endpoint	
Further testing on aquatic organisms				
Inpyrfluxam S-2399	*Crassostrea virginica*	96-hour, - flow through	Growth, EC_{50}	>0.99 mg a.s./L (m.m)
Further testing on aquatic organisms A SSD was constructed with the acute fish mortality endpoints. This calculated a HC_5 = **0.018 mg a.s./L**. This endpoint is to be used with an AF = 9 in risk assessment, suitable for a median acute HC_5 based on 96h LC_{50} endpoints for fish, outlined in EFSA Journal 2013;11(7):3290.				
Potential endocrine disrupting properties (Annex Part A, point 8.2.3) Based on the consideration of the submitted studies for EATS modalities together with the current guidance, inpyrfluxam does not meet the criteria of being an endocrine disruptor (ED) for aquatic organisms.				

(nom) nominal concentration; (m.m) mean measured concentration; (t.w.a) time-weighted average.

[a] Due to the lack of model fit robust EC_{10} and EC_{20} values could not be generated.

Endpoints in **bold** were used in risk assessment.

Bioconcentration in fish (Annex Part A, point 8.2.2.3)

	Active substance
$LogP_{o/w}$	3.65
Steady-state bioconcentration factor (BCF) (total wet weight/normalised to 5% lipid content)	38.4 L/kg (inpyrfluxam)
Uptake/depuration kinetics BCF (total wet weight/normalised to 5% lipid content)	215.4 L/kg (total ^{14}C)
Annex VI Trigger for the bioconcentration factor*	100

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Clearance time (days) (CT_{50})	0.401 days
(CT_{90})	Not reported
Level and nature of residues (%) in organisms after the 14-day depuration phase	A 3-day depuration phase resulted in at least a 91.1 % reduction.

* Trigger of 100 for not readily biodegradable substances. EFSA Journal 2013;11(7):3290 proposes a biomagnification risk assessment analogous to the EFSA Journal 2009; 7(12):1438 fish and bird-eating mammal risk assessment. This determined an acceptable risk. No further consideration is required.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

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

PEC / RAC ratios for inpyrfluxam – Cereals (BBCH 30 – 71) at 90 g a.s./ha, 1 application

Group		Fish acute	Fish prolonged	Inverteb. acute	Inverteb. prolonged	Algae	Aquatic macrophytes	Group	Sed. Dwell. Prolonged
Test species		*O. mykiss*	*P. promelas*	*D. magna*	*D. magna*	Geomean of 2 diatoms	*L. gibba*	Test species	*L. plumulosus*
Endpoint (µg/L)		LC_{50}	LC_{10}	EC_{50}	EC_{10}	Geomean E_rC_{50}	E_rC_{50}	Endpoint	NOEC
		31	6.6	1100	210	3600	24000	(µg/kg)	10260
AF		100	10	100	10	10	10	AF	10
RAC (µg/L)		0.31	0.66	11	21	360	2400	RAC (µg/kg)	1026
Entry route	PEC_{sw} (µg/L)	PEC/RAC						$PEC_{sed,\ accumulation}$ (µg/kg)	PEC/RAC
Spray drift (1 m)	0.831	**2.68**	**1.26**	0.076	0.040	0.0023	0.00035	14.516	0.014
Spray drift (5 m)	0.171	0.55	0.26	-	-	-	-	-	-
Drainflow	0.692	**2.23**	**1.05**	0.063	0.033	0.0019	0.00029	12.093	0.012

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

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

Higher tier assessment required for acute and chronic fish exposure via drainflow:

An acceptable acute risk to fish for exposure via drainflow was determined using a HC_5 (SSD). An acceptable chronic risk to fish was determined through a detailed case-by-case assessment of the higher tier drainflow modelling. See B9 (3CP) for more details.

