PYDIFLUMETOFEN (309)

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EXPLANATION

Pydiflumetofen was first evaluated for toxicology and residues by JMPR in 2018. An ADI of 0–0.1 mg/kg bw and an ARfD of 0.3 mg/kg bw were established. The residue definition for compliance with the MRL for plant and animal commodities, and dietary risk assessment for plant commodities is pydiflumetofen. The residue definition for dietary risk assessment for animal commodities other than mammalian liver and kidney is the sum of pydiflumetofen and 2,4,6-TCP and its conjugates, expressed as pydiflumetofen and for dietary risk assessment for mammalian liver and kidney is the sum of pydiflumetofen, 2,4,6-TCP and its conjugates, and SYN547897 and its conjugates, expressed as pydiflumetofen. The residue is fat-soluble.

The 2018 JMPR noted that pydiflumetofen residues may be taken up by rotational crops and are very persistent in soil (up to 2380 days DT_{50}). Pydiflumetofen accumulation in soil following subsequent years of treatment is expected. Therefore, the 2018 JMPR concluded that the information available did not allow estimation of pydiflumetofen residues in rotational crops, especially in view of expected plateau soil concentrations being significantly higher than the rate applied in the field rotational crop study available.

The Meeting received information on field soil degradation studies for pydiflumetofen from several regions and field rotational crop studies.

ENVIRONMENTAL FATE IN SOIL

Degradation in soil

Europe

Field studies were performed using pydiflumetofen, as 200 g/L SC formulation, at six European locations (Germany, Italy, Southern France, Northern France, Spain and the United Kingdom). At each site, pydiflumetofen was applied as a single spray application at a nominal rate of 1000 mL product/ha (equivalent to 204 g ai/ha based on analysed content) to bare soil. Immediately after application but before the first soil residue samplings, the treated plots were covered with approximately 5-10 mm of sand to minimise the potential impact of any surface processes (Finger, 2015: S13-02236, 02237, 02238, 02239, 02240, 02241).

Soil samples were taken on the day of treatment (up to a depth of 10 cm), at 3 and 7 days DAA (up to a depth of 30 cm) and at various pre-determined intervals between 14 and 721 DAA (up to a depth of 100 cm). All samples were placed in a deep freeze within 5 hours of sampling and were generally maintained at ≤ -18 °C during storage.

Test soil No. Location		Ohrensen, Lower Saxony, Germany	Stiatico, Emilia Romagna, Italy	Sand, Bas-Rhin, France	Meauzac, Midi Pyrénées, France	Canals, Valencia, Spain	Wilson, Derbyshire, UK
Texture (USDA)		Sandy loam	Clay loam	Silty clay loam	Sandy loam	Sandy loam	Loam
% Sand		77.8	36.0	8.4	65.9	73.5	44.7
% Silt		14.4	28.6	63.9	22.1	9.9	35.4
% Clay		7.9	35.5	27.8	12.0	16.6	20.0
pH	H_2O	6.22	7.22	6.87	6.23	6.27	6.52
	$CaCl_2$	5.68	7.40	7.52	7.48	7.27	6.84
Organic carbon (%)		2.4	3.1	2.1	0.8	3.6	2.9

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Texture (USDA)		Sandy loam	Clay loam	Silty clay loam	Sandy loam	Sandy loam	Loam
CEC (meq/100 g)		5.0	18.4	15.3	6.1	11.4	10.4
Water-holding capacity (%)	pF 2.0	13.7	23.8	23.3	16.6	17.4	23.9
	PF 4.2	2.9	15.0	11.0	4.9	6.8	10.0

At all sites, the 30 cm soil cores were cut into three 10 cm profiles, representing the actual soil layers: 0–10, 10–20 and 20–30 cm. Each layer was removed from the liners and the corresponding layers were bulked to give composite samples for each subplot.

For the 0 to 100 cm soil cores, division of the soil cores varied from site to site. Overall, the soil cores were cut into four profiles, representing the actual soil layers: 0–10, 10–20, 20–30 cm and remaining 30–100 cm. For 0–10, 10–20, 20–30 cm the soil from each layer was removed from the liners and the corresponding layers were bulked to give composite samples for each subplot.

Residues of pydiflumetofen were analysed using modified Syngenta Global Residue Method GRM061.04A. In summary, 10 g of soil were extracted with acetonitrile/0.1 M ammonium acetate (80/20, v/v) aqueous solution by shaking. After centrifugation, the extract was decanted into a plastic flask and the soil was extracted a second time with acetonitrile/0.1% acetic acid (80/20, v/v) in demineralized water. After centrifugation, the supernatant was decanted and collected with the first extract in the centrifuge bottle. This extraction step with acetonitrile/0.1% acetic acid (80/20, v/v) in ultra-pure water was repeated. The collected extracts were mixed well and filtered through piggy backed filter papers into a clean bottle.

Approximately 1 mL was transferred into a HPLC vial and analysed by high performance liquid chromatography with triple quadruple mass spectroscopy determination (LC-MS/MS). For expected residues greater than 5 µg/kg, samples were diluted further and mixed thoroughly. Procedural recoveries ranged from 68% to 118% for pydiflumetofen, with the LOQ of the method at 0.5 µg/kg wet soil across all sites.

Table 1 Residues of pydiflumetofen (g ai/ha) in the individual soil layers

Days after application (DAA)	Germany			
	0-10 cm	10-20 cm	20-30 cm	Total [a]
-1	ND	ND	ND	ND
0	145	NA	NA	145
3	157	ND	NA	157
7	131	<LOQ	NA	131
14	142	<LOQ	NA	142
29	117	ND	NA	117
58	105	ND	NA	105
119	109	<LOQ	NA	109
178	131	ND	NA	131
358	111	<LOQ	NA	111
533	144	<LOQ	NA	144
715	112	<LOQ	NA	112

DAA	Italy						
	0-10 cm	10-20 cm	20-30 cm	30-50 cm	50-70 cm	70-100 cm	Total[1)]
-21	ND	ND	ND	NA	NA	NA	ND
0	153	NA	NA	NA	NA	NA	153
3	106	4	2	NA	NA	NA	112
7	148	3	2	NA	NA	NA	153
14	155	4	2	2	0	NA	163
28	126	2	1	2	1	2	134
58	132	3	2	2	0	NA	139
121	93	0	NA	NA	NA	NA	93
182	119	0	0	NA	NA	NA	119
366	112	2	2	NA	NA	NA	116
542	116	3	1	0	NA	NA	120
716	69	4	2	2	0	NA	77

DAA	Northern France						
	0-10 cm	10-20 cm	20-30 cm	30-50 cm	50-70 cm	70-100 cm	Total [a]
-6	ND	ND	ND	ND	ND	ND	ND
0	116	NA	NA	NA	NA	NA	116
3	120	<LOQ	NA	NA	NA	NA	120
7	157	<LOQ	NA	NA	NA	NA	157
13	133	3	3	2	1	<LOQ	142
27	123	2	1	<LOQ	NA	NA	126
62	132	7	4	2	<LOQ	NA	145
119	137	3	<LOQ	NA	NA	NA	140
177	144	4	1	<LOQ	NA	NA	149
370	142	4	1	<LOQ	NA	NA	147
546	91	5	1	ND	NA	NA	97
721	118	8	1	<LOQ	NA	NA	127

DAA	Southern France				
	0-10 cm	10-20 cm	20-30 cm	30-50 cm	Total [a]
-0#	ND	ND	ND	NA	ND
0	217	NA	NA	NA	217
3	179	2	0	NA	181
7	182	17	13	NA	212
15	93	5	2	2	102
29	111	2	ND	NA	113
59	95	ND	NA	NA	95
121	100	<LOQ	NA	NA	100
172	85	<LOQ	NA	NA	85
366	84	1	<LOQ	NA	85
533	63	1	<LOQ	NA	64
721	46	1	1	ND	48

DAA	Spain			
	0-10 cm	10-20 cm	20-30 cm	Total [a]
-4#	ND	ND	ND	ND
0	189	NA	NA	189
3	231	1	ND	232
7	210	1	<LOQ	211

14	65	<LOQ	NA	65
29	81	1	ND	82
62	110	2	<LOQ	112
119	106	11	ND	117
178	146	<LOQ	NA	146
358	144	2	ND	146
538	80	3	<LOQ	83
714	91	5	<LOQ	96
DAA	United Kingdom			
	0-10 cm	10-20 cm	20-30 cm	Total[1)]
-1#	ND	ND	ND	ND
0	125	NA	NA	125
3	132	ND	NA	132
7	148	<LOQ	NA	148
15	111	1	<LOQ	112
27	105	1	ND	106
59	132	1	ND	133
118	108	<LOQ	NA	108
182	154	1	<LOQ	155
372	132	<LOQ	<LOQ	132
539	119	1	<LOQ	120
718	85	2	<LOQ	87

ND: Residues are below the limit of detection (0.15 µg/kg wet weight soil)

NA: Not analysed (only 0-10 cm cores taken at 0 DAA and 20-30 depths not analysed as the 10-20 cm soil layer had residues below the LOQ of the method, 0.5 µg/kg wet soil weight)

Residue value of 0 g ai/ha was given for analysed soil layers where the wet weight soil residue was <LOQ (0.5 µg/kg)

[a] The total residue is summed from the individual soil layer unrounded residue values

The soil samples were analysed for residues of pydiflumetofen at each sampling point. Pydiflumetofen was found to remain mostly in the top soil layer (0 to 10 cm) with initial concentrations in the range of 116 to 189 g ai/ha, gradually declining to a range of 46 to 118 g ai/ha at the end of the study periods. At lower layers, levels of parent were in the range of 17 g ai/ha to not detected at 10–20 cm, dropping to 13 g ai /ha not detected at 20–30 cm. At one site (Germany) no parent was detected below 10 cm depth. At the end of the sampling period, after approximately two years, total soil residues of pydiflumetofen at the six trial locations had dissipated by 38% to 76% based on the nominal application rate.

At each site, chiral analysis was performed on 0 DAA and 533 to 546 DAA (0–10 cm depth) soil samples. At all sites, no significant change in the enantiomer ratio of pydiflumetofen was observed between these two time points. The enantiomer ratio in soil samples taken immediately after application was found to range from 0.95 to 1.03 and in sample taken 533 to 546 days after application the ratio range was 0.97 to 1.08.

Canada study 1

A terrestrial field dissipation study was conducted from 2013 to 2015 to determine the field persistence and leaching behaviour of pydiflumetofen when applied to bare loam soil in Taber, Alberta, Canada (Harrington, 2015: TK0121181). Two broadcast spray applications of pydiflumetofen SC formulation (200 g/L) were made to bare soil at a target rate of 220 g ai/ha per application, using a calibrated tractor-mounted boom sprayer.

Parameter	Depth range (cm)					
	0-10	10-25	25-40	40-55	55-70	70-100
Texture	Loam	Loam	Loam	Loam	Clay loam	Clay loam
Sand (%)	47.4	40.2	35.9	31.7	30.9	39.9
Silt (%)	29.7	33.5	37.4	41.7	37.2	31.2
Clay (%)	22.9	26.2	26.6	26.6	31.9	28.8
Organic Carbon (%)	1.50	1.10	0.70	0.50	0.50	0.40
Organic Matter (%)[a]	2.65	1.86	1.13	0.86	0.84	< 0.70
Cation Exchange Capacity (meq/100g)	18.0	15.0	14.1	13.0	15.0	13.1
pH	8.03	8.25	8.35	8.51	8.70	8.46

[a] Organic matter (%) = Organic Carbon (%) × 1.7

Soil cores, to a depth of 100 cm, were obtained prior to the first test item application (-15 DA1A), then on 16 subsequent days between 0 and 703 DA1A. Residues of pydiflumetofen in soil were determined according to method GRM061.04A and were analysed using LC-MS/MS. The LOQ was 0.5 µg/kg. Procedural recoveries (mean ± standard deviation) for analysis of pydiflumetofen in the AMD and soil samples were 100.3 ± 2.4% (n = 6) and 86.3 ± 7.0% (n = 49), respectively.

Application rates were verified by the collection of samples deposited onto application monitoring devices (AMD, thick cellulose filter paper with an aluminium foil backing) placed onto the soil surface prior to application. The mean calculated application rates of pydiflumetofen derived from the AMD samples were 206 ± 34 g ai/ha and 232 ± 24 g ai/ha for the first and second applications, respectively.

Table 2 Residues of pydiflumetofen in treated soil with depth (values are mean of treated plot replicates expressed on a dry weight basis)

Days After First Application (DA1A)	Mean Residues Found (µg/kg, dry weight) [a]					
	0-10 cm	10-25 cm	25-40 cm	40-55 cm	55-70 cm	70-100 cm
-15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
0	130	NS	NS	NS	NS	NS
3	115	0.93	< 0.5	< 0.5	< 0.5	< 0.5
6	63	0.52	< 0.5	< 0.5	< 0.5	< 0.5
7	162	NS	NS	NS	NS	NS
10	173	8.8	< 0.5	< 0.5	< 0.5	< 0.5
14	178	2.7	< 0.5	< 0.5	< 0.5	< 0.5
21	155	1.7	< 0.5	< 0.5	< 0.5	< 0.5
38	130	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
65	129	2.0	0.54	< 0.5	< 0.5	< 0.5
113	152	1.5	0.53	< 0.5	< 0.5	< 0.5
310	71	2.1	< 0.5	< 0.5	< 0.5	< 0.5
358	60	2.3	0.59	< 0.5	< 0.5	< 0.5
412	93.7	1.2	< 0.5	< 0.5	< 0.5	< 0.5
485	39	1.0	< 0.5	< 0.5	< 0.5	< 0.5
667	73	1.8	< 0.5	< 0.5	< 0.5	< 0.5
696	52	1.3	< 0.5	< 0.5	< 0.5	< 0.5

NS: not sampled

[a] Mean of residues from treated plot replicates A, B and C. In some instances, means are based on more than three data points, i.e., repeat analysis of individual replicate samples. Mean residues were calculated in the 10-25 and 25-40 cm depths by treating any values equal or below LOQ values.

No residues of pydiflumetofen were detected in any control samples at or above the LOQ. Dissipation of pydiflumetofen residues from the treated plot occurred steadily over the course of the study, declining in the surface layer (0-10 cm) from 162 µg/kg (mean) immediately after the second application (7 DA1A) to 52 µg/kg (mean) on 696 DA1A. Pydiflumetofen residues were primarily found in the 0-10 cm soil layer. Residues in the 10-25 cm depths were detected consistently over the study period, averaging around 1-2 µg/kg. There were three detections of pydiflumetofen above LOQ in the 25-40 cm soil layer, all were < 1 µg/kg, and no residue was observed below this depth over the course of the trial (696 days).

Dissipation of pydiflumetofen residues occurred slowly but steadily over the course of the study. Kinetic analysis of the pydiflumetofen residue found in the top three depth horizons A (0-40 cm) of the treated bare soil plot using Single First Order (SFO), Double First Order in Parallel (DFOP) and Indeterminate Order Rate Equation (IORE) fitting procedure returned DT_{50} values of 274-356 days.

Canada study 2

A terrestrial field dissipation study was conducted from 2013 to 2014 determine the mobility and persistence potential of pydiflumetofen in a sandy loam soil when applied to Kentucky bluegrass in Queens County, Prince Edward Island, Canada (Moore, *et al.*, 2015: TK0174758). Only the bare soil plot data is summarized, as cropped plots are not suitable for use in a soil DT_{50} derivation.

Pydiflumetofen SC formulation (200 g/L) was applied to the treated plot at a rate of 220 g ai/ha using a calibrated tractor-mounted boom sprayer. Applications were timed to approximate typical summer disease control in cold season turf grass species. Trial plots were periodically treated with herbicide (glyphosate, diquat) to control weed growth.