PEC / RAC ratios for 3'-OH-S-2840 – Cereals at 90 g a.s./ha, 1 application

Group		**Fish acute**	**Fish chronic**	**Invertebrate acute**	**Invertebrate chronic**	**Algae**
Test species		***O. mykiss***	***extrapolated***	***extrapolated***	***extrapolated***	***extrapolated***
Endpoint		LC_{50}	EC_{10}	EC_{50}	EC_{10}	E_rC_{50}
(µg/L)		>6200	6.6	1100	210	3600
AF		100	10	100	10	10
RAC (µg/L)		62	0.66	11	21	360
Entry route	**PEC_{sw} (µg/L)**	**PEC / RAC**				
Drift (1 m)	0.075	0.0012	0.1136	0.0068	0.0036	0.0002
Drainage	0.210	0.003	0.318	0.019	0.01	0.001

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

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

PEC / RAC ratios for 1'-COOH-S-2840 – Cereals at 90 g a.s./ha, 1 application

Group		Fish acute	Fish chronic	Fish chronic	Invertebrate acute	Invertebrate chronic	Algae
Test species		*O. mykiss*	*extrapolated*	*extrapolated and refined*	*extrapolated*	*extrapolated*	*extrapolated*
Endpoint		LC_{50}	EC_{10}	EC_{10}	EC_{50}	EC_{10}	E_rC_{50}
(µg/L)		>50000	6.6	10646*	1100	210	3600
AF		100	10	100*	100	10	10
RAC (µg/L)		500	0.66	106.5	11	21	360
Entry route	PEC_{sw} / PEC_{gw} (µg/L)	PEC / RAC					
Drift (1 m)	0.091	0.0002	0.1379	0.0009	0.0083	0.0043	0.0003
Drainage	0.863	0.002	**1.31**	0.0081	0.078	0.041	0.002
Groundwater	0.18	0.0004	0.273	0.0017	0.016	0.009	0.0005

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

* Chronic fish endpoint extrapolation incorporated acute toxicity relationship between a.s. and metabolite. Due to this uncertainty, an AF = 100 was applied. Please see B9 (3CP) for further details.

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

PEC / RAC ratios for S-2399 6EC– Cereals at 90 g a.s./ha, 1 application

Group		Fish	Inverteb. acute	Algae*
Test species		*O. mykiss*	*D. magna*	*P. subcapitata*
Endpoint		LC_{50}	EC_{50}	E_rC_{50}
(µg a.s/L)		22	260	447
AF		100	100	10
RAC (µg a.s/L)		0.22	2.6	44.7
Entry route	PEC_{sw} (µg a.s./L)	PEC/RAC		
Spray drift (1 m)	0.831	**3.78**	0.320	0.0186
Spray drift (5 m)	0.171	0.78	-	-

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

* *P. subcapitata*, is not the most sensitive algal taxonomic group for the active substance (diatoms). An illustrative risk assessment using a corrected formulation endpoint for diatoms, based on the toxicity ratio of the active substance and formulation for *P. subcapitata*, also demonstrated an acceptable risk (PEC/RAC = 0.119). Please see Volume 3CP B9 for further details.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

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

Test Item	Study type	Species	Endpoint	Results
Acute adult				
Inpyrfluxam	48 h acute oral	*Apis mellifera*	LD_{50}	**>111.3 µg a.s./bee**
Inpyrfluxam	48 h acute contact			**>100 µg a.s./bee**
Inpyrfluxam	48 h acute oral	*Bombus terrestris*	LD_{50}	>95.1 µg a.s./bee
Inpyrfluxam	48 h acute contact			>100 µg a.s./bee
S-2399 6EC	48 h acute oral	*Apis mellifera*	LD_{50}	**17.99 µg a.s./bee**
	48 h acute contact			**16.55 µg a.s./bee**
S-2399 6EC	48 h acute oral	*Bombus terrestris*	LD_{50}	>34.74 µg a.s./bee
	48/72 h acute contact	*Bombus terrestris*		>200 µg a.s./bee
Chronic adult				
S-2399 6EC	10 d chronic	*Apis mellifera*	LDD_{50}	8.76 µg a.s./bee/day
			NOEDD	3.05 µg a.s./bee/day
Larvae				
S-2399 6EC	22 d chronic	*Apis mellifera*	ED_{50}	18.01 µg a.s./larva
			NOED	10.65 µg a.s./larva

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Risk assessment for – Cereals at 90 g a.s./ha, 1 application

Species	Substance	Endpoint	Application rate (g a.s./ha)	LD_{50} (µg a.s./bee)	Calculated Q_H	Acceptable Risk? ($Q_H \leq 50$)
A. mellifera	Inpyrfluxam	Acute oral	90	>111.3	< 0.809	yes
A. mellifera	Inpyrfluxam	Acute contact	90	>100	< 0.900	yes
A. mellifera	S-2399 6EC	Acute oral	90	17.99	5.00	yes
A. mellifera	S-2399 6EC	Acute contact	90	16.55	5.44	yes

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

Laboratory tests with standard sensitive species

Species	Test substance	End point	Toxicity
Typhlodromus pyri	S-2399 6EC, preparation	Mortality, LR_{50}	60.68 g a.s/ha
Aphidius rhopalosiphi	S-2399 6EC, preparation	Mortality, LR_{50}	49.1 g a.s/ha

First tier risk assessment for - Cereals at 90 g a.s/ha, 1 application

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	HQ off-field[1]	Trigger
S-2399 60 g/l EC	*Typhlodromus pyri*	60.68	1.48	0.04	2
S-2399 60 g/l EC	Aphidius rhopalosiphi	49.1	1.83	0.05	2

Section 5 Ecotoxicology

[1] Distance assumed to calculate the drift rate = 1 m.
HQ = Hazard Quotient

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

Test item	Exposure system	Species	Endpoint	Results
Earthworms				
S-2399 TG	Soil 56 d chronic 5% peat content	*Eisenia fetida*	EC_{10}	21.5 mg a.s./kg soil dw
			NOEC	6.25 mg a.s./kg soil dw
			$NOEC_{corr}$	**3.125 mg a.s./kg soil dw**
3'-OH-S-2840	Soil 56 d chronic 5% peat content	*Eisenia fetida*	EC_{10}	>100 mg/kg soil dw
			NOEC	100 mg/kg soil dw
			$NOEC_{corr}$	**50 mg/kg soil dw**
1'-COOH-S-2840	Soil 56 d chronic 5% peat content	*Eisenia fetida*	EC_{10}	52.4 mg/kg soil dw
			NOEC	**50 mg/kg soil dw**
S-2399 6EC	Soil 56 d chronic 10% peat content	*Eisenia andrei*	NOEC	1.56 mg a.s./kg soil dw
			$NOEC_{corr}$	**0.78 mg a.s./kg soil dw**
Other soil macroorganisms				
S-2399 TG	Soil 14 d, chronic 5% peat content	*Hypoaspis aculeifer*	EC_{10}	>100 mg a.s./kg soil dw
			NOEC	100 mg a.s./kg soil dw
			$NOEC_{corr}$	**50 mg a.s./kg soil dw**
S-2399 TG	Soil 28 d, chronic 5% peat content	*Folsomia candida*	EC_{10}	>100 mg a.s./kg soil dw
			NOEC	100 mg a.s./kg soil dw

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Test item	Exposure system	Species	Endpoint	Results
			$NOEC_{corr}$	**50 mg a.s./kg soil dw**
3'-OH-S-2840	Soil 14 d, chronic 5% peat content	*Hypoaspis aculeifer*	EC_{10}	>100 mg/kg soil dw
			NOEC	100 mg/kg soil dw
			$NOEC_{corr}$	**50 mg/kg soil dw**
3'-OH-S-2840	Soil 28 d, chronic 5% peat content	*Folsomia candida*	EC_{10}	>100 mg/kg soil dw
			NOEC	100 mg/kg soil dw
			$NOEC_{corr}$	**50 mg/kg soil dw**
1'-COOH-S-2840	Soil 14 d, chronic 5% peat content	*Hypoaspis aculeifer*	EC_{10}	>100 mg/kg soil dw
			NOEC	**100 mg/kg soil dw**
1'-COOH-S-2840	Soil 28 d, chronic 5% peat content	*Folsomia candida*	EC_{10}	>100 mg/kg soil dw
			NOEC	**100 mg/kg soil dw**
S-2399 6EC	Soil 14 d, chronic 5% peat content	*Hypoaspis aculeifer*	EC_{10}	15.25 mg a.s./kg soil dw
			NOEC	10.08 mg a.s./kg soil dw
			$NOEC_{corr}$	**5.04 mg a.s./kg soil dw**
S-2399 6EC	Soil 28 d, chronic 5% peat content	*Folsomia candida*	NOEC	3.27 mg a.s./kg soil dw
			$NOEC_{corr}$	**1.635 mg a.s./kg soil dw**