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-45	45-60	60-75	75-90
Texture (USDA)		Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam
Sand (%)		62	60	63	65	69	59	56
Silt (%)		26	28	23	21	19	25	30
Clay (%)		12	12	14	14	12	16	14
Organic Matter (%)		3.3	3.0	2.1	0.88	0.43	0.07	0.02
Cation Exchange Capacity (meq/100g)		8.0	7.8	6.5	5.9	4.9	5.2	4.9
pH		6.4	6.3	5.4	5.2	5.2	5.2	5.0
Water-Holding Capacity (%)	1/3 Bar	22.8	23.5	19.2	16.4	11.3	14.1	16.6
	15 Bar	9.0	9.1	9.1	8.2	6.1	6.6	6.3

Actual application rates were verified using fifteen 15 cm diameter filter papers, placed in glass petri-dishes on the soil surface, which were collected immediately after each application. Treated plots were sampled to a soil depth of 90 cm, prior to the initial application (-2 day), 0 DA1A (immediately after the first application), 3 and 6 days after the first application (DA1A), 0 DA2A (immediately after the second application) and at ten different sampling intervals between 3 and 456 days after the second application (DA2A). Soils were collected from the control plot prior to application (-2 day), 3 days after the first application (DA1A) and 3, 91 and 371 days after the second application (DA2A).

Soil samples were analysed for the parent substance, pydiflumetofen, only, using methods GRM061.04A. Residues of pydiflumetofen in the soil extracts were analysed by LC-MS/MS. The LOQ for pydiflumetofen in soil was 0.5 µg/kg. Mean procedural recoveries and relative standard

deviation (RSD) for the overall recovery of pydiflumetofen from soil samples were 97 ± 11% (n = 16) and 91.8 ± 12.4% (n = 28), for samples analysed at ALS and GPL, respectively. Application verification samples showed that 87.5 ± 28.7% (n = 15) and 84.8 ± 11.9% (n = 15) of target rate was achieved in the bare soil plot for the first (0 DA1A) and second (0 DA2A) applications, respectively.

Table 3 Residues of pydiflumetofen in soil with depth – Treated bare soil plot (mean values)

DA1A [c]	DA2A [c]	Pydiflumetofen, Mean Residues Found (µg/kg) [a b)]						
		0-7.5 cm	7.5-15 cm	15-30 cm	30-45 cm	45-60 cm	60-75 cm	75-90 cm
-2	-9	--	--	< 0.5	< 0.5	NS	NS	NS
0	-7	150	7.2	NS	NS	NS	NS	NS
3	-4	151	12.7	0.843	< 0.5	< 0.5	--	--
6	-1	179	12.1	0.569	< 0.5	< 0.5	--	--
7	0	335	36.3	0.813	< 0.5	< 0.5	--	--
10	3	355	8.0	< 0.5	< 0.5	--	--	--
14	7	382	6.87	0.648	< 0.5	< 0.5	--	--
22	15	424	4.0	0.529	< 0.5	--	--	--
36	29	412	1.69	< 0.5	< 0.5	--	--	--
71	64	404	3.78	< 0.5	< 0.5	--	--	--
98	91	311	2.43	0.646	< 0.5	< 0.5	--	--
129	122	225	3.44	0.783	< 0.5	< 0.5	1.01	--
319	312	254	8.72	0.935	0.602	< 0.5	< 0.5	--
378	371	236	4.24	3.02	< 0.5	< 0.5	< 0.5	--
463	456	198	3.07	< 0.5	< 0.5	< 0.5	4.62	--

NS = not sampled, -- = not analysed

[a] Mean result of all individual replicate analyses for a given sampling event presented. Residue results reported as dry weight. To calculate the mean pydiflumetofen detected for a given sampling event any individual replicate results that were < 0.5 µg/kg (<LOQ) were reported as 0.5 µg/kg if at least one replicate was > LOQ.

[b] Following significant amounts of snow followed by heavy rainfall a number of erosion channels were observed within the bare soil treated plot on May 6, 2014. The last soil sampling event for which data were generated for Replicate C is at 122 DA2A sampling event.

[c] DA1A = days after first application; DA2A = days after second application

No residues of pydiflumetofen were detected in any controls at or above the limit of detection (LOD). In the treated bare soil plot, pydiflumetofen dissipated steadily over the trial period. Maximum mean pydiflumetofen residues were 424 µg/kg in the 0-7.5 cm soil depth at 15 DA2A, which dissipated to 198 µg/kg by the end of the trial (456 DA2A). Quantifiable residues of pydiflumetofen were confined to the 0-30 cm soil depth with minor exceptions; at 312 DA2A when the mean residue in the 30-45 cm layer was slightly above the LOQ (0.602 µg/kg), and on 122 DA2A and 456 DA2A when mean residues of 1.01 and 4.62 µg/kg, respectively, were observed at the 60-75 cm soil depth.

In the treated bare soil plot, the calculated SFO DT_{50}, DT_{75}, and DT_{90} of pydiflumetofen g/ha found in soil (0-90 cm) following the second test substance application were 394, 787, and 1310 days, respectively.

USA study 1

A terrestrial field dissipation study was conducted in 2012-2014 to determine the mobility and persistence of pydiflumetofen in a bare loamy sand soil when applied at the typical fungicide application timing for fresh market tomato in Madera County, California, USA (Jacobson, *et al*, 2015: TK0121177). Two broadcast spray applications of pydiflumetofen SC formulation (200 g/L) were

made to bare soil at a target rate of 220 g ai/ha per application, using a calibrated tractor-mounted boom sprayer.

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-46	46-61	61-76	76-91
Texture (USDA)		Loamy sand	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Sandy loam	Sandy loam
Sand (%)		82	82	80	78	80	78	74
Silt (%)		12	12	12	13	10	10	10
Clay (%)		6	6	8	9	10	12	16
Organic Matter (%)		0.77	0.59	0.36	0.23	0.18	0.23	0.14
Cation Exchange Capacity (meq/100g)		6.6	6.2	6.0	6.1	7.3	8.6	11.6
pH		7.5	7.4	7.5	6.8	7.6	7.3	7.5
Water-Holding Capacity (%)	1/3 Bar	6.1	5.9	6.1	6.0	6.2	7.3	10.8
	15 Bar	3.7	3.4	3.6	3.7	4.1	5.0	7.4

Actual application rates were verified using three metal pans (area 754.84 cm^2), each containing a pre-weighed soil sample, placed in each replicate of the treated bare soil plot and collected immediately after application. The treated plot was sampled to a depth of 91.4 cm prior to the first application (-4 days), 0 DA1A (immediately after the first application), 3, 7 and 13 days after the first application (DA1A), 0 DA2A (immediately after the second application) and at fourteen different sampling intervals between 1 and 721 days after the second application (DA2A). Control plots were sampled prior to application (-4 days), 7 days after the first application (DA1A), and at nine sampling intervals between 7 and 721 days after the second application (DA2A).

Soil samples were extracted and analysed according to method GRM061.04A. Pydiflumetofen residues were quantified by LC-MS/MS, with a LOQ of 0.5 µg/kg. Mean procedural recoveries and relative standard deviation (RSD) for the overall recovery of pydiflumetofen from soil samples were 86 ± 11% (n = 42) and 93 ± 4.3% (n = 14), for samples analysed at MPI and NCL, respectively. Application verification samples showed 93 ± 6.7% and 89 ± 18% of target rate was achieved in the treated plot for the first (0 DA1A) and second (0 DA2A) applications, respectively.

Table 4 Residues of pydiflumetofen in soil with depth – Treated bare soil plot (mean values)

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]						
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm	61-76 cm	76-91 cm
-4	-4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--	--
0	0	180	< 0.5	< 0.5	--	--	--	--
3	3	156	< 0.5	< 0.5	--	--	--	--
7	7	143	0.51[c]	< 0.5	<0 .5	< 0.5	--	--
13	13	136	< 0.5	0.61[c]	< 0.5	< 0.5	--	--
0	14	305	< 0.5	< 0.5	--	--	--	--
1	15	271	< 0.5	< 0.5	--	--	--	--
3	17	282	< 0.5	< 0.5	--	--	--	--
7	21	244	< 0.5	< 0.5	--	--	--	--
14	28	296	< 0.5	< 0.5	--	--	--	--
30	44	272	< 0.5	< 0.5	--	--	--	--
59	73	260	1.1[d]	0.52[c]	< 0.5	< 0.5	--	--
90	104	196	< 0.5	< 0.5	< 0.5	< 0.5	--	--
120	134	199	1.1[c]	0.57[c]	< 0.5	< 0.5	--	--
182	196	218	14	1.6[d]	< 0.5	< 0.5	--	--

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]						
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm	61-76 cm	76-91 cm
275	289	196	42	1.1[d]	< 0.5	< 0.5	--	--
358	372	99	53	3.6	1.0[d]	0.50[c]	< 0.5	--
477	491	81	26	2.1[c]	0.53[c]	0.84[d]	0.97[c]	< 0.5
598	612	95	57	4.6	0.86[d]	< 0.5	< 0.5	--
721	735	48	41	9.8	4.7	1.3[a)]	< 0.5	--

-- = not analysed

[a] Residues are presented on a dry weight basis. Mean of residues from replicate treated plots-A, B and C; however, in some instances means are based on more than three data points, i.e., repeat analysis of individual replicate samples.

[b] DAPA = days after previous application; DA1A = days after first application.

[c] Only one of the replicates had residues detected > LOQ.

[d] Only two of the replicates had residues detected > LOQ.

No residues of pydiflumetofen were detected in control samples at or above the limit of detection (LOD, defined as 1/2 LOQ), with the exception of 360 DA2A and 480 DA2A, 0-7.6 cm samples in which apparent residues of 0.21 and 0.37 µg/kg (mean of duplicate analysis) were observed, respectively.

Pydiflumetofen dissipated from treated bare soil by approximately 55%, over approximately 24 months following the second application. Pydiflumetofen residues remained predominately in the surface 15 cm of soil for the study duration. Consistent low-level detections in the 15-30 cm soil depth started late in the study, approximately 6 months after the second application. Low-level residues were also found approximately 12 and 15 months after the second application as deep as the 30-46 cm and 46-61 cm soil horizons (maximum 4.7 µg/kg, 721 DAPA, 30-46 cm). Only one quantifiable (i.e., ≥ LOQ) residue of pydiflumetofen was found below the 46-61 cm soil depth increment (477 DAPA, Rep A, 61-76 cm depth, 0.97 µg/kg).

0 DAPA – 721 DAPA pydiflumetofen residues (µg/kg) found in the top 76 cm of the soil were converted to total pydiflumetofen g/ha found, in order to perform non-linear regression analysis to calculate a DT_{50}, DT_{75} and DT_{90}. The calculated pydiflumetofen SFO ($r^2 = 0.62$, $\chi^2 = 10\%$) DT_{50}, DT_{75} and DT_{90} after the second application was 666 days, 1333 days and 2210 days, respectively.

USA study 2

A terrestrial field dissipation study was conducted from 2013 to 2015 to determine the persistence and leaching behaviour of pydiflumetofen when applied to bare silty clay loam soil in Jefferson County, Iowa, USA, at a timing typical for fungal disease control in soya beans (Ghebremichael, 2015: TK0103779). Two broadcast spray applications of pydiflumetofen SC formulation (200 g/L) were made to bare soil at a rate of 220 g ai/ha, using a calibrated, tractor-mounted boom sprayer.

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-46	46-61	61-76	76-91
Texture (USDA)		Silty clay loam	Clay loam	Silty clay loam	Clay loam	Clay loam	Clay loam	Clay loam
Sand (%)		16	20	12	30	30	34	44
Silt (%)		53	49	53	37	35	29	25
Clay (%)		31	31	35	33	35	37	31
Organic Matter (%)		3.0	3.0	2.6	1.3	0.35	0.72	0.43
Cation Exchange Capacity (meq/100g)		19.2	19.7	19.7	21.4	26.9	29.2	29.2
pH		6.8	6.7	6.3	5.8	6.1	5.7	5.9
Water-Holding	1/3 Bar	28.3	29.0	31.0	33.7	38.5	39.5	38.7

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-46	46-61	61-76	76-91
Capacity (%)	15 Bar	15.0	14.2	16.7	22.9	24.5	26.2	26.1

Soil cores, to a depth of 91 cm, were obtained from treated plots prior to the first application (-1 day), 0 DA1A (immediately after the first application), 3 and 6 days after the first application (DA1A), 0 DA2A (immediately after the second application) and at eleven different sampling intervals between 3 and 595 days after the second application (DA2A). Control plots were sampled prior to the first application (-1 day), 6 days after the first application (DA1A), and at seven sampling intervals between 7 and 595 days after the second application (DA2A). Cores were cut into 7.6- or 15 cm segments down to 91 cm, and soils from corresponding depths were combined for each replicate plot.

Residues of pydiflumetofen in soil were determined according to method GRM061.04A and were analysed using LC-MS/MS. The LOQ was 0.5 µg/kg. Mean procedural recoveries and relative standard deviation (RSD) for soil samples were 103 ± 13.2% (n = 91).

Actual application rates were verified using fifteen 15 cm diameter filter papers, placed in glass petri-dishes on the soil surface, and three metal pans (23.50 × 33.66 cm), each containing a pre-weighed soil sample, placed in each replicate of the treated bare soil plot. The application verification filter paper samples showed 91 ± 12.4% (n = 15) and 104 ± 12.2% (n = 15) of target rate was achieved for the first (0 DA1A) and second (0 DA2A) applications, respectively. The percent of theoretical application rate found in the soil pan samples were 75 ± 8.53% and 87 ± 9.71% for the first (0 DA1A) and second (0 DA2A) applications, respectively.

Table 5 Residues of pydiflumetofen in soil with depth – Treated bare soil plot (mean values)

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]						
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm	61-76 cm	76-91 cm
-1	-1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--	--
0	0	334	NS	NS	NS	NS	NS	NS
3	3	338	0.56[a)]	< 0.5	< 0.5	--	--	--
6	6	274	3.5	< 0.5	< 0.5	--	--	--
0	6	557	11	< 0.5	< 0.5	--	--	--
3	9	593	0.51[a)]	< 0.5	< 0.5	--	--	--
7	13	549	7.2	< 0.5	< 0.5	--	--	--
14	20	451	3.1	< 0.5	< 0.5	--	--	--
28	34	388	4.9	< 0.5	< 0.5	--	--	--
59	65	258	5.0	< 0.5	< 0.5	--	--	--
91	97	240	3.9	< 0.5	< 0.5	--	--	--
119	125	283	8.8	< 0.5	< 0.5	--	--	--
267	273	131	1.1[d]	< 0.5	< 0.5	--	--	--
359	365	18	< 0.5	< 0.5	< 0.5	--	--	--
450	456	65	2.3[d]	< 0.5	--	--	--	--
595	601	29	0.80[d]	< 0.5	< 0.5	--	--	--

-- = not analysed

[a] Residues are presented on a dry weight basis. Mean of residues from replicate treated plots-A, B and C; however, in some instances means are based on more than three data points, i.e., repeat analysis of individual replicate samples.

[b] DAPA = days after previous application; DA1A = days after first application.

[c] Only one of the replicates had residues detected > LOQ.

No residues of pydiflumetofen were detected in any controls at or above the limit of detection (LOD, defined as 1/2 LOQ). In the treated plot, pydiflumetofen residues dissipated steadily over 595 days, declining to approximately 6% of the levels observed immediately after the second application. Pydiflumetofen remained in the surface 15 cm for the study duration. No quantifiable (*i.e.* ≥ LOQ) residues of pydiflumetofen were found below the 7.6-15 cm soil horizon.

Three DAPA (peak value after application 2) – 595 DAPA residues (µg/kg) found in the top 15 cm of the soil were converted to total g/ha found in order to conduct non-linear regression analysis to calculate a DT_{50}, DT_{75} and DT_{90}. The SFO kinetics model gave an acceptable fit for the graphical fit plot, residual plot, determined rate constant (k), along with goodness of fit statistics based on the FOCUS kinetics guidance. The FOMC and DFOP models provided minimum improvement to visual fit and random residual pattern compared to SFO, Thus SFO kinetic model was selected to represent this data set. The calculated SFO ($r^2 = 0.91$, $\chi^2 = 14.8$) DT_{50}, DT_{75} and DT_{90} of pydiflumetofen after the second and final application was 84 days, 168 days, and 279 days, respectively.

USA study 3

A terrestrial field dissipation study was conducted in 2013-2015 to determine the mobility and persistence potential of pydiflumetofen in a sand soil when applied to winter wheat (*Triticum aestivum L.*, var. 'Stephens') in the North western United States (Grant County, Washington) (Wiepke, 2015: TK0121180). Only the bare soil plot data is summarized, as cropped plots are not suitable for use in a soil DT_{50} derivation. Pydiflumetofen SC formulation (200 g/L) was applied to the treated plot at a rate of 220 g ai/ha, using a calibrated, tractor-mounted boom sprayer. The first application was timed to occur at BBCH 37-41 (Feekes 8.0 to 10.0) of a winter wheat crop.

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-46	46-61	61-76	76-91
Texture (USDA)		Sand	Sand	Sand	Sand	Sand	Loamy sand	Sandy loam
Sand (%)		90	90	90	90	86	78	68
Silt (%)		10	10	10	10	14	20	30
Clay (%)		0	0	0	0	0	2	2
Organic Matter (%)		0.47	0.47	0.23	0.15	0.19	0.19	0.10
Cation Exchange Capacity (meq/100g)		8.4	8.5	8.7	9.0	9.5	8.8	11.0
pH		7.9	8.1	8.3	8.4	8.3	8.5	8.6
Water-Holding Capacity (%)	1/3 Bar	8.1	7.2	6.8	7.3	8.1	11.0	14.3
	15 Bar	3.8	3.8	4.0	3.9	4.0	3.9	4.0

The treated plot was sampled to a soil depth of 91 cm, prior to the first application (-4 day), 0 DA1A (immediately after the first application), 3 and 6 days after the first application (DA1A), 0 DA2A (immediately after the second application) and at thirteen different sampling intervals between 3 and 720 days after the second application (DA2A). The control plot was sampled prior to the first application (-4 day), 6 days after the first application (DA1A), and at ten sampling intervals between 7 and 720 days after the second application (DA2A).

Soil samples were analysed for the parent substance, pydiflumetofen, only, using methods GRM061.04A. Residues of pydiflumetofen in the soil extracts were analysed by LC-MS/MS. The LOQ for pydiflumetofen in soil was 0.5 µg/kg. Mean procedural recoveries and relative standard deviation (RSD) for soil samples from bare soil were 91 ± 16% (n = 33). The application verification samples showed 108 ± 8.36% and 93 ± 8.92% of target rate was achieved for the first (0 DA1A) and second (0 DA2A) applications, respectively.

Table 6 Residues of pydiflumetofen in soil with depth – Treated bare soil plot (mean values)

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]				
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm
-4	-4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
0	0	200	NS	NS	NS	NS
3	3	186	0.98[d]	< 0.50	< 0.50	--
6	6	164	< 0.50	< 0.50	< 0.50	--
0	7	337	0.86[d]	< 0.50	< 0.50	--
3	10	311	0.63[d]	0.51[c]	< 0.50	< 0.50
7	14	339	0.77[d]	< 0.50	< 0.50	--
14	21	317	< 0.50	< 0.50	< 0.50	--
30	37	293	0.69[b]	< 0.50	< 0.50	--
59	66	201	35	< 0.50	< 0.50	--
90	97	225	18[c]	< 0.50	< 0.50	--
120	127	212	21[d]	< 0.50	< 0.50	--
181	188	171	34[c]	< 0.50	< 0.50	< 0.50
272	279	195	4.d)	0.61[c]	< 0.50	< 0.50
360	367	174	1.3[c]	< 0.50	< 0.50	--
479	486	143	60	0.64[c]	< 0.50	< 0.50
603	610	103	52	3.8[c]	< 0.50	< 0.50

NS = not sampled, -- = not analysed

[a] Residues are presented on a dry weight basis. Mean of residues from replicate treated plots-A, B and C; however, in some instances means are based on more than three data points, i.e., repeat analysis of individual replicate samples.

[b] DAPA = days after previous application; DA1A = days after first application.

[c] One replicate sample was ≥ LOQ.

[d] Two replicate samples were ≥ LOQ.

No residues of pydiflumetofen were detected in any controls at or above the limit of detection (LOD = 1/2 LOQ). Pydiflumetofen dissipated from treated bare soil, declining by approximately 53%, over approximately 20 months following the second application. In the bare soil plot, pydiflumetofen remained predominantly in the first 15 cm of soil throughout the trial duration. No quantifiable (>LOQ) residue of pydiflumetofen was found below the 15-30 cm and 30-46 cm soil depth increments in the treated bare soil plot.

Dissipation of pydiflumetofen in the treated bare soil plot was slow. Residues of pydiflumetofen were at ~47% of the second application pydiflumetofen g/ha found at ~20 months after the second application. Pydiflumetofen residues (0 DAPA – 603 DAPA, µg/kg) found in the top 30 cm were converted to total pydiflumetofen g/ha to perform non-linear regression analysis to calculate DT_{50}, DT_{75} and/or DT_{90} values. The biphasic model DFOP provided the best fit. Calculated pydiflumetofen DFOP ($r^2 = 0.6991$, $\chi^2 = 7.3\%$) DT_{50} and DT_{90} values after the second application were 697 and 4650 days, respectively.

USA study 4

A terrestrial field dissipation study was conducted from 2012 to 2014 to determine the mobility and persistence potential of pydiflumetofen when applied to peanuts in Tift County, Georgia, USA (Jacobson, 2015: TK0121176). Only the bare soil plot data is summarized, as cropped plots are not suitable for use in a soil DT_{50} derivation. Four applications of pydiflumetofen SC formulation (200 g/L) were made to the treated plots at a rate of 110 g ai/ha per application using a calibrated tractor-mounted boom sprayer. Applications were timed to approximate the typical start of fungicide

applications in peanuts in South eastern USA. Bare soil was maintained by the application of herbicides.

Parameter		Depth range (cm)						
		0-7.6	7.6-15	15-30	30-46	46-61	61-76	76-91
Texture (USDA)		Sand	Sand	Sand	Sandy loam	Sandy clay loam	Sandy clay loam	Sandy clay loam
Sand (%)		90	89	89	77	71	63	63
Silt (%)		7	8	8	10	8	10	8
Clay (%)		3	3	3	13	21	27	29
Organic Matter (%)		0.82	0.69	0.43	0.26	0.30	0.30	0.22
Cation Exchange Capacity (meq/100g)		8.4	8.5	8.7	9.0	9.5	8.8	11.0
pH		7.2	6.8	6.2	6.1	5.7	5.3	5.3
Water-Holding Capacity (%)	1/3 Bar	4.6	4.9	5.1	8.3	13.0	15.8	17.5
	15 Bar	2.1	2.1	2.2	4.9	8.6	10.5	12.7

Soil cores were collected to a total depth of 91 cm from the treated bare soil and control plots prior to the first application (-1 day), immediately after each application (0 DA1A, 0 DA2A, 0 DA3A, 0 DA4A), 3 and 6 days after the first, second and third applications (DA1A, DA2A and DA3A) and at 15 different sampling intervals between 1 and 723 days after the fourth application (DA4A).

Soil samples were analysed for the parent substance, pydiflumetofen, only, using method GRM061.04A. Pydiflumetofen residues were quantified by LC-MS/MS, with a LOQ of 0.5 µg/kg. Mean procedural recoveries and relative standard deviation (RSD) for the overall recovery from bare soil samples were 98 ± 12% (n = 42) and 101 ± 10.8% (n = 18) for the samples sets analysed at ALS and ADPEN, respectively.

Based on total soil residues, actual application rates achieved were 79%, 99%, 90% and 105% of the target rate (110 g ai/ha) after the first, second, third (measured at 3 DA3A) and fourth applications, respectively.

Table 7 Residues of pydiflumetofen in soil with depth – Treated bare soil plot (mean values)

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]				
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm
-1	-1	< 0.5	< 0.50	< 0.50	< 0.50	< 0.50
0	0	72	< 0.50	< 0.50	--	--
3	3	65	< 0.50	< 0.50	--	--
6	6	49	0.51	< 0.50	--	--
0	7	137	< 0.50	< 0.50	--	--
3	10	95	< 0.50	< 0.50	--	--
6	13	104	< 0.50	< 0.50	--	--
0	14	162	< 0.50	< 0.50	--	--
3	17	170	< 0.50	< 0.50	--	--
6	20	143	0.52	< 0.50	< 0.50	--
0	21	240	< 0.50	< 0.50	< 0.50	--
1	22	224	0.62	< 0.50	< 0.50	--
3	24	189	< 0.50	0.73	< 0.50	< 0.50
7	28	230	< 0.50	< 0.50	< 0.50	< 0.50
14	35	224	< 0.50	< 0.50	--	--
30	51	192	< 0.50	< 0.50	--	--
58	79	179	< 0.50	< 0.50	--	--

DAPA [b]	DA1A[b]	Pydiflumetofen, Mean Residues Found (µg/kg) [a]				
		0-7.6 cm	7.6-15 cm	15-30 cm	30-46 cm	46-61 cm
86	107	171	< 0.50	< 0.50	--	--
120	141	161	< 0.50	< 0.50	--	--
181	202	167	0.66	< 0.50	< 0.50	--
268	289	120	< 0.50	< 0.50	< 0.50	--
363	384	73	1.2	< 0.50	< 0.50	--
479	500	76	1.4	< 0.50	< 0.50	--
598	619	69	0.87	< 0.50	< 0.50	--
723	744	79	2.6	< 0.50	< 0.50	--

-- = not analysed

[a] Residues are presented on a dry weight basis. Mean of residues from replicate treated plots-A, B and C; however, in some instances means are based on more than three data points, i.e., repeat analysis of individual replicate samples.

[b] DAPA = days after previous application; DA1A = days after first application.

No residues of pydiflumetofen were detected in control samples at or above the limit of detection, with the exception of one sample, which was attributed to laboratory contamination. Pydiflumetofen dissipated gradually in treated bare soil over approximately 24 months. By the end of the trial, resides of pydiflumetofen were at approximately 31% of the levels observed after the fourth (last) application. Pydiflumetofen remained predominantly in the surface 7.6 cm of soil for the study duration (744 days). Residues at the 7.6-15 cm depth were typically <1 to 4% of the residue levels found at the 0-7.6 cm depth. Pydiflumetofen was detected at quantifiable levels (*i.e.* ≥ LOQ) at only one sampling interval at the 15-30 cm depth soil layer (0.73 µg/kg at 3 DA4A) and no quantifiable residues of pydiflumetofen were observed below the 15-30 cm depth.

Dissipation of pydiflumetofen in the bare soil plot was slow. Pydiflumetofen residues from 0 DAPA – 723 DAPA found in the top 30 cm of the soil were converted from µg/kg to total pydiflumetofen g/ha found, in order to perform non-linear regression analysis to calculate a DT_{50}, DT_{75} and DT_{90}. The calculated pydiflumetofen SFO ($r^2 = 0.87$, $\chi^2 = 8.6\%$) DT_{50}, DT_{75} and DT_{90} after the fourth application were 312 days, 623 days and 1,040 days, respectively.

Korea

A terrestrial field dissipation study was conducted at two upland sites in South Korea (Suwon, Kyeonggi-do and BuYeo, Chungcheongham-do). At both sites, pydiflumetofen 18.35% SC formulation was applied to bare soil at two application rates: 0.2 kg ai/ha (application X1) and 0.4 kg ai/ha (application X2). Single applications at each rate were applied to separate plots (Kim, 2017: SE-R 16-098).

Test soil No. Location	Suwon, Kyeonggi-do	BuYeo, Chungcheongham-do
Texture	Sandy loam	Sandy loam
% Sand	57.1	73.6
% Silt	36.1	17.0
% Clay	6.8	9.4
pH	4.3	7.7
Organic matter (%)	10.9	40.0
CEC (meq/100 g)	8.9	25.4

Soil samples were taken 0, 14, 30, 70, 119, 274 and 367 days after treatment. Soils were analysed for the active substance, pydiflumetofen, using LC-MS/MS (LOQ = 0.005 mg/kg).

Table 8 Residues of pydiflumetofen in soil following a single application of pydiflumetofen 18.35% SC formulation

Days after last treatment	Pydiflumetofen, Mean residue (mg/kg)	
	Suwon, Kyeonggi-do	BuYeo, Chungcheongham-do
X1 application (0.2 kg ai/ha)		
0	0.162	0.192
14	0.123	0.158
30	0.108	0.122
70	0.099	0.098
119	0.085	0.085
274	0.061	0.071
367	0.050	0.049
DT_{50}	254 days	228 days
X2 application (0.4 kg ai/ha)		
0	0.320	0.340
14	0.229	0.292
30	0.203	0.247
70	0.199	0.215
119	0.166	0.205
274	0.127	0.156
367	0.072	0.130
DT_{50}	216 days	310 days

No residues of pydiflumetofen were detected in untreated control samples at either site, at or above the LOQ. At both sites, and at both application rates, pydiflumetofen dissipated steadily over the study period. In Suwon, pydiflumetofen residues declined to 31% and 23% (mean values) of the initial concentrations (0 days after treatment) by the final sampling interval (day 367), for the X1 and X2 applications, respectively. In Bu Yeo (BuYeo), pydiflumetofen residues declined to 26% and 38% (mean values) of the initial concentrations (0 days after treatment) by the final sampling interval (day 367), for the X1 and X2 applications, respectively.

Japan

A terrestrial field dissipation study was conducted in 2015-2016 to determine the residue concentration of pydiflumetofen in two upland field soils (volcanic ash, alluvial) from the upland open field (bare land) study performed in Japan (Iwatani, 2016: Soil28P-2-05). Ibaraki Research Institute, Japan Plant Protection Association (hereinafter referred to as Ibaraki) consisting of volcanic ash soil and Noichi-cho, Konan-shi, Kochi, Japan Field of Kochi (hereinafter referred to as Kochi) consisting of alluvial soil. For both Ibaraki and Kochi fields, 1500 fold dilution of pydiflumetofen 20.0% flowable was applied twice to bare land of open field at individual application rates of 150 L/10 a (4.94×10^{-3} kg pydiflumetofen/ha). The target volume of the test substance solution was uniformly sprayed using a knapsack power sprayer and hand boom nozzles.

Test soil No. Location		Ibaraki	Kochi
Soil origin		Volcanic ash	Alluvial
Texture (USDA)		Loam	Loam
% Sand		37.0	40.9
% Silt		33.7	40.3
% Clay		22.9	18.8
pH	H_2O	6.6	6.2

Test soil No. Location		Ibaraki	Kochi
	KCl	5.6	4.8
Organic carbon (%)		38.7	16.9
CEC (meq/100 g)		29.2	15.0
Maximum water holding capacity (g/kg)		1140	525

Soils samples were taken immediately before and after application as well as 3, 7, 14, 30, 62, 120, 180, 240 and 359 days after final application for the Ibaraki site. While for the Kochi site samples were collected immediately before and after application as well as at 3, 7, 14, 30, 62, 120, 181, 240 and 359 days after final application. For both the sites each test plot was divided into 8 areas. For each sample, one columnar soil sample was collected from one arbitrary point in each area by inserting a borer to the depth of 10 cm. The columnar soils from each area were combined and mixed to make one sample. Soil samples were extracted and analysed according to method GRM061.04A. Pydiflumetofen residues were quantified by LC-MS/MS, with a LOQ of 0.01 mg/kg. Mean procedural recoveries and relative standard deviation (RSD) for the overall recovery of pydiflumetofen from soil samples were 93 (RSD 4.8%, n = 3) and 90 (RSD 7.7%, n = 3), for samples analysed from Ibaraki and Kochi soils, respectively.

Table 9 Residues of pydiflumetofen in soil following applications of pydiflumetofen 20.0% SC formulation

Days after last treatment	Pydiflumetofen, Mean residue (mg/kg)	
	Ibaraki	Kochi
0	0.69	0.46
3	0.55	0.46
7	0.54	0.34
14	0.52	0.36
30	0.58	0.32
62	0.38	0.24
120	0.29	0.14
180	0.30	0.06
240	0.26	0.12
359	0.27	0.18
DT_{50}	130.5 days	57.3 days

In the treated bare soil plot at both sites, pydiflumetofen dissipated steadily over the trial period. Maximum mean pydiflumetofen residues were 0.46 mg/kg, which dissipated to 0.18 mg/kg by the end of the trial at the Kochi site. Similarly, the maximum mean pydiflumetofen residues were 0.69 mg/kg, which dissipated to 0.27 mg/kg by the end of the trial at the Ibaraki site.

China study 1

Terrestrial field dissipation studies were conducted from 2017 to 2018 to determine the field persistence and leaching behaviour of pydiflumetofen when applied to bare soil in China (Wu, 2018: S2017TFD01-1, S2017TFD01-2, S2017TFD01-3). These interim reports provide study information up to summer 2018 for the on-going trial. A single spray application of pydiflumetofen SC formulation (200 g/L) was made to bare soil at a target rate of 2.025 L product/ha (equivalent to 405 g ai/ha) in water at 400 L/ha using a knapsack sprayer.