[a] Active substance content of the formulation; density 0.9273 g/mL, 60.68 g a.s./L (corresponding to 6.544% w/w)

Endpoints highlighted in **bold** used in the risk assessment (lowest of the NOEC and EC_{10})

Due to log P_{OW} > 2 (log Pow = 3.65 for S-2399 at pH 7.1 – 7.3; log Pow = 2.53 for 3'-OH-S-2840 at pH 6.5), endpoints from earthworm studies conducted in artificial soil were corrected for S-2399 and 3'-OH-S-2840 to account for the difference in organic matter in agricultural soils.

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

Test Item	Exposure system	Results
S-2399 TG	28 d natural soil	Effects < 25% after 28 days at 0.27 and **1.33 mg a.s./kg soil dw**
3'-OH-S-2840	28 d natural soil	Effects < 25% after 28 days at 0.06 and **0.3 mg/kg soil dw**
1'-COOH-S-2840	28 d natural soil	Effects < 25% after 28 days at 0.1 and **0.5 mg/kg soil dw**

Endpoints highlighted in **bold** used in the risk assessment

Toxicity / Exposure ratios for soil organisms

Cereals at 90 g a.s./ha, 1 application

Chronic effects on earthworms			
Test compound	**$NOEC/NOEC_{corr}$ (mg/kg dw)**	**$PEC_{soil,\ accumulation}$ (mg/kg dw)**	**TER_{lt} (criterion TER ≥ 5)**
S-2399 6EC (mg a.s./kg dw)	0.78	0.069	11.3
S-2399	3.125	0.069	45.3
3'-OH-S-2840	50	0.030	1667
1'-COOH-S-2840	50	0.087	575
Chronic effects on other soil macro- and mesofauna			
Test compound	**$NOEC/NOEC_{corr}$ (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**TER_a (criterion TER ≥ 5)**
Folsomia candida			
S-2399 6EC (mg a.s./kg dw)	1.64	0.069	23.8
S-2399	50	0.069	725
3'-OH-S-2840	50	0.030	1667
1'-COOH-S-2840	100	0.087	1149
Hypoaspis aculeifer			
S-2399 6EC (mg a.s./kg dw)	5.04	0.069	73
S-2399	50	0.069	725

3'-OH-S-2840	50	0.030	1667
1'-COOH-S-2840	100	0.087	1149

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

Screening data

Test type	Test substance	Test species	Endpoint	Results (g a.s./ha)
21 d Seedling emergence	S-2399 60 g/l EC[a]	*Lolium perenne* [m] *Allium cepa* [m] *Brassica napus* [d] *Glycine max* [d] *Lactuca sativa* [d] *Beta vulgaris* [d]	ER_{50}	**≥ 91**
21 d Vegetative vigour	S-2399 60 g/l EC[a]	*Lolium perenne* [m] *Allium cepa* [m] *Brassica napus* [d] *Glycine max* [d] *Lactuca sativa* [d] *Beta vulgaris* [d]	ER_{50}	**≥ 91**

D = dicot species, M = monocot species. a= formulated product.

The data requirements for non-herbicidal active substances and NTP (as in Regulation EU 283/2013) state that at least six species, including monocots and dicots, should be tested at the maximum proposed single application rate. The applicant has submitted two studies covering ten different species including monocots and dicots. The application rate tested was above the proposed application rate. No effects greater than 50% were observed. At the screening step it is only necessary to show < 50% effects at the maximum proposed single application rate, so no further risk assessment is required.

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

Test type / organism	End point
Activated sludge	3-hour EC_{50} > 100 mg/L

List of end points

Competent Authority	Month and year	Active Substance (Name)
		Inpyrfluxam

Section 5 Ecotoxicology

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

No monitoring data available.