Parameter	Depth range (cm)								
	Nanning, Guanxi Province			Dezhou, Shandong Province			Nanjing, Jiangsu Province		
	0-10	10-20	20-30	0-10	10-20	20-30	0-10	10-20	20-30
Texture	Clay	Clay	Clay	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam
Sand (%)	13.2	12.8	10.8	30.4	22.4	23.8	8.4	9.6	10.0
Silt (%)	13.4	16.6	19.0	53.0	60.2	58.6	63.8	65.2	64.6
Clay (%)	73.4	70.6	70.2	16.6	17.4	17.6	27.8	25.2	25.4
Organic Carbon (%)	1.63	1.50	1.21	1.07	0.48	0.20	1.07	0.84	0.71
Organic Matter (%)[a]	2.80	2.58	2.09	1.85	0.82	0.34	1.84	1.45	1.23
CEC (meq/100g)	9.90	9.13	8.12	8.13	7.49	5.98	11.95	10.29	9.18
pH	4.60	4.35	4.65	7.50	7.55	8.05	6.85	6.85	6.55

[a] Organic matter (%) = Organic Carbon (%) × 1.7

Soil cores, to a depth of 30 cm, were obtained prior to the test item application, immediately after test item application and on eight subsequent days between 0 and 371 DAA. Residues of pydiflumetofen in soil were determined according to method GRM061.04A and were analysed using LC-MS/MS. The LOQ was 0.5 µg/kg and limit of detection (LOD) 0.1 µg/kg. Procedural recoveries (mean ± relative standard deviation) for analysis of pydiflumetofen in soil samples were calculated as 81.9 ± 3.4%.

Application rates were verified by the collection of samples deposited onto spray deposition collectors (Petri-dishes lined with filter paper, 15 cm diameter) placed onto the soil surface prior to application. The mean calculated application rates of pydiflumetofen derived from the Petri dish filter paper samples was determined as 457.6 ± 22.0 g ai/ha (Nanning), 377.5 ± 34.8 g ai/ha (Dezhou) and 466.9 ± 19.3 g ai/ha (Nanjing).

Table 10 Residues of pydiflumetofen in treated soil with depth (values are mean of treated plot replicates expressed on a dry weight basis)

Days After First Application	Mean Residues Found (µg/kg, dry weight)[a]		
	0-10 cm	10-20 cm	20-30 cm
Nanning, Guanxi Province			
0	347	NS	NS
7	233	< 0.5	< 0.5
14	183	0.6	0.8
28	193	2.1	0.7
56	213	12.8	< 0.5
120	190	< 0.5	< 0.5
180	130	< 0.5	< 0.5
273	90	< 0.5	< 0.5
365	107	2.3	1.5
Dezhou, Shandong Province			
0	253	NS	NS
7	220	7.7	< 0.5
14	200	2.7	< 0.5
28	160	< 0.5	< 0.5
60	137	< 0.5	< 0.5
126	113	10.3	< 0.5
179	103	< 0.5	< 0.5
277	107	6.0	< 0.5

Days After First Application	Mean Residues Found (µg/kg, dry weight)[a]		
	0-10 cm	10-20 cm	20-30 cm
370	120	1.0	< 0.5
Nanjing, Jiangsu Province			
0	343	NS	NS
7	303	40	< 0.5
14	227	< 0.5	< 0.5
27	223	< 0.5	< 0.5
64	130	< 0.5	< 0.5
119	93	< 0.5	< 0.5
183	80	< 0.5	< 0.5
273	100	4.0	1.0
371	97	1.8	< 0.5

NS = not sampled

[a] Mean value of residues from treated plot replicates A, B and C. In some instances, mean values are based on more than three data points, i.e., repeat analysis of individual replicate samples. Mean residue values were calculated in the 0-10, 10-20 and 20-30 cm depths by treating any values equal or below LOQ values as equal to 0.5 µg/kg.

Dissipation of pydiflumetofen residues occurred steadily over the course of the study, declining in the surface layer (0-10 cm) from 253-347 µg/kg to 97-120 µg/kg on Day 365-371. Pydiflumetofen residues were primarily found in the 0-10 cm soil layer. Residues in the 10-20 cm depths were detected consistently over the study period, typically being 1-7 µg/kg, with a maximum concentration of 40 µg/kg (mean of three replicates) recorded on Day 7. Pydiflumetofen residues in the 20-30 cm soil horizon were highest in samples obtained 365 days after the application resulting in 1.5 µg/kg.

Double First-Order in Parallel (DFOP) was observed to be the most appropriate description of kinetics, based on best curve fitting to the data and derived statistics. Pydiflumetofen DFOP DT_{50} value was 99.4 days (Nanning), 69.5 days (Dezhou) and 37.9 days (Nanjing).

China study 2

A terrestrial field dissipation study was conducted from 2017 to 2018 to determine the dissipation of pydiflumetofen under field conditions when applied to bare, silty loam soil, in Yangling, China (Chen, 2018: IPPC-EA-17-A-034-9). The trial is ongoing. This interim report provides results up to summer 2018. A single application of pydiflumetofen (a 200 g/L SC formulation) was applied to three sub-plots, at a target rate of 405 g ai/ha, as a broadcast application to the bare soil surface. Bare soil was maintained during the course of the study with glyphosate.

Parameter	Depth range (cm)		
	Yangling, Shanxi Province		
	0-10	10-20	20-30
Texture	Silty loam	Silty loam	Silty clay loam
Sand (%)	21.1	17.1	5.1
Silt (%)	60.0	56.0	64.0
Clay (%)	18.9	26.9	30.9
Organic Carbon (%)	0.59		
Organic Matter (%)[a]	1.01		
CEC (meq/100g)	14.6		
pH	8.19		

[a] Organic matter (%) = Organic Carbon (%) × 1.7

Soil cores, to a depth of 30 cm, were obtained prior to the test item application, immediately after application and then on eight subsequent days up to 367 days after application (DAA). Residues

of pydiflumetofen in soil were determined according to method GRM061.04A and were analysed using LC-MS/MS. The LOQ was 0.005 mg/kg. Procedural recoveries (mean ± standard deviation) for the analysis of pydiflumetofen in the soil samples were 97.4 ± 7.0%.

Application rates were verified by the collection of samples deposited onto filter papers placed onto the soil surface prior to application. The mean calculated application rate derived from the filter paper samples was 96.7% of the target rate.

Table 11 Residues of pydiflumetofen in treated soil with depth (values are mean of treated plot replicates expressed on a dry weight basis)

Days After Application (DAA)	Mean Residues Found (mg/kg, dry weight)[1)]		
	0-10 cm	10-20 cm	20-30 cm
Yangling, Shanxi Province			
0	0.241	--	--
7	0.310	< 0.005	< 0.005
14	0.188	< 0.005	< 0.005
28	0.135	< 0.005	< 0.005
61	0.123	< 0.005	< 0.005
123	0.118	< 0.005	< 0.005
183	0.103	< 0.005	< 0.005
271	0.0856	< 0.005	< 0.005
367	0.0494	< 0.005	< 0.005

-- = not analysed

No residues of pydiflumetofen above the LOQ were determined in any of the soil sub-samples taken at 0 days before application, which were regarded as untreated (control) specimens. Pydiflumetofen dissipated from soil over the course of the study. Mean residues of pydiflumetofen in the 0–10 cm soil core depths were 0.241 mg/kg (dry weight) at 0 DAA, declining to 0.0494 mg/kg (dry weight) at 367 DAA. Pydiflumetofen residues were confined to the 0–10 cm soil layer. Pydiflumetofen residues were below the LOQ in all 10–20 cm and 20–30 cm soil samples at all sampling intervals.

Double First-Order in Parallel (DFOP) was observed to be the most appropriate description of kinetics, based on best curve fitting to the data and derived statistics. Pydiflumetofen DFOP DT_{50} value was 47.1 days.

Summary of soil dissipation studies

The dissipation of pydiflumetofen under field conditions has been studied in the field in six studies in Europe, six studies in North America and ten studies in Asia. The data from the studies indicated were used to calculate DT_{50} values for pydiflumetofen. The report provides endpoints to allow the appropriate choice of DT_{50} for the calculation of soil plateau concentrations pydiflumetofen. The data were analysed using the CAKE v3.2 (2016) software package (Fletcher, 2018: 0485665).

Table 12 Details of field dissipation studies for pydiflumetofen used to calculate endpoints

Location	Soil texture (topsoil)	Soil pH (H_2O, topsoil)	Study duration (days)*	Reference
Ohrensen (DE)	Sandy loam	6.22	715	Finger (2015)
Emilia Romagna (IT)	Clay Loam	7.22	716	Finger (2015)
Bas Rhin (N. FR)	Silty clay loam	6.87	721	Finger (2015)
Midi-Pyrénées (S. FR)	Sandy loam	6.23	721	Finger (2015)
Valencia (ES)	Sandy loam	6.27	538	Finger (2015)
Wilson (UK)	Loam	6.52	718	Finger (2015)
Alberta (Canada)	Loam	8.0	703 (696)	Harrington (2015)
Prince Edward Island (Canada)	Sandy loam	6.4	463 (456)	Moore (2015)

Location	Soil texture (topsoil)	Soil pH (H_2O, topsoil)	Study duration (days)*	Reference
California (USA)	Loamy sand	7.5	735 (721)	Jacobsen (2015)
Iowa (USA)	Silty clay loam	6.8	601 (595)	Ghebremichael (2015)
Washington (USA)	Sand	7.9	610 (603)	Wiepke (2015)
Georgia (USA)	Sand	7.2	744 (723)	Jacobsen (2015)
Suwon (S Korea)	Sandy loam	4.3	367	TaeHan (2017)
Suwon (S Korea)	Sandy loam	4.3	367	TaeHan (2017)
Bu Yeo (S Korea)	Sandy loam	7.7	367	TaeHan (2017)
Bu Yeo (S Korea)	Sandy loam	7.7	367	TaeHan (2017)
Ibaraki (Japan)	Loam	6.6	366 (359)	Iwatani (2016)
Kochi (Japan)	Loam	6.2	366 (359)	Iwatani (2016)
Dezhou (China)	Silty loam	7.5	370	Wu (2018)
Nanning (China)	Clay	4.6	365	Wu (2018)
Nanjing (China)	Silty loam	6.85	371	Wu (2018)
Yangling (China)	Silty loam	8.19	367	Chen (2018)

* Days in parentheses correspond to the number of days after the final applications

Kinetic models were fitted to the data as reported in the dissipation study reports and no normalisation to reference conditions was performed. Where DT_{50} (SFO) kinetics provided an acceptable fit to the data, no further fits were conducted. Where DT_{50} (SFO kinetics were not appropriate DT_{90} (biphasic kinetics) were fitted and a conservative modelling DT_{50} has been back calculated from the DT_{90} (DT_{90}/3.32). FOMC kinetics have been preferred for biphasic DT_{90} datasets where deemed acceptable.

Where the DT_{90} from the FOMC kinetic fit is presented as > 10,000 days in CAKE, the DT_{90} has been calculated manually using the formula, shown below.

$$DT_{90} = \beta\left(10^{\frac{1}{\alpha}} - 1\right)$$

Table 13 Summary of DT_{50} values for pydiflumetofen

Trial location	Soil texture	Soil pH (H_2O)	χ^2 error %	DT_{50} (days)	Kinetic
Ohrensen (DE)	Sandy loam	6.22	9.21	1910	DT_{50}
Emilia Romagna (IT)	Clay Loam	7.22	11.6	1110	DT_{50}
Bas Rhin (N. FR)	Silty clay loam	6.87	9.70	4030	DT_{50}
Midi-Pyrénées (S. FR)	Sandy loam	6.23	13.3	10000[b]	DT_{90}
Valencia (ES)	Sandy loam	6.27	N/A[a]	N/A[a]	None[a]
Wilson (UK)	Loam	6.52	11.2	2810	DT_{50}
Alberta (Canada)	Loam	8.0	14.30	358	DT_{50}
Prince Edward Island (Canada)	Sandy loam	6.4	6.86	354	DT_{50}
California (USA)	Loamy sand	7.5	9.25	699	DT_{50}
Iowa (USA)	Silty clay loam	6.8	13.10	148[b]	DT_{90}
Washington (USA)	Sand	7.9	10.20	531	DT_{50}
Georgia (USA)	Sand	7.2	8.55	312	DT_{50}
Suwon (S Korea)	Sandy loam	4.3	10.60	215[C]	DT_{50}
Suwon (S Korea)	Sandy loam	4.3	12.00	200[c]	DT_{50}
Bu Yeo (S Korea)	Sandy loam	7.7	14.00	169[d]	DT_{50}
Bu Yeo (S Korea)	Sandy loam	7.7	8.68	266[d]	DT_{50}
Ibaraki (Japan)	Loam	6.6	12.30	202	DT_{50}
Kochi (Japan)	Loam	6.2	18.30	96.3	DT_{50}

Trial location	Soil texture	Soil pH (H_2O)	χ^2 error %	DT_{50} (days)	Kinetic
Dezhou (China)	Silty loam	7.5	15.50	10000[b]	DT_{90}
Nanning (China)	Clay	4.6	17.50	218	DT_{50}
Nanjing (China)	Silty loam	6.85	13.00	506[b]	DT_{90}
Yangling (China)	Silty loam	8.19	22.30	138	DT_{50}
Maximum				>10000	
Geometric mean				603	

[a] Data displayed a large degree of scatter and residues increased between 14 DAT and 358 DAT. Data from this site were considered unsuitable for deriving modelling endpoints.

[b] Conservative modelling DT_{50} calculated as $DT_{90}/3.32$ (maximum value set to 10000d)

[c] Duplicate Suwon data averaged before inclusion in overall geometric mean

[d] Duplicate Bu Yeo data averaged before inclusion in overall geometric mean

The degradation rate of pydiflumetofen 22 global field trial soils has been calculated. DT_{50} values for pydiflumetofen ranged from 96.3 to >10000 days.

Rotational crop studies

Field rotational crop studies

The limited field rotational crop studies conducted in Europe and the USA were submitted to the 2018 JMPR. The application rate of European studies was 500 g ai/ha and that of the US study was 400 g ai/ha.

For European studies, pydiflumetofen was detected at or above the LOQ (0.01 mg/kg) in a number of representative succeeding crops. The highest residues of pydiflumetofen were found in cereal straw at the earlier plant back intervals with levels of 0.02–0.09 mg/kg. By the later, 365 day interval, residue levels had reduced to a maximum of 0.01 mg/kg. In root crops and immature leafy crops, pydiflumetofen was found in crops planted back at the earlier 30 and 60 day intervals. In cereal forage, residues were only seen in the earliest plant back interval and for grain and mature spinach, no residues of pydiflumetofen were found at any of the plant back intervals.

For the US study, there was little uptake of pydiflumetofen from soil into rotational root or leafy crops, and residues were < 0.01 mg/kg in these crops at all plantback intervals. There was some uptake of pydiflumetofen from soil into cereals resulting in low residues in wheat straw and hay at all plantback intervals but residues were < 0.01 mg/kg in wheat grain.

Study 1

The study consisted of two field crop rotation trials carried out in Northern France and Germany during 2016 and 2017 to determine any residues of pydiflumetofen in crops grown on a plot previously treated with pydiflumetofen (Allen, 2018: CEMR-7709). In each trial, pydiflumetofen was applied as an SC formulation containing 200 g pydiflumetofen per litre. To all treated subplots, one application was made to bare soil at a rate of 600 g ai/ha, the chemical was incorporated into the soil by power harrow one month before plant back (depth 10 cm) or by rotary harrow one week before plant back (depth 5 cm).