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

Compartment	
Soil	Inpyrfluxam, 1'-COOH-S-2840
Surface water via spraydrift	Inpyrfluxam
Surface water via drainflow	Inpyrfluxam
Sediment	No ecotoxicologically relevant residues
Groundwater	Inpyrfluxam

[1] metabolites are considered relevant when, based on the risk assessment, they pose a risk comparable or higher than the parent

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

Substance	Name
Mandatory classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process as applicable in GB:	Classification and labelling is currently under evaluation. A mandatory classification and labelling report is being prepared under GB CLP by HSE. Therefore, this section will be completed at a later stage following the

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Section 5 Ecotoxicology

	aligned evaluation process and when the report is complete.
GB Authority proposal[4] for harmonised classification according to Regulation (EC) No 1272/2008 as applicable in GB:	Aquatic Acute 1; H400: Very toxic to aquatic life. Acute M-Factor of 10 Aquatic Chronic 1; H410: Very toxic to aquatic life with long lasting effects. Chronic M-Factor of 10

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

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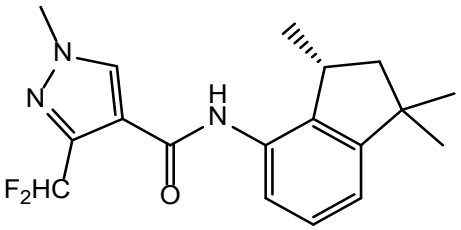
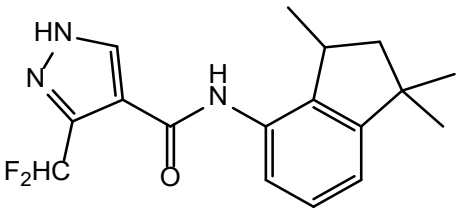
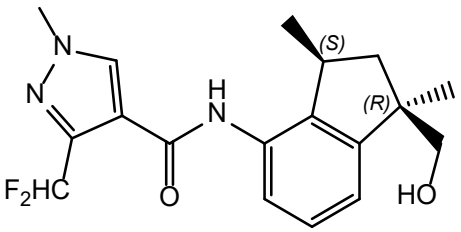
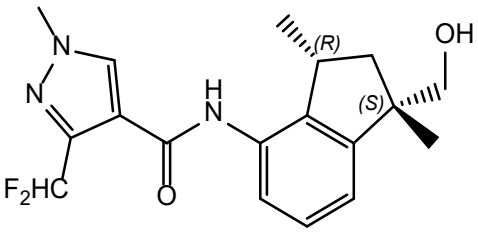
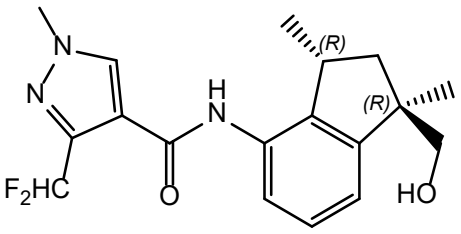
Appendix

Used Compound Code(s)

Code / Trivial name*	IUPAC name / SMILES notation	Structural formula
Inpyrfluxam	(*R*)-3-(difluoromethyl)-1-methyl-*N*-(1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-S-2840	3-(difluoromethyl)-*N*-(1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
1'-CH_2OH-S-2840A	3-(difluoromethyl)-*N*-((1*R*,3*S*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	
1'-CH_2OH-S-2840A	3-(difluoromethyl)-*N*-((1*S*,3*R*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	
1'-CH_2OH-S-2840B	3-(difluoromethyl)-*N*-((1*R*,3*R*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	

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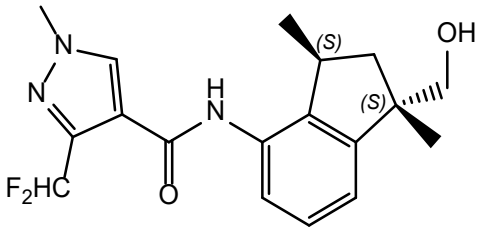
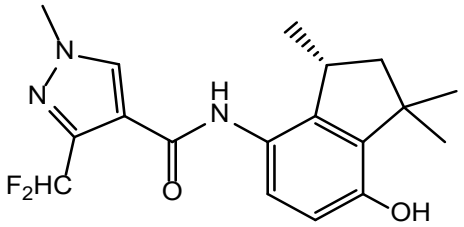
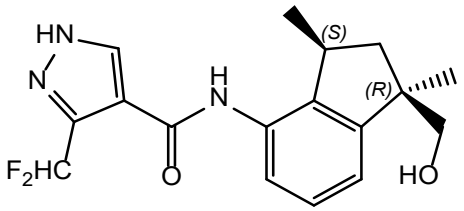
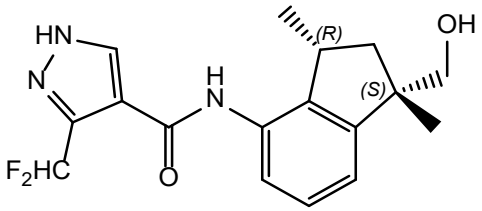
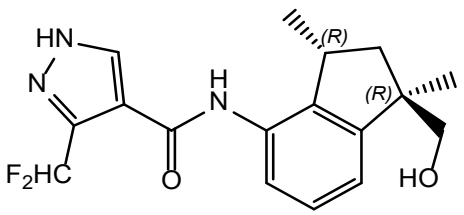
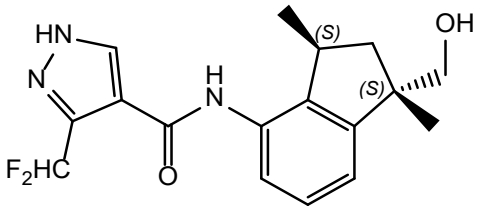
1'-CH_2OH-S-2840B	3-(difluoromethyl)-*N*-((1*S*,3*S*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	
7'OH-S-239	(*R*)-3-(difluoromethyl)-*N*-(7-hydroxy-1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-CH_2OH-S-2840A	3-(difluoromethyl)-*N*-((1*R*,3*S*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-CH_2OH-S-2840A	3-(difluoromethyl)-*N*-((1*S*,3*R*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-CH_2OH-S-2840B	3-(difluoromethyl)-*N*-((1*R*,3*R*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-CH_2OH-S-2840B	3-(difluoromethyl)-*N*-((1*S*,3*S*)-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	

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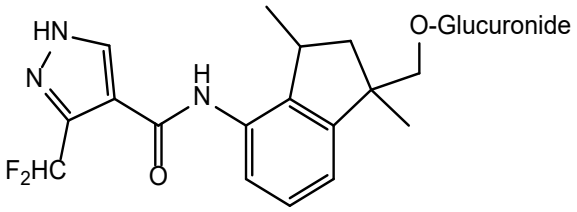
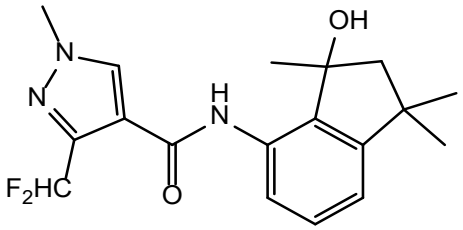
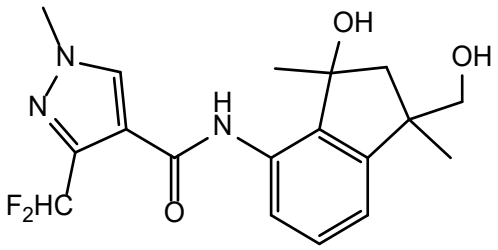
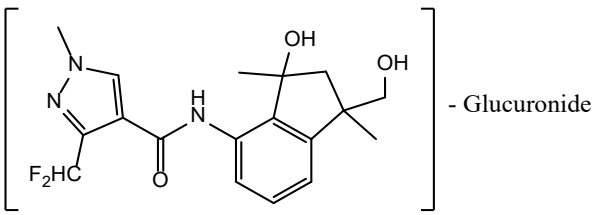
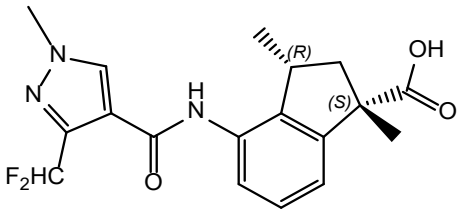
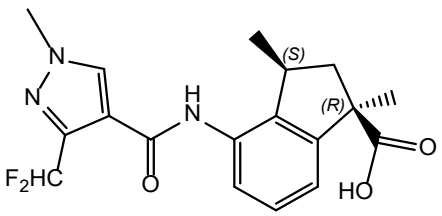
glucuronide of N-des-Me-1'-CH_2OH-S-2840	Glucuronide of *N*-[(1*RS*,3*RS*;1*RS*,3*SR*)-2,3-dihydro-1,3-dimethyl-1-(hydroxymethyl)-1*H*-inden-4-yl)]-3-(difluoromethyl)-1*H*-pyrazole-4-carboxamide	
3'-OH-S-2840	3-(difluoromethyl)-*N*-(3-hydroxy-1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-yl)-1-methyl-1*H*-pyrazole-4-carboxamide	
1'-CH_2OH-3'-OH-S-2840	*N*-[(1*RS*,3*RS*;1*RS*,3*SR*)-2,3-dihydro-1,3-dimethyl-3-hydroxy-1-(hydroxymethyl)-1*H*-inden-4-yl)]-1-methyl-3-(difluoromethyl)-1*H*-pyrazole-4-carboxamide	
glucuronide of 1'-CH_2OH-3'-OH-S-2840	Glucuronide of *N*-[(1*RS*,3*RS*;1*RS*,3*SR*)-2,3-dihydro-1,3-dimethyl-3-hydroxy-1-(hydroxymethyl)-1*H*-inden-4-yl)]-1-methyl-3-(difluoromethyl)-1*H*-pyrazole-4-carboxamide	
1'-COOH-S-2840A	(1*S*,3*R*)-4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-indene-1-carboxylic acid	
1'-COOH-S-2840A	(1*R*,3*S*)-4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-indene-1-carboxylic acid	