Country	State/Province	Town/Village	Soil type
Northern France	Centre	Loriet	Clay Loam
Germany	Niedersachsen	Stade	Loamy Sand

Nine representative rotated crops (kale, tomato, maize, soya bean, bean, strawberry, spinach, carrot and radish) were planted to subplots at designated timings. The nominal plantback timings for each crop were 30, 120, 270 and 330 days after last application. The rotational crops were maintained

according to normal agricultural practices. For kale, leaves were collected at BBCH 49. For tomato, fruit was collected at BBCH 74-89. For maize, whole cobs and remaining plant were collected at BBCH 89. For soya bean, the crop did not develop sufficiently to obtain seeds from either trial. Soya bean forage was collected at BBCH 79-81. For bean, fresh seed and remaining plant was collected at BBCH 79 and dry seed was collected at BBCH 89. Where the bean crop did not develop sufficiently to obtain seeds, whole bean plant was collected at BBCH 74-75. For strawberry, fruit was collected at BBCH 87-89. For spinach, immature leaves were collected at BBCH 43-51 and mature leaves collected at BBCH 49-65. For carrot, roots and tops with foliage were collected at BBCH 49. For radish, roots and tops with foliage were collected at BBCH 49.

Specimens of kale (leaves), tomato (fruit), maize (whole cobs), maize (remaining plant), soya bean (forage), bean (fresh seed), bean (dry seed) bean (remaining plant), bean (whole plant), strawberry (fruit), spinach (leaves), carrot (roots), carrot (tops with foliage), radish (roots) and radish (tops with foliage) were taken by hand. All specimens were stored deep frozen at <-18 °C at the test sites before being shipped on to the test facility for residue analysis, where the specimens were also stored deep frozen at <- 18 °C. The crop samples were prepared by homogenisation with dry ice.

Table 14 Pydiflumetofen residues in rotational crops

Crop part	Variety	Trial site	Residues, mg/kg			
			30 day PBI*	120 day PBI*	270 day PBI*	330 day PBI*
Kale (leaves)	Reflex	France	< 0.01	< 0.01	< 0.01	< 0.01
	Winneton	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Tomato (fruit)	Montfaret	France	< 0.01	< 0.01	< 0.01	< 0.01
	Harzfeur	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Maize (whole cobs)	Quincey	France	< 0.01	< 0.01	< 0.01	< 0.01
	P7378	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Maize (remaining plant)	Quincey	France	< 0.01	0.02	< 0.01	0.01
	P7378	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Soya bean (forage)	SG Fider	France	0.01	0.01	0.01	0.01
Bean (whole plant)	Flagiano	France	< 0.01	< 0.01	< 0.01	< 0.01
Bean (fresh seed)	Primel	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Bean (remaining plant)	Primel	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Bean (dry seed)	Primel	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Strawberry (fruit)	Charlotte	France	< 0.01	< 0.01	< 0.01	< 0.01
	Honeoye	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Spinach (immature leaves)	Samos	France	0.01	< 0.01	< 0.01	< 0.01
	Molokai	Germany	< 0.01	< 0.01	0.02	< 0.01
Spinach (mature leaves)	Samos	France	0.05	0.01	0.01	0.01
	Molokai	Germany	< 0.01	0.02	0.03	< 0.01
Carrot (roots)	Hekla	France	0.02	0.02	0.02	0.01
	Yaguna F1	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Carrot (tops with foliage)	Hekla	France	0.01	< 0.01	< 0.01	< 0.01
	Yaguna F1	Germany	0.01	< 0.01	< 0.01	< 0.01
Radish (roots)	Apache	France	0.04	0.01	< 0.01	< 0.01
	Alese	Germany	< 0.01	< 0.01	< 0.01	< 0.01
Radish (tops with foliage)	Apache	France	0.03	< 0.01	< 0.01	< 0.01
	Alese	Germany	< 0.01	< 0.01	< 0.01	< 0.01

* Actual PBI

France: 30, 118, 273 and 334 days

Germany: 32, 125, 268 and 330 days

The samples were analysed for pydiflumetofen using method GRM061.03A. Residues of pydiflumetofen were below the LOQ of the method (0.01 mg/kg) in kale, tomato, maize (whole cobs), bean (fresh seed), bean (remaining plant), bean (dry seed) and strawberry.

Residues of pydiflumetofen were found in samples of maize (remaining plant) at 0.01 mg/kg at the 120 and 330 day plant back intervals, in samples of soya bean (forage) at 0.01 mg/kg at the 30, 120, 270 and 330 day plant back intervals, in samples of spinach (immature) at 0.01 mg/kg at the 30 day plant back interval and at 0.02 mg/kg at the 270 day plant back interval, in samples of spinach (mature) at 0.05 mg/kg at the 30, 0.01–0.02 mg/kg at the 120, 0.01–0.03 mg/kg at the 270 and 0.01 mg/kg at the 330 day plant back intervals, in carrots (roots) at 0.01 mg/kg at the 330 day plant back interval and at 0.02 mg/kg at the 30, 120 and 270 day plant back intervals and in carrots (tops with foliage) at 0.01 mg/kg at the 30 day plant back interval. For both trials, residues of pydiflumetofen in the control samples were less than the LOQ (< 0.01 mg/kg) of the method.

Study 2

The study consisted of two field crop rotation trials carried out in Southern France and Spain during 2016 and 2017 to determine any residues of pydiflumetofen in crops grown on a plot previously treated with pydiflumetofen (Jutsum and Allen, 2018: CEMR-7710). In each trial, pydiflumetofen was applied as an SC formulation containing 200 g pydiflumetofen per litre. To all treated subplots, one application was made to bare soil at a rate of 600 g ai/ha, the chemical was incorporated into the soil by ploughing or power harrow before plant back (depth not recorded) or by light cultivation (depth 5-10 cm) before plant back.

Country	State/Province	Town/Village	Soil type
Southern France	Midi-Pyrénées	Tarn et Garonne	Loamy
Spain	Aragón	Zaragoza	Loam

Nine representative rotated crops (kale, tomato, maize, soya bean, bean, strawberry, spinach, carrot and radish were planted into subplots at designated timings. The nominal plant back timings for each crop were 30, 120, 270 and 330-365 days after last application. The rotational crops were maintained according to normal agricultural practices. For kale, leaves were collected at BBCH 49. For tomato, fruit was collected at BBCH 89. For maize, whole cobs and remaining plant were collected at BBCH 89. For soya bean, forage and seed were collected at BBCH 79-89. For bean, fresh seed and remaining plant were collected at BBCH 79 and dry seed was collected at BBCH 89. For strawberry, fruit was collected at BBCH 89. For spinach, immature leaves were collected at BBCH 43 and mature leaves were collected at BBCH 49. For carrot, roots and tops with foliage were collected at BBCH 49. For radish, roots and tops with foliage were collected at BBCH 49.

Specimens of kale (leaves), tomato (fruit), maize (whole cobs), maize (remaining plant), soya bean (forage), bean (fresh seed), bean (dry seed) bean (remaining plant), strawberry (fruit), spinach (leaves), carrot (roots), carrot (tops with foliage), radish (roots) and radish (tops with foliage) were taken by hand. All specimens were stored deep frozen at <-18 °C at the test sites before being shipped on to the test facility for residue analysis, where the specimens were also stored frozen at <-18 °C. The crop samples were prepared by homogenisation with dry ice.

Table 15 Pydiflumetofen residues in rotational crops

Crop part	Variety	Trial site	Residues, mg/kg			
			30 day PBI*	120 day PBI*	270 day PBI*	330-365 day PBI*
Kale (leaves)	Winterbor F1	France	< 0.01	< 0.01	< 0.01	< 0.01
	Toscana	Spain	< 0.01	NS	< 0.01	NS
Tomato (fruit)	Rio	France	< 0.01	< 0.01	< 0.01	< 0.01
	Manitor	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Maize	LG30597	France	< 0.01	< 0.01	< 0.01	< 0.01

Crop part	Variety	Trial site	Residues, mg/kg			
			30 day PBI*	120 day PBI*	270 day PBI*	330-365 day PBI*
(whole cobs)	P9400	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Maize (remaining plant)	LG30597	France	< 0.01	< 0.01	< 0.01	< 0.01
	P9400	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Soya bean (forage)	Palladore	France	< 0.01	< 0.01	< 0.01	< 0.01
	Judia Mung	Spain	NS	< 0.01	NS	< 0.01
Soya bean (seed)	Palladore	France	< 0.01	< 0.01	< 0.01	< 0.01
	Judia Mung	Spain	NS	< 0.01	NS	< 0.01
Bean (fresh seed)	Mogex	France	< 0.01	< 0.01	< 0.01	< 0.01
	Contender	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Bean (remaining plant)	Mogex	France	< 0.01	< 0.01	< 0.01	< 0.01
	Contender	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Bean (dry seed)	Mogex	France	< 0.01	< 0.01	< 0.01	< 0.01
	Contender	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Strawberry (fruit)	Mara des bois	France	< 0.01	< 0.01	< 0.01	< 0.01
Spinach (immature and mature leaves)	Samos F1	France	< 0.01	< 0.01	< 0.01	< 0.01
	Gigante de Invierno	Spain	< 0.01	NS	< 0.01	NS
Carrot (roots)	Lagos F1	France	0.02	0.03	0.01	0.02
	Mantesa Forte	Spain	NS	< 0.01	NS	< 0.01
Carrot (tops with foliage)	Lagos F1	France	0.01	0.01	< 0.01	< 0.01
	Mantesa Forte	Spain	NS	< 0.01	NS	< 0.01
Radish (roots)	Radis de 18 jours	France	0.03	0.01	< 0.01	< 0.01
	Punta Redonda	Spain	< 0.01	< 0.01	< 0.01	< 0.01
Radish (tops with foliage)	Radis de 18 jours	France	0.02	0.01	< 0.01	< 0.01
	Punta Redonda	Spain	< 0.01	< 0.01	< 0.01	< 0.01

NS – No sample available for analysis

* Actual PBI

France: 32, 116, 287 and 340 days

Spain: 31, 126, 253 and 339 days

The samples were analysed for pydiflumetofen using method GRM061.03A. Residues of pydiflumetofen were below the LOQ of the method (0.01 mg/kg) in kale, tomato, maize (whole cobs and remaining plant), soya bean (forage and seed), bean (fresh seed, remaining plant and dry seed), spinach and strawberry.

Residues of pydiflumetofen were found in samples of carrots (roots) at 0.02 mg/kg at the 330-365 and 30 day plant back intervals, at 0.01 mg/kg at the 270 day plant back interval and at 0.03 mg/kg at the 120 day plant back interval, carrots (tops with foliage) at 0.01 mg/kg at both the 120 and 30 day plant back intervals, radish (roots) at 0.01 mg/kg at the 120 day plant back interval and at 0.03 mg/kg at the 30 day plant back interval, radish (tops with foliage) at 0.01 mg/kg at the 120 day plant back interval and at 0.02 mg/kg at the 30 day plant back interval. For both trials, residues of pydiflumetofen in the control samples were less than the LOQ (< 0.01 mg/kg) of the method.

USE PATTERN

The 2018 JMPR received labels in Argentina, Canada and the USA. The information available to Meeting on registered uses of pydiflumetofen is summarized in Table below.

Table 16 Registered uses of pydiflumetofen for crops

Crop	Country	Formulation		Application					PHI, days and/or Application timing
		Type	Conc.	Method	Rate kg ai/ha	Water L/ha	No. max	Interval, days	
Small fruit vine climbing Crops (except fuzzy kiwifruit)	Canada	SC	150 g/L	Spray	0.12–0.15 max 0.30 /season	≥500[a] ≥150[b]	2	21	PHI 14 Early bloom
Grape and Small Fruit Vine Climbing Subgroup (except Fuzzy Kiwifruit), Crop Subgroup 13-07F	USA	SC	200 g/L	Spray	0.050–0.20 max 0.40 /year	≥93[a] ≥45[b]	2	14	PHI 14 Prior to disease onset
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.31 /year	≥140[a] ≥93[b]	4	14	PHI 14 Prior to disease onset
	USA	SC	150 g/L	Spray	0.075–0.15 max 0.40 /year	≥93[a b]	2	21	PHI 14
Cucumber (greenhouse)	Canada	SC	200 g/L	Spray	0.01 kg ai/hL	400-500	2	7-14	PHI 0 Prior to disease development or at first sign of disease symptoms
Cucurbit vegetables Crops	Canada	SC	75 g/L	Spray	0.075 max 0.15 /season	≥150[a]	2	14	PHI 0 Prior to disease establishment
Cucurbit Vegetables, Crop Group 9	USA	SC	200 g/L	Spray	0.073–0.13 max 0.25 /year	≥93[a] ≥45[b]	2	7	PHI 0 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.25 /year	≥93[a] ≥45[b]	3	7	PHI 0 Prior to disease development
	USA	SC	150 g/L	Spray	0.072–0.12 max 0.25 /year	≥93[a b]	2	7	PHI 1 Prior to disease development
Fruiting vegetables Crops	Canada	SC	75 g/L	Spray	0.075 max 0.15 /season	≥150[a]	2	7-14	PHI 0 Prior to disease establishment
Fruiting Vegetables, Crop Group 8-10	USA	SC	200 g/L	Spray	0.073–0.13 max 0.25 /year	≥93[a] ≥45[b]	2	7	PHI 0 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.25 /year	≥140[a] ≥45[b]	3	7	PHI 0 Prior to disease development
	USA	SC	150 g/L	Spray	0.072–0.12 max 0.25 /year	≥93[a b]	2	7	PHI 0 Prior to disease development

Crop	Country	Formulation		Application					PHI, days and/or Application timing
		Type	Conc.	Method	Rate kg ai/ha	Water L/ha	No. max	Interval, days	
Tomato	USA	SC	75 g/L	Spray	0.049–0.077 max 0.25 /year	≥140[a]	3	7	PHI 0 Prior to disease development
Leafy Greens Crops	Canada	SC	150 g/L	Spray	0.12–0.15 max 0.30 /season	≥150[a]	2	7-10	PHI 3 Immediately after emergence or prior to disease development
Leafy Greens, Crop Subgroup 4-16A	USA	SC	200 g/L	Spray	0.073–0.20 max 0.40 /year	≥93[a] ≥45[b]	2	7	PHI 0 Prior to disease development
Specific Leafy Greens	USA	SC	150 g/L	Spray	0.075–0.15 max 0.40 /year	≥93[a b]	2	7	PHI 0 Prior to disease development
Dried shelled peas and beans (pulses) (Crop Subgroup 6C) Crops (does not include soya beans)	Canada	SC	200 g/L	Spray	0.10–0.20 max 0.40 /season	≥100[a] ≥50[b]	2	14	PHI 14 1st appl. first bloom to 10% bloom.
	Canada	SC	75 g/L	Spray	0.075–0.094 max 0.19 /season	≥100[a] ≥50[b]	2	14	PHI 30[d] Before disease establishment and no later than the onset of flowering
Dried Shelled Peas and Beans (except Soya bean), Crop Subgroup 6C	USA	SC	200 g/L	Spray	0.073–0.20 max 0.40 /year	≥93[a] ≥45[b]	2	14	PHI 14 vines and hay: PHI 0 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.31 /year max 0.16 /year for pea vines and hay	≥140[a] ≥93[b]	4	14	PHI 14 Prior to disease development Do not feed or harvest cowpeas forage and hay.
Specific Dried Shelled Beans	USA	SC	150 g/L	Spray	0.072–0.15 max 0.40 /year	≥93[a] ≥45[b]	2	14	PHI 14 Prior to disease development Do not apply to cowpea.
	USA	SE	75 g/L	Spray	0.055–0.075 max 0.16 /year	≥93[a] ≥45[b]	2	14	PHI 14 Before disease is established and no later than the onset of flowering Not for use on cowpea cultivars intended for livestock feeding only.
Soya bean	Argentina	SC	75 g/L	Spray	0.038–0.045	≥100[a] ≥15[b]	2	15	PHI 30