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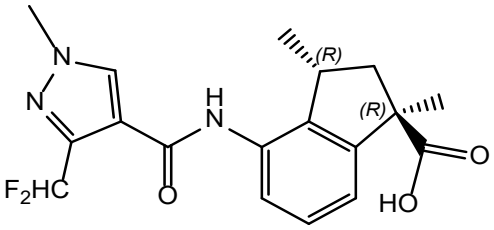
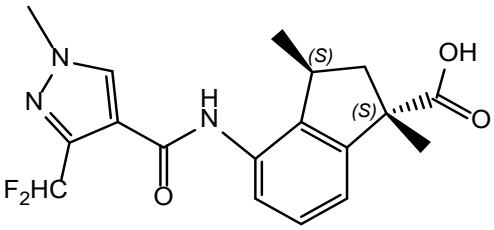
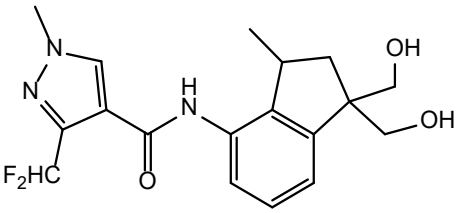
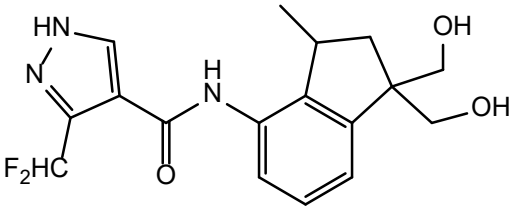
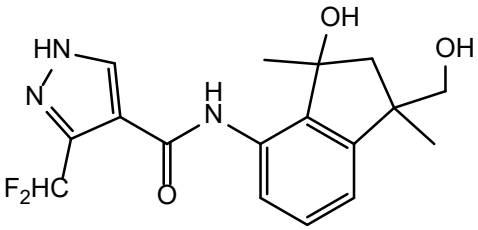
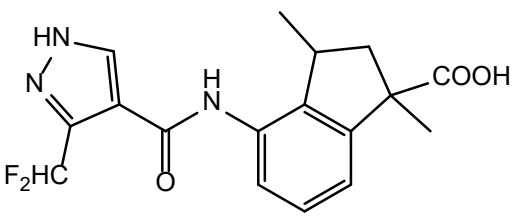
1'-COOH-S-2840B	(1*R*,3*R*)-4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-indene-1-carboxylic acid	
1'-COOH-S-2840B	(1*S*,3*S*)-4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-indene-1-carboxylic acid	
1',1'-bis(CH2OH)-S-2840	*N*-(1,1-bis(hydroxymethyl)-3-methyl-2,3-dihydro-1*H*-inden-4-yl)-3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamide	
N-des-Me-1',1'-bis(CH_2OH)-S-2840	*N*-(1,1-bis(hydroxymethyl)-3-methyl-2,3-dihydro-1*H*-inden-4-yl)-3-(difluoromethyl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-CH_2OH-3'-OH-S-2840	3-(difluoromethyl)-*N*-(3-hydroxy-1-(hydroxymethyl)-1,3-dimethyl-2,3-dihydro-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	
N-des-Me-1'-COOH-S-2840	4-(3-(difluoromethyl)-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-indene-1-carboxylic acid	