Crop	Country	Formulation		Application					PHI, days and/or Application timing
		Type	Conc.	Method	Rate kg ai/ha	Water L/ha	No. max	Interval, days	
Soya bean [e]	Canada	SC	200 g/L	Spray	0.10–0.20 max 0.40 /season	≥100[a] ≥50[b]	2	7-14	PHI 14 1st appl. R1-R2 developmental stage.
	Canada	SC	75 g/L	Spray	0.056–0.094 max 0.19 /season	≥100[a] ≥50[b]	2	14	PHI 30 Before disease establishment and no later than the onset of flowering
Soya bean [e]	USA	SC	200 g/L	Spray	0.050–0.20 max 0.40 /year	≥93[a] ≥45[b]	2	7	PHI 14 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.075 max 0.16 /year	≥93[a] ≥45[b]	2	7	PHI 14 Prior to disease development
	USA	SE	75 g/L	Spray	0.055–0.11 max 0.24 /season	≥93[a] ≥45[b]	2	14	PHI 14 Prior to disease development Do not apply after R6.
Potato	Canada	SC	75 g/L	Spray	0.075 max 0.225 /season	≥150[a] ≥50[b]	2	7-14	PHI 14 Prior to disease establishment
Potato [f]	USA	SC	200 g/L	Spray	0.050–0.13 max 0.38 /year	≥93[a] ≥45[b]	3	7	PHI 7 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.31 /year	≥140[a] ≥45[b]	4	7	PHI 14 Prior to disease development
	USA	SC	150 g/L	Spray	0.075–0.12 max 0.37 /year	≥93[a] ≥45[b]	3	7	PHI 14 Prior to disease development
Tuberous and corm vegetables	Canada	SC	75 g/L	Spray	0.075 max 0.225 /season	≥150[a]	2	7-14	PHI 14 Prior to disease establishment
Tuberous and Corm Vegetables (except Potato), Crop Subgroup 1C[f)]	USA	SC	200 g/L	Spray	0.073–0.13 max 0.38 /year	≥93[a] ≥45[b]	3	7	PHI 7 Prior to disease development
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.31 /year	≥93[a] ≥45[b]	4	7	PHI 14 Prior to disease development
	USA	SC	150 g/L	Spray	0.12 max 0.37 /season	≥93[a] ≥45[b]	3	7	PHI 14 Prior to disease development
Leaf Petioles Vegetables (Crop group 22B) Crops	Canada	SC	150 g/L	Spray	0.12–0.15 max 0.30 /season	≥150[a]	2	7-10	PHI 3 Prior to or at the onset of disease

Crop	Country	Formulation		Application					PHI, days and/or Application timing
		Type	Conc.	Method	Rate kg ai/ha	Water L/ha	No. max	Interval, days	
Leaf Petioles Vegetables, Crop Subgroup 22B	USA	SC	200 g/L	Spray	0.073–0.20 max 0.40 /year	≥93[a] ≥45[b]	2	7	PHI 0 Prior to disease development
Specific Leaf Petioles	USA	SC	150 g/L	Spray	0.075–0.15 max 0.40 /year	≥93[a b]	2	7	PHI 0 Prior to disease development
Barley Wheat (spring, winter, and durum)	Canada	SC	200 g/L	Spray	0.060–0.20	≥150[a] ≥50[b]	1	14	1st appl. BBCH 29-55 Do not apply after Feekes 10.54 (flowering completed, kernel watery ripe) or BBCH 71 [g]
Cereal grains Crops	Canada	SC	75 g/L	Spray	0.056	≥100[a] ≥50[b]	2	14	PHI 45 1st appl. BBCH 29-55 No later than BBCH 55[h]
Cereal Grains	USA	SC	200 g/L	Spray	0.055–0.20 max 0.35 /year	≥93[a] ≥45[b]	1[3)]	14	After first tiller visible to 2-6 node stage (Feekes 2-7) Do not apply after full head emergence (Feekes 10.54)[g]
	USA	SE	75 g/L	Spray	0.038–0.075 max 0.15 /year	≥93[a] ≥45[b]	2	14	After first tiller visible to 2-6 node stage (Feekes 2-7) Do not apply after full head emergence (Feekes 10.54)[g] Do not apply within 14 days prior grazing.
Quinoa[i]	USA	SC	200 g/L	Spray	0.10–0.20 max 0.35 /year	≥93[a] ≥45[b]	1	14	PHI 30 Prior to disease development
	USA	SE	75 g/L	Spray	0.058–0.075 max 0.16 /year	≥93[a] ≥45[b]	2	14	PHI 30 Prior to disease development
Corn (field, pop, specialty, sweet and seed)	Canada	SC	200 g/L	Spray	0.10 max 0.20 /season	≥200[a] ≥50[b]	2	-	1st appl. BBCH 63-67 PHI 30 for grain and stover [g] PHI 7 for sweet corn
	Canada	SC	75 g/L	Spray	0.056–0.094 max 0.15 /season	≥200[a] ≥50[b]	2	14	1st appl. at the first sign of disease PHI 30 for grain and stover [j] PHI 14 for sweet corn

Crop	Country	Formulation		Application					PHI, days and/or Application timing
		Type	Conc.	Method	Rate kg ai/ha	Water L/ha	No. max	Interval, days	
Corn (field corn, popcorn (including for seed production))	USA	SC	200 g/L	Spray	0.050–0.20 max 0.25 /year	≥93[a] ≥45[b]	1[3)]	7	PHI 30[g] Early appl. 4-8 leaves have emerged
	USA	SE	75 g/L	Spray	0.055–0.075 max 0.25 /year	≥93[a] ≥45[b]	3	7	PHI 30 Early appl. 4-8 leaf collars present
Sweet corn (including for seed production	USA	SC	200 g/L	Spray	0.050–0.13 max 0.25 /year	≥93[a] ≥45[b]	2	7	PHI 7 Prior to disease development
	USA	SE	75 g/L	Spray	0.055–0.075 max 0.25 /year	≥93[a] ≥45[b]	3	7	PHI 14 Prior to disease development
Canola (Crop subgroup 20A) Crops	Canada	SC	200 g/L	Spray	0.10–0.20 max 0.33 /season	≥100[a] ≥50[b]	2	-	PHI 30 10-50% bloom
Canola (Rapeseed, Crop Subgroup 20A)	USA	SC	200 g/L	Spray	0.10–0.20 max 0.33 /year	≥93[a] ≥45[b]	1[c]	14	PHI 30 During the rosette stage between 2nd true leaf and bolting
	USA	SC	75 g/L	Spray	0.049–0.077 max 0.077 /year	≥93[a] ≥45[b]	1	-	PHI 30 During the rosette stage between 2nd true leaf and bolting
	USA	SE	75 g/L	Spray	0.057–0.075 max 0.075 /year	≥93[a] ≥45[b]	1	-	PHI 30 During the rosette stage between 2nd true leaf and bolting
Peanut	Argentina	SC	75 g/L	Spray	0.045–0.053	≥100[a] ≥15[b]	2	15	PHI 20
Peanut	Canada	SC	200 g/L	Spray	0.025–0.050 max 0.20 /season	≥100[a] ≥50[b]	4	14-21 or 21-28[k]	PHI 14 Prior to disease development
Peanut	USA	SC	200 g/L	Spray	0.025–0.050 max 0.20 /year	≥93[a] ≥45[b]	4	14-21 or 21-28[k]	PHI 14 Prior to disease development
	USA	SE	75 g/L	Spray	0.050 max 0.20 /year	≥93[a] ≥45[b]	4	21	PHI 14 Prior to disease development

[a] ground application,

[b] aerial application

[c] Do not make more than 1 application at the maximum application rate per year.

[d] Dry pea hay and vines may be fed or harvested 14 days after last application. Do not make more than one application to dry pea hay. Do not feed dried pea vines to livestock.

[e] Do not feed soya bean forage, hay and silage to livestock.

[f] Do not harvest tops for feed or food.

[g] For harvest of forage and hay, one application with a minimum PHI of 7days is required.

[h] Do not apply within 30 days of harvest for forage and hay. Do not make more than one application for harvest of forage and hay.

[i] Do not feed treated quinoa forage or hay to livestock. Do not graze livestock on treated quinoa.

[j] Do not apply within 30 days of harvest for forage.

[k] Apply 0.025 kg ai/ha on a 14-21 day interval. Application at the 0.050 kg ai/ha may be made on a 21-28 day interval.

APPRAISAL

Pydiflumetofen is a broad-spectrum fungicide belonging to the carboxamide group. It acts through inhibition of succinate dehydrogenase in complex II of fungal mitochondrial respiration. Pydiflumetofen was first evaluated for toxicology and residues by JMPR in 2018. An ADI of 0–0.1 mg/kg bw and an ARfD of 0.3 mg/kg bw were established. The residue definition for compliance with the MRL for plant and animal commodities, and dietary risk assessment for plant commodities is pydiflumetofen. The residue definition for dietary risk assessment for animal commodities other than mammalian liver and kidney is the sum of pydiflumetofen and 2,4,6-TCP and its conjugates, expressed as pydiflumetofen and for dietary risk assessment for mammalian liver and kidney is the sum of pydiflumetofen, 2,4,6-TCP and its conjugates, and SYN547897 and its conjugates, expressed as pydiflumetofen. The residue is fat-soluble.

The 2018 JMPR noted that pydiflumetofen residues may be taken up by rotational crops and considered very persistent in soil (up to 2380 days DT_{50}), and its accumulation, following subsequent years of treatment is expected. Therefore, the 2018 JMPR concluded that the information available did not allow the estimation of pydiflumetofen residues in rotational crops, especially in view of expected plateau soil concentrations being significantly higher than the rate applied in the available field rotational crop study.

The Meeting received information on field soil degradation studies for pydiflumetofen from several regions and field rotational crop studies.

Environmental fate

The Meeting received field soil degradation studies for pydiflumetofen to estimate the expected plateau level of pydiflumetofen in soil treated with pydiflumetofen.

Soil degradation (field studies)

Pydiflumetofen soil DT_{50} values were calculated based on 22 trials conducted in Canada, China, France, Germany, Italy, Japan, Republic of Korea, Spain, the UK, and the USA. DT_{50} values for pydiflumetofen ranged from 96.3 to >10 000 days, with a geometric mean of 603 days. Noting that the maximum value (>10 000 days) is not an evidence-based estimate and that field dissipation studies are typically conducted for a duration of 2 years, the Meeting decided that the geometric mean of 603 days was the most suitable value for estimating the plateau level in soil.

Calculation of soil plateau level

Based on the soil DT_{50} (603 days) of pydiflumetofen, the accumulation factor (f_{acc}) was calculated using the equation of $f_{acc} = e^{-kt} / (1 - e^{-kt})$, with degradation rate (k) and an application interval (t) of 365 days. Degradation rate (k) is calculated as $\ln 2/DT_{50}$ (= 0.001149). Therefore, f_{acc} of pydiflumetofen is 1.918.

The plateau background residue level ($A_{plateau}$) can be calculated as $A_0 f_{soil} f_{acc}$.

A_0 = Total seasonal application rate to target crop (g ai/ha)

f_{soil} = Fraction of the seasonal application rate reaching the soil after crop interception

Pydiflumetofen is a foliage-applied product, though application timings are variable dependent on crop and timing of disease development. As a reasonable worst case use pattern, pydiflumetofen was assumed to have been applied at the earliest foliar stage (BBCH 10–19: Leaf development stage). According to FOCUS guidance (2015)[4], crop interception rate of 23% was calculated by taking the geometric mean of minimal crop cover stage (BBCH 10–19) of all crops excluding permanent crops such as citrus and olive trees. The amount reaching the soil after crop interception (f_{soil}) was assumed to be 0.77 (77%). The maximum seasonal application rate for pydiflumetofen (A_0) is 400 g ai/ha. Therefore, $A_{plateau}$ of pydiflumetofen (400 × 0.77 × 1.918) is 591 g ai/ha.

According to OECD rotational crop guidance (2018)[5], application rates employed in crop rotation studies should be the sum of the maximum use rate for the compound (400 g ai/ha) and the calculated soil plateau level (591 g ai/ha), which leads to 991 g ai/ha. Moreover, for the trial design of rotational crop studies involving application to bare soil and subsequent sowing/planting, the proportionality concept is applicable.

Rotational crop studies

The current Meeting received additional field rotational crop studies conducted in European countries.

Field rotational crop studies

Pydiflumetofen SC formulation was applied to bare soil at 0.60 kg ai/ha. The trials were established for each of nine representative rotated crops (kale, tomato, maize, soya bean, bean, strawberry, spinach, carrot and radish) at a number of plant back intervals (30, 120, 270, 330–365 days).

Residues of pydiflumetofen were below the LOQ (0.01 mg/kg) in kale, tomato, maize (whole cobs), bean (fresh seed, remaining plant and dry seed) and strawberry at all plant back intervals.

Residues of pydiflumetofen were found at 0.01–0.02 mg/kg in maize (remaining plant: 120 and 330 day plant back interval (PBI), soya bean (forage: 30, 120, 270 and 330 day PBI), spinach (immature: 30 and 270 day PBI, mature: 120, 270 and 330 day PBI), carrots (roots: 30, 120, 270 and 330–365 day PBI, tops: 30 and 120 day PBI), radish (roots: 120 day PBI, tops: 30 and 120 day PBI).

Residues of pydiflumetofen were found in spinach (mature) at 0.03–0.05 mg/kg (30 and 270 day PBI), carrots (roots) at 0.03 mg/kg (120 day PBI), radish (tops) at 0.03 mg/kg (30 day PBI) and radish (roots) at 0.04 mg/kg (30 day PBI).

In field rotational crop studies submitted to the 2018 JMPR, pydiflumetofen SC formulation was applied to bare ground in European countries and the USA at 0.40–0.50 kg ai/ha (Europe: 1 × 0.50 kg ai/ha, USA: 2×0.20 kg ai/ha). The trials were established for each of three representative crop types (Europe: spinach, carrot and spring barley, USA: spinach/lettuce, radish and wheat) at each plant back interval (Europe: 30, 60 and 365 days, USA: 30, 60, 90 and 150 days).

Residues of pydiflumetofen were below the LOQ (0.01 mg/kg) in spinach (mature), lettuce, radish and cereal grains (barley and wheat).

Residues of pydiflumetofen were found at 0.01–0.02 mg/kg in spinach (immature: 30 and 60 day PBI), carrot (roots: 30 and 60 day PBI, tops: 60 day PBI) and cereal whole plant (barley: 30 day PBI, wheat: 90 day PBI).

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[4] Generic guidance for FOCUS surface water scenarios, Version: 1.4, Date: May 2015

[5] Guidance Document on Residues in Rotational Crops: OECD Environment, Health and Safety Publications Series on Pesticides No. 97, Series on Testing and Assessment No. 279. ENV/JM/MONO(2018)9

Residues of pydiflumetofen were found in spring barley straw at 0.02–0.09 mg/kg (30 and 60 day PBI), and wheat hay and wheat straw at 0.01–0.11 mg/kg (90 day PBI) with a subsequent decline to < 0.01–0.07 mg/kg (150 day PBI).

Residues in rotated crops following applications at 400–600 g ai/ha were scaled with factors of 1.7–2.5 to estimate the residues expected at the higher application rate of 991 g ai/ha.

Table 1 Scaling of the highest rotational crop residues

Crop	Application rate of rotational crop studies (g ai/ha)	Scaling factor	Highest rotational residue (mg/kg)	Residue scaled to account for 991 g ai/ha
Strawberry (fruit)	600	1.7	< 0.01	< 0.02
Tomato (fruit)	600	1.7	< 0.01	< 0.02
Kale	600	1.7	< 0.01	< 0.02
Leaf lettuce	400	2.5	< 0.01	< 0.03
Spinach (immature)	500	2.0	0.02	0.04
Spinach (mature)	600	1.7	0.05	0.09
Bean (whole plant)	600	1.7	< 0.01	< 0.02
Bean (fresh seed)	600	1.7	< 0.01	< 0.02
Bean (remaining plant)	600	1.7	< 0.01	< 0.02
Bean (dry seed)	600	1.7	< 0.01	< 0.02
Soya bean (forage)	600	1.7	0.01	0.02
Soya bean (seed)	600	1.7	< 0.01	< 0.02
Carrot (tops)	500	2.0	0.01	0.02
Carrot (roots)	600	1.7	0.03	0.05
Radish (tops)	600	1.7	0.03	0.05
Radish (roots)	600	1.7	0.04	0.07
Maize (whole cobs)	600	1.7	< 0.01	< 0.02
Maize (remaining plant)	600	1.7	0.02	0.03
Barley (whole plant)	500	2.0	0.02	0.04
Barley (grain)	500	2.0	< 0.01	< 0.02
Barley (straw)	500	2.0	0.09	0.18
Wheat (forage)	400	2.5	0.01	0.03
Wheat (hay)	400	2.5	0.05	0.13
Wheat (grain)	400	2.5	< 0.01	< 0.03
Wheat (straw)	400	2.5	0.11	0.28

Table 2 The residues scaled to plateau level of pydiflumetofen in soil

"Super" Crop Group [a]	Commodity	Trial No.	Residue scaled (mg/kg)		
			Mean	Median	Highest
Root and tuber vegetables	Carrot roots	8	0.03	0.02	0.05
	Radish roots	7	0.02	0.02	0.07
Cereals	Wheat grain	3	< 0.03	< 0.03	< 0.03
	Barley grain	4	< 0.02	< 0.02	< 0.02
	Maize whole cobs	2	< 0.02	< 0.02	< 0.02
Leafy vegetables and Brassicas	Spinach (mature)	7	0.03	0.02	0.09
	Spinach (immature)	10	0.02	0.02	0.04
	Leaf lettuce	1	< 0.03	< 0.03	< 0.03
	Kale	4	< 0.02	< 0.02	< 0.02
Oilseeds and pulses	Soya bean seed	2	< 0.02	< 0.02	< 0.02
	Bean dry seed	3	< 0.02	< 0.02	< 0.02
Fruits and fruiting vegetables	Tomato	4	< 0.02	< 0.02	< 0.02
	Strawberry	3	< 0.02	< 0.02	< 0.02
Root leaves and tops [b]	Radish tops	7	0.02	0.02	0.05
	Carrot tops	8	0.02	0.02	0.02
	Beans fresh seed	3	< 0.02	< 0.02	< 0.02

[a] Referred to in the OECD rotational crop guidance.

[b] This group is not included in OECD rotational crop guidance.

Table 3 Feed residues scaled to plateau level of pydiflumetofen in soil

Animal Feeds	Commodity	Trial No.	Residue scaled (mg/kg)		
			Mean	Median	Highest
Legume animal feeds	Soya bean forage	3	0.02	0.02	0.02
	Bean forage	4	< 0.02	< 0.02	< 0.02
Straw and fodder of cereal grains	Maize stover	4	0.02	0.02	0.03
	Barley straw	4	0.05	0.03	0.18
	Wheat hay	3	0.06	0.06	0.11
	Wheat straw	3	0.10	0.08	0.28
Forage of cereal grains	Barley forage	4	0.02	0.02	0.04
	Wheat forage	3	0.03	0.03	0.03

Results of supervised residue trials on crops

For maximum residue level estimation of pydiflumetofen residues in plant commodities, the addition of residues arising from direct treatment in combination with root uptake of pydiflumetofen from previous years must be taken into account. The Meeting decided to use the crop groups for plant food and feed established in the Codex Classification of Foods and Animal Feeds to give recommendations on the overall residue levels of pydiflumetofen expected in these commodities.

The corresponding residue values from supervised trials are obtained from the 2018 JMPR evaluation of pydiflumetofen.

The Meeting noted that the use of statistical methods for the estimation of maximum residue levels is not possible when considering potential carryover of residues in succeeding crops, since the basis arising from the additional root uptake cannot be adequately calculated using the OECD MRL calculator.

The Meeting recognized that the estimation of maximum residue levels for permanent crops and crops cultivated in/on culture soil/medium and water are not needed, as those crops are not expected to be subject to a potential uptake of pydiflumetofen from the soil.

Grapes

Grapes are normally cultivated as permanent crops and are not expected to be subject to a potential uptake of pydiflumetofen from the soil. The Meeting confirmed its previous recommendation for the subgroup of small fruit vine climbing of 1.5 mg/kg.

Bulb vegetables

Although pydiflumetofen is not used for treatment of bulb vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. However, no residue data on suitable succeeding crops to estimate a maximum residue level for bulb vegetables were available.

The Meeting could not estimate a maximum residue level for the group of bulb vegetables.

Brassica vegetables

Although pydiflumetofen is not registered for use on Brassica vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The

Meeting decided to use the scaled mean, median and highest residues found in leafy vegetables and Brassicas (spinach) in field studies on succeeding crops of 0.03, 0.02 and 0.09 mg/kg, respectively for the estimation of a maximum residue level, STMR value and HR value for Brassica vegetables.

The Meeting estimated a maximum residue level of 0.1 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.09 mg/kg for the group of Brassica vegetables.

Fruiting vegetables, Curcurbits

Based on the outcome of a Kruskal-Wallis H-test, the 2018 JMPR concluded that the residue populations from trials on cucumber, summer squash and cantaloupe were not different and the data could be combined to estimate a maximum residue level for fruiting vegetables, cucurbits.

The combined pydiflumetofen residues in cucumber, summer squash and cantaloupe were in rank order (n = 21): 0.056, 0.061, 0.067, 0.078, 0.10, 0.11 (5), 0.12, 0.14, 0.15, 0.16 (3), 0.17, 0.18, 0.19, 0.23 and 0.26 mg/kg.

In field studies on succeeding crops the scaled highest residue in fruiting vegetables (tomato) was < 0.02 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 0.4 mg/kg, an STMR value of 0.12 mg/kg and an HR value of 0.27 mg/kg (based on the highest residue of replicate samples) for the group of fruiting vegetables, cucurbits.

Fruiting vegetables, other than Cucurbits

Based on the outcome of a Mann-Whitney U-test, the 2018 JMPR concluded that the residue populations from trials on tomatoes and peppers were not different and the data could be combined to estimate a maximum residue level for fruiting vegetables, other than cucurbits except Martynia, Okra and Roselle.

The combined pydiflumetofen residues in tomatoes and peppers were in rank order (n = 21): 0.030, 0.043, 0.062, 0.075, 0.076, 0.077, 0.081, 0.082, 0.083, 0.088, 0.11, 0.13, 0.14, 0.16, 0.17, 0.20, 0.23, 0.26 (2), 0.27 and 0.37 mg/kg.

In field studies on succeeding crops the scaled highest residue in fruiting vegetables (tomato) was < 0.02 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR value of 0.11 mg/kg and an HR value of 0.42 mg/kg (based on the highest residue of replicate samples) for the group of fruiting vegetables, other than cucurbits (except Martynia, Okra and Roselle).

Martynia, Okra and Roselle

Although pydiflumetofen is not registered for use on Martynia, Okra and Roselle, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in fruiting vegetables (tomato) in field studies on succeeding crops of < 0.02, < 0.02 and < 0.02 mg/kg, respectively for an estimation of a maximum residue level, STMR value and HR value in Martynia, Okra and Roselle.

The Meeting estimated a maximum residue level of 0.02 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.02 mg/kg for Martynia, Okra and Roselle.

Leafy vegetables

Leafy greens

The residues on head lettuce according to the US GAP were (n = 8): 0.51, 0.78, 1.2, 2.3, 2.4, 2.6, 3.0 and 4.5 mg/kg.

The residues on leaf lettuce according to the US GAP were (n = 8): 1.7, 3.5, 4.4, 5.5, 7.7, 9.7, 11 and 12 mg/kg.

The residues on spinach according to the US GAP were (n = 8): 7.5, 9.2, 9.7, 12, 13 (2), 14 and 16 mg/kg.

Based on the outcome of a Kruskal-Wallis H-test, the 2018 JMPR concluded that the residue populations from trials on head lettuce, leaf lettuce and spinach were significantly different. However, the residues in individual crops were similar (medians were within 5×). Therefore, the 2018 JMPR decided to use the dataset from spinach leading to the highest maximum residue level for leafy greens.

In field studies on succeeding crops the scaled mean, median and highest residues in leafy vegetables and Brassicas (spinach) were 0.03, 0.02 and 0.09 mg/kg, respectively. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 40 mg/kg, an STMR value of 12.5 mg/kg and an HR value of 17 mg/kg (based on the highest residue of replicate samples) for the subgroup of leafy greens.

Brassica leafy vegetables

Although pydiflumetofen is not registered for use on Brassica leafy vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in leafy vegetables and Brassicas (spinach) in field studies on succeeding crops of 0.03, 0.02 and 0.09 mg/kg, respectively for an estimation of a maximum residue level, STMR value and HR value in Brassica leafy vegetables.

The Meeting estimated a maximum residue level of 0.1 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.09 mg/kg for the subgroup of leaves of Brassicaceae.

Leaves of root vegetables

Although pydiflumetofen is not registered for use on leaves of root vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in root leaves and tops (radish) in field studies on succeeding crops of 0.02, 0.02 and 0.05 mg/kg, respectively for an estimation of a maximum residue level, STMR value and HR value in leaves of root vegetables.

The Meeting estimated a maximum residue level of 0.07 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.05 mg/kg for the subgroup of leaves of root and tuber vegetables except leaves of tuber vegetables.

Legume vegetables

Although pydiflumetofen is not registered for use on legume vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in beans fresh seeds in field studies on succeeding crops of < 0.02, < 0.02 and < 0.02 mg/kg, respectively for an estimation of a maximum residue level, STMR value and HR value in legume vegetables.

The Meeting estimated a maximum residue level of 0.02 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.02 mg/kg for the group of legume vegetables.

Pulses

Dry beans and dry peas

Based on the outcome of a Kruskal-Wallis H-test, the 2018 JMPR concluded that the residue populations from trials on dry beans, soya beans and dry peas were not different and the data could be combined to estimate a maximum residue level for subgroup of dry beans and subgroup of dry peas.

The combined pydiflumetofen residues in dry beans, soya bean and dry peas were in rank order (n = 41): < 0.01 (9), 0.011, 0.012, 0.013, 0.014, 0.016 (2), 0.18, 0.023 (2), 0.027, 0.028 (2), 0.029, 0.031, 0.032, 0.035, 0.036, 0.039, 0.041, 0.053, 0.057, 0.059, 0.060 (2), 0.063, 0.064, 0.088, 0.096, 0.10, 0.24, 0.29 and 0.37 mg/kg.

In field studies on succeeding crops the scaled highest residue in oilseeds and pulses (dry beans and soya bean) was < 0.02 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 0.4 mg/kg and an STMR value of 0.028 mg/kg for the subgroup of dry beans and the subgroup of dry peas.

Root and tuber vegetables

Root vegetables

Although pydiflumetofen is not registered for use on root vegetables, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in root and tuber vegetables (radish) in field studies on succeeding crops of 0.02, 0.02 and 0.07 mg/kg, respectively for an estimation of a maximum residue level, STMR value and HR value in root vegetables.

The Meeting estimated a maximum residue level of 0.1 mg/kg, an STMR value of 0.02 mg/kg and an HR value of 0.07 mg/kg for the subgroup of root vegetables.

Tuberous and corm vegetables

The residues on potatoes according to the US GAP were (n = 22): < 0.01 (21) and 0.014 mg/kg.

In field studies on succeeding crops the scaled mean, median and highest residues in root and tuber vegetables (radish) were 0.02, 0.02 and 0.07 mg/kg, respectively. The Meeting concluded that residues in potatoes, the representative commodity for tuberous and corm vegetables, may be influenced significantly by uptake of pydiflumetofen from the soil. The Meeting decided to add the scaled mean residue found in field studies on succeeding crops of 0.02 mg/kg to the median residue obtained from supervised field trials on potato of 0.01 mg/kg for an overall STMR for potatoes of 0.03 mg/kg.

For the estimation of a maximum residue level the highest residue found in root and tuber vegetables in succeeding crop field trials was 0.07 mg/kg in radish roots. The Meeting estimated a maximum residue level for tuberous and corm vegetables of 0.1 mg/kg. Adding the highest residue of 0.014 mg/kg found in supervised field trials to the highest residue of 0.07 mg/kg for radish roots in the succeeding crops, results in an overall highest residue in tuberous and corm vegetables of 0.084 mg/kg.

The Meeting estimated a maximum residue level of 0.1 mg/kg, an STMR value of 0.03 mg/kg and an HR value of 0.084 mg/kg for the subgroup of tuberous and corm vegetables.

Stalk and stem vegetables

Stalk and stem vegetables – Stems and Petioles

The residues on celery according to the US GAP were (n = 8): 2.6, 2.7, 3.9, 4.3, 4.5, 4.8, 5.4 and 8.1 mg/kg.

For stalk and stem vegetables no data from studies on succeeding crops were available. The Meeting concluded that the scaled mean, median and highest residue values of 0.03, 0.02 and 0.09 mg/kg respectively found in leafy vegetables and Brassicas (spinach) indicate that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 15 mg/kg, an STMR value of 4.4 mg/kg and an HR value of 9.3 mg/kg (based on the highest residue of replicate samples) for the subgroup of stems and petioles.

Cereal grains

Wheat, similar grains, and pseudocereals without husks

The residues on wheat grains according to the US GAP were (n = 29): 0.015, 0.025, 0.035, 0.038, 0.040 (2), 0.048, 0.050, 0.057 (3), 0.062 (2), 0.063 (2), 0.067 (2), 0.10 (2), 0.11, 0.12 (4), 0.13, 0.17, 0.19 and 0.23 (2) mg/kg.

In field studies on succeeding crops the scaled highest residue in wheat grains was < 0.03 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 0.4 mg/kg and an STMR value of 0.063 mg/kg for the subgroup of wheat, similar grains, and pseudocereals without husks.

Barley, similar grains, and pseudocereals with husks

The combined pydiflumetofen residues in barley grains and oats were in rank order (n = 38): 0.056, 0.068, 0.079, 0.081 (2), 0.11 (2), 0.12, 0.14, 0.15 (3), 0.19 (2), 0.20 (2), 0.21, 0.22, 0.23 (2), 0.24, 0.27, 0.31, 0.32, 0.36, 0.41, 0.44, 0.48, 0.51, 0.54, 0.55, 0.57, 0.66 (2), 0.82, 0.94, 2.1 and 3.0 mg/kg.

In field studies on succeeding crops the scaled highest residue in barley grains was < 0.02 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 3 mg/kg and an STMR value of 0.23 mg/kg for the subgroup of barley, similar grains, and pseudocereals with husks.

Maize Cereals

The residues on field corn and popcorn according to the US GAP were (n = 22): < 0.01 (21) and 0.012 mg/kg.

In field studies on succeeding crops mean, median and highest residues in maize (whole cobs) were < 0.02, < 0.02 and < 0.02 mg/kg, respectively. The Meeting concluded that residues in maize, the representative commodity for maize cereals, may be influenced by additional uptake of pydiflumetofen from the soil. The Meeting decided to add the scaled mean residue found in field studies on succeeding crops of 0.02 mg/kg to the median residue obtained from supervised field trials on field corn and popcorn of 0.01 mg/kg for an overall STMR for maize cereals of 0.03 mg/kg.

For the estimation of a maximum residue level the scaled highest residue found in succeeding crop field trials was < 0.02 mg/kg in maize. The Meeting estimated a maximum residue level of 0.04 mg/kg and an STMR value of 0.03 mg/kg for the subgroup of maize cereals.

Sweet Corns

The residues on sweet corn according to the US GAP were (n = 12): < 0.01 (12) mg/kg.

In field studies on succeeding crops the scaled mean, median and highest residues in maize (whole cobs) were < 0.02, < 0.02 and < 0.02 mg/kg, respectively. The Meeting concluded that residues in sweet corn, the representative commodity for sweet corns, may be influenced by an additional uptake of pydiflumetofen from the soil. It was decided to add the mean and highest residues found in field studies on succeeding crops of 0.02 mg/kg to the median and highest residues obtained from supervised field trials on sweet corn of 0.01 mg/kg for an overall STMR and HR for pydiflumetofen in sweet corns of 0.03 mg/kg.

For the estimation of maximum residue levels the scaled highest residue found in succeeding crop field trials was < 0.02 mg/kg in maize. The Meeting estimated a maximum residue level of 0.03 mg/kg, an STMR value of 0.03 mg/kg and an HR value of 0.03 mg/kg for the subgroup of sweet corns.

Rice Cereals, and Sorghum Grain and Millet

Although pydiflumetofen is not registered for use on rice cereals, sorghum grain and millet, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in cereal grains (wheat) in field studies on succeeding crops of < 0.03, < 0.03 and < 0.03 mg/kg, respectively for an estimation of maximum residue levels and STMR values in these commodities.

The Meeting estimated a maximum residue level of 0.03 mg/kg and an STMR value of 0.03 mg/kg for the subgroup of rice cereals and the subgroup of sorghum grain and millet.

Oilseeds and Oilfruits

Small seed oilseeds

The residues on rape seeds according to Canadian and US GAP were (n = 18): 0.020, 0.031, 0.041, 0.046, 0.048, 0.050, 0.056, 0.070, 0.094, 0.095, 0.11, 0.14, 0.15, 0.17, 0.18, 0.35, 0.46 and 0.69 mg/kg.