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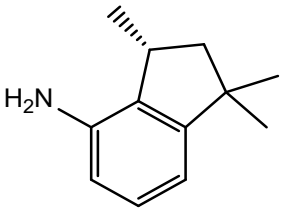
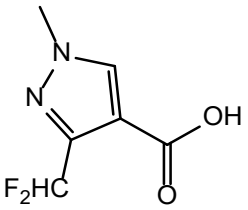
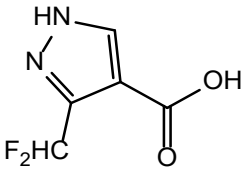
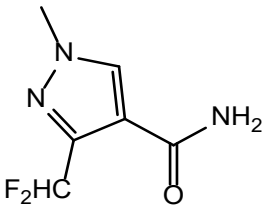
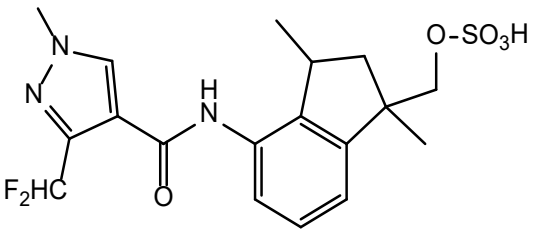
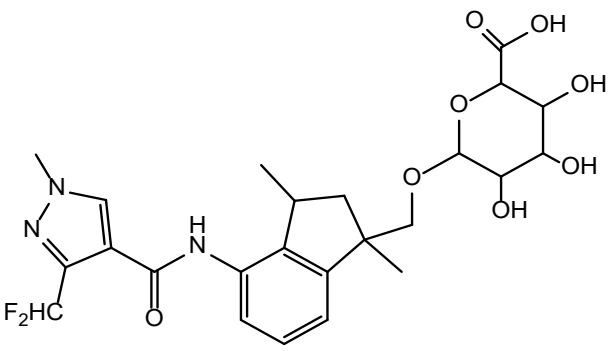
ATMI	(*R*)-1,1,3-trimethyl-2,3-dihydro-1*H*-inden-4-amine	
DFPA	3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxylic acid	
N-des-Me-DFPA	3-(difluoromethyl)-1*H*-pyrazole-4-carboxylic acid	
DFPA-CONH$_2$	3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamide	
1'-CH$_2$OH-S-2840-sulfate	(4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-inden-1-yl)methyl hydrogen sulfate	
Glu-1'-CH$_2$OH-S-2840	6-((4-(3-(difluoromethyl)-1-methyl-1*H*-pyrazole-4-carboxamido)-1,3-dimethyl-2,3-dihydro-1*H*-inden-1-yl)methoxy)-3,4,5-trihydroxytetrahydro-2*H*-pyran-2-carboxylic acid	

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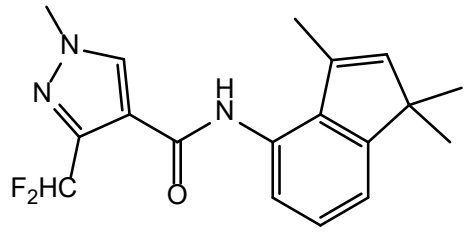
3'-OH-S-2840-dehydrate	3-(difluoromethyl)-1-methyl-*N*-(1,1,3-trimethyl-1*H*-inden-4-yl)-1*H*-pyrazole-4-carboxamide	

* The compound code / trivial name in bold is the name used in the list of endpoints.

Further information

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This publication is available on the HSE website at www.hse.gov.uk/xxx

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