In field studies on succeeding crops the scaled highest residue in oilseeds and pulses (soya beans seeds and dry beans) was < 0.02 mg/kg. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 0.9 mg/kg and an STMR value of 0.0945 mg/kg for the subgroup of small seed oilseeds.

Peanut

The residues on peanut nutmeat according to Canadian and US GAP were (n = 12): < 0.01 (9), 0.012 and 0.018 (2) mg/kg.

In field studies on succeeding crops the scaled mean, median and highest residue in oilseeds and pulses (soya beans seeds and dry beans) were < 0.02, < 0.02 and < 0.02 mg/kg respectively. The Meeting concluded that residues in peanut nutmeat may be influenced by an additional uptake of pydiflumetofen from the soil. It was decided to add the mean residue found in field studies on

succeeding crops of 0.02 mg/kg to the median residue obtained from supervised field trials on peanut nutmeat of 0.01 mg/kg for an overall STMR for pydiflumetofen in peanut of 0.03 mg/kg.

For estimation of a maximum residue level the scaled highest residue found in succeeding crop field trials was < 0.02 mg/kg in soya bean seeds and dry beans. The Meeting estimated a maximum residue level of 0.05 mg/kg and an STMR value of 0.03 mg/kg for peanut.

Sunflower seeds and Cotton seed

Although pydiflumetofen is not registered for use on sunflower seeds and cotton seed, these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median highest residues found in wheat straw (worst case) in field studies on succeeding crops of 0.10, 0.08 and 0.28 mg/kg, respectively for an estimation of a maximum residue level and STMR value in these commodities.

The Meeting estimated a maximum residue level of 0.3 mg/kg and an STMR value of 0.08 mg/kg for the subgroup of sunflower seeds and cotton seed.

RESIDUES IN ANIMAL FEEDS

Legume animal feeds

The residues on pea vines (as received basis) according to Canadian GAP were (n = 5): 0.36, 0.42, 0.88, 0.90 and 2.8 mg/kg.

The residues on pea hay (dry weight basis) according to Canadian GAP were (n = 5): 1.8, 3.0, 3.4, 5.9 and 17 mg/kg.

The residues on peanut hay (dry weight basis) according to the US GAP were (n = 11): 2.0, 3.1, 4.3, 4.5, 4.7, 9.2, 12 (3), 13 and 15 mg/kg.

The Meeting concluded that the application of pydiflumetofen to pea vines and peanut hay results in the highest residues in legume animal feeds and can be used for estimation of a maximum residue level, a median value and a highest value for the whole group.

In field studies on succeeding crops the scaled mean, median and highest residues in legume animal feeds (soya bean forage) were 0.02, 0.02 and 0.02 mg/kg, respectively. The Meeting concluded that residues in pea vines and peanut hay from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

Based on the residues for pea vines, the Meeting estimated a median residue value of 0.88 mg/kg and a highest residue value of 2.8 mg/kg for forage of legume animal feeds on an “as received” basis.

Based on the residues for peanut hay, the Meeting estimated a maximum residue level of 30 mg/kg, a median residue value of 9.2 mg/kg and a highest residue value of 15 mg/kg for fodder of legume animal feeds on a dry weight basis.

Straw and fodder of barley, oats, rye, triticale and wheat

The combined pydiflumetofen residues in straw and hay of barley, oats and wheat were in rank order (n = 81): 1.4 (2), 1.8, 1.9, 2.0, 2.2, 2.5, 3.0, 3.1, 3.6, 3.7 (2), 3.8, 3.9, 4.0 (2), 4.2, 4.5, 4.7, 5.1, 5.3, 5.5, 5.7 (3), 5.9, 6.0, 6.5 (2), 6.6, 6.8 (2), 7.2, 7.5, 7.7, 8.0 (2), 8.2, 8.3, 8.4, 9.2 (2), 9.5, 9.9, 10 (3), 11 (4), 12 (2), 13 (2), 14 (2), 15, 16, 17 (3), 18 (2), 19 (2), 20 (5), 21, 23 (2), 24, 25, 26, 29, 33, 34 and 40 mg/kg on dry weight basis.

In field studies on succeeding crops the scaled mean, median and highest residues in wheat straw (fresh) were 0.10, 0.08 and 0.28 mg/kg, respectively. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting concluded that residues on straw and fodder from barley, oats and wheat may be extrapolated to straw and fodder from rye and triticale.

The Meeting estimated a maximum residue level of 50 mg/kg, a median residue value of 9.2 mg/kg and a highest residue value of 40 mg/kg for straw and fodder of barley, oats, rye, triticale and wheat on a dry weight basis.

Maize fodder

The residues on maize stover (as received basis) according to Canadian GAP were (n = 23): 0.82, 1.1, 1.3, 1.5, 1.6 (2), 1.9, 2.1, 2.3, 2.6, 3.0, 3.1, 3.2, 3.4, 3.5 (3), 3.7, 4.2, 4.8, 5.0 (2) and 13 mg/kg.

In field studies on succeeding crops the scaled mean, median and highest residues in maize stover were 0.02, 0.02 and 0.03 mg/kg, respectively. The Meeting concluded that residues from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a maximum residue level of 18 mg/kg (correction for an average 83% dry matter content), a median residue value of 3.1 mg/kg (as received) and a highest residue value of 13 mg/kg (as received) for the maize fodder.

Straw and fodder of millet, rice and sorghum

Although pydiflumetofen is not registered for use on other cereal straw and fodder plants (millet, rice and sorghum), these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues following uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in wheat straw in field studies on succeeding crops of 0.10, 0.08 and 0.28 mg/kg (fresh-weight) respectively for an estimation of maximum residue levels and STMR values in straw and fodder of millet, rice and sorghum.

The Meeting estimated a maximum residue level of 0.3 mg/kg (dry weight basis), a median residue value of 0.08 mg/kg and a highest residue value of 0.28 mg/kg (as received basis) for pydiflumetofen in straw and fodder of millet, rice and sorghum.

Forage of barley, oats, rye, triticale, wheat, maize and sweet corn

The residues on oats forage (as received basis) according to the US GAP were (n = 28): 0.47, 0.62, 0.65, 0.73, 0.75, 1.0, 1.2, 1.3, 1.5 (2), 1.6, 1.8 (2), 1.9, 2.0, 2.3 (2), 2.7, 2.9, 3.2, 3.3, 3.6, 3.7, 4.2, 5.3, 6.5, 6.6, 7.0 mg/kg.

The residues on wheat forage (as received basis) according to the US GAP were (n = 31): 0.24, 0.52, 0.97, 0.98, 1.2, 1.4, 1.6 (2), 1.7, 1.9 (2), 2.2 (2), 2.3, 2.5, 2.7, 3.3, 3.4, 3.6, 4.0, 4.2, 4.4, 4.8, 4.9, 5.4 (2), 6.2, 6.3, 7.7 and 11 (2) mg/kg.

The residues on maize forage (as received basis) according to the US GAP were (n = 20): 0.38, 0.45, 0.64, 0.67, 0.69, 0.79, 0.91, 1.0 (3), 1.3 (2), 1.5, 1.6, 2.0, 2.1, 2.2, 2.4, 2.8 and 4.9 mg/kg.

The residues on sweet corn forage (as received basis) according to the US GAP were (n = 12): 0.44, 0.49, 0.68, 0.73 (2), 0.75, 0.80, 0.90, 1.0, 1.2 (2) and 3.9 mg/kg.

In field studies on succeeding crops the scaled mean, median and highest residues in barley forage were 0.02, 0.02 and 0.04 mg/kg respectively, and in wheat forage were 0.03, 0.03 and 0.03 mg/kg respectively. The Meeting concluded that residues in forage of oats, wheat, maize and sweet corn from uptake of pydiflumetofen via the roots are insignificant in comparison to residue levels following direct treatment.

The Meeting estimated a median residue value of 1.95 mg/kg and a highest residue value of 7.0 mg/kg for oats forage (as received basis).

The Meeting concluded that residues on forage from oats may be extrapolated to forage from barley.

The Meeting estimated a median residue value of 2.7 mg/kg and a highest residue value of 11 mg/kg for wheat forage (as received basis).

The Meeting concluded that residues on forage from wheat may be extrapolated to forage from rye and triticale.

The Meeting estimated a median residue value of 1.15 mg/kg and a highest residue value of 4.9 mg/kg for maize forage (as received basis).

The Meeting estimated a median residue value of 0.775 mg/kg and a highest residue value of 3.9 mg/kg for sweet corn forage (as received basis).

Forage of cereal grain, except barley, oats, rye, triticale, wheat, maize and sweet corn

Although pydiflumetofen is not registered for use on other cereal forage (except barley, oats, rye, triticale, wheat and maize), these crops may still be subject to crop rotation and therefore contain pydiflumetofen residues after uptake via the roots. The Meeting decided to use the scaled mean, median and highest residues found in wheat forage in field studies on succeeding crops of 0.03, 0.03 and 0.03 mg/kg (fresh-weight) respectively for an estimation of median values and highest values in forage of cereal grain, except barley, oats, rye, triticale, wheat, maize and sweet corn.

The Meeting estimated a median residue value of 0.03 mg/kg and a highest residue value of 0.03 mg/kg for pydiflumetofen in forage of cereal grain, except barley, oats, rye, triticale, wheat, maize and sweet corn (as received basis).

Fate of residues during processing

Processing data on various commodities are reported in the evaluation from 2018 for pydiflumetofen. All data relevant for an estimation of maximum residue levels in processed commodities or for dietary exposure calculations are summarized in the following table.

Although the studies on sweet corn were conducted at an exaggerated application rate compared to the critical GAP, pydiflumetofen residues in the RAC were below the LOQ of 0.01 mg/kg. Processing factors for sweet corn processed commodities cannot be determined.

Table 4 Processing factors and STMR-P/HR-P

Raw commodity [STMR/HR]	Processed commodity	Individual processing factors	Mean or best estimate processing factor	STMR-P = $STMR_{RAC}$ × PF (mg/kg)	HR-P = HR_{RAC} × PF (mg/kg)
Tomato [0.11 mg/kg/ 0.42 mg/kg]	Canned	< 0.046, < 0.077	< 0.046	< 0.005	< 0.019
	Dried	9.9, 11	10.5	1.2	4.4
	Juice (Pasteurised)	< 0.046, < 0.077	< 0.046	< 0.005	
	Paste	0.55, 0.82	0.685	0.075	
	Puree	0.26, 0.41	0.335	0.037	
	Wet pomace	3.3, 4.5	3.9	0.43	
Soya bean [0.028 mg/kg]	Refined oil	0.078, 0.29	0.184	0.005	
	Miso	0.091, 0.17	0.131	0.004	
	Milk	< 0.056, < 0.064	< 0.056	< 0.002	
	Flour	< 0.056, < 0.064	< 0.056	< 0.002	
	Soya sauce	< 0.056, < 0.064	< 0.056	< 0.002	
	Tofu	0.14, 0.15	0.145	0.004	
	AGF	121, 156	139	3.9	
	Meal	0.065, 0.090	0.078	0.002	

Raw commodity [STMR/HR]	Processed commodity	Individual processing factors	Mean or best estimate processing factor	STMR-P = $STMR_{RAC}$ × PF (mg/kg)	HR-P = HR_{RAC} × PF (mg/kg)
	Hulls	2.9, 3.7	3.3	0.092	
	Pollard	0.26, 0.36	0.31	0.009	
Potato [0.03 mg/kg/ 0.084 mg/kg]	Boiled (peeled)	< 0.45	< 0.45	< 0.014	< 0.038
	Baked (unpeeled)	< 0.45	< 0.45	< 0.014	< 0.038
	Dried pulp	4.3	4.3	0.13	0.36
	Chips	< 0.45	< 0.45	< 0.014	
	Crisps	< 0.45	< 0.45	< 0.014	
	Starch	< 0.45	< 0.45	< 0.014	
	Flakes	< 0.45	< 0.45	< 0.014	
	Wet peel	2.1	2.1	0.063	0.18
Wheat [0.063 mg/kg]	Bran	1.9, 2.6	2.25	0.14	
	Wholemeal bread	0.41, 0.45	0.43	0.027	
	Germs	1.0, 1.9	1.45	0.091	
	Flour	0.30, 0.34	0.32	0.020	
	Starch	0.019, 0.050	0.035	0.002	
	Gluten	1.1, 2.3	1.7	0.11	
	AGF	127, 598	363	23	
	Gluten feed meal	1.3, 2.4	1.85	0.12	
	Milled by-product	2.5, 9.7	6.1	0.38	
Barley [0.23 mg/kg]	Bran	0.24, 0.48	0.36	0.083	
	Flour	0.23, 0.23	0.23	0.053	
	Pearled barley	0.024, 0.062	0.043	0.010	
Oats [0.23 mg/kg]	Bran	0.013, 0.017	0.015	0.003	
	Flour	0.027, 0.068	0.048	0.011	
	Rolled oats	0.012, 0.013	0.013	0.003	
Maize [0.03 mg/kg]	Refined oil	1.5, 2.3 (wet milled)	1.9	0.057	
		< 0.42, <1.2 (dry milled)	< 0.42	< 0.013	
	Bran (hulls)	3.7, 5.8 (dry milled)	4.75	0.14	
	Grits	< 0.42, <1.2 (dry milled)	< 0.42	< 0.013	
	Germs	2.0, 2.2 (wet milled)	2.1	0.063	
		0.91, <1.2 (dry milled)	0.91	0.027	
	Flour	< 0.42, <1.2 (wet milled)	< 0.42	< 0.013	
		<1.2, 1.6 (dry milled)	1.6	0.048	
	Meal	0.93, <1.2 (dry milled)	0.93	0.028	
	Starch	< 0.42, <1.2 (wet milled)	< 0.42	< 0.013	
	AGF	69, 71	70	2.1	
	Milled by-product	1.7, 2.7	2.2	0.066	
	Gluten	0.70, 1.9 (wet milled)	1.3	0.039	
	Gluten meal	3.1, 3.3 (wet milled)	3.2	0.096	
Rape seed [0.0945 mg/kg]	Refined oil	0.36, 0.38	0.37	0.035	
	Meal	0.087, 0.094	0.091	0.009	
Peanut [0.03 mg/kg]	Refined oil	2.4	2.4	0.072	
	Meal	< 0.4	< 0.4	< 0.012	

On the basis of the maximum residue level, STMR and HR for fruiting vegetables, other than cucurbits and the default dehydration factor of 10, the Meeting estimated a maximum residue level of 5 mg/kg, an STMR value of 1.1 mg/kg and an HR value of 4.2 mg/kg for chili peppers (dry).

Using the estimated maximum residue level of 0.5 mg/kg for the group of fruiting vegetables, other than cucurbits and applying the processing factor of 10.5, the Meeting estimated a maximum residue level of 7 mg/kg for pydiflumetofen in dried tomato.

Using the estimated maximum residue level of 0.1 mg/kg for the subgroup of tuberous and corm vegetables and applying the processing factor of 4.3, the Meeting estimated a maximum residue level of 0.5 mg/kg for pydiflumetofen in dried potato.

Using the estimated maximum residue level of 0.4 mg/kg for the subgroup of wheat, similar grains, and pseudocereals without husks and applying the processing factor of 2.25 for wheat bran and 1.45 for wheat germs the Meeting estimated a maximum residue level of 1 mg/kg and 0.6 mg/kg for pydiflumetofen in wheat bran and wheat germ, respectively.

Using the estimated maximum residue level of 0.04 mg/kg for the subgroup of maize cereals and applying the processing factor of 1.9 for maize refined oil and 1.6 for maize flour, the Meeting estimated maximum residue levels of 0.08 mg/kg and 0.07 mg/kg for pydiflumetofen in maize oil, edible and maize flour, respectively.

Using the estimated maximum residue level of 0.05 mg/kg for peanut and applying the processing factor of 2.4, the Meeting estimated a maximum residue level of 0.15 mg/kg for pydiflumetofen in peanut oil, edible.

Residues in animal commodities

Farm animal feeding studies

Farm animal feeding studies (lactating dairy cow and laying hen) are reported in the evaluation of the 2018 JMPR.

Farm animal dietary burden

Some processed and forage commodities do not appear in the Recommendations Table (because no maximum residue level is needed), but they are used in estimating livestock dietary burdens. Those commodities are included in the list below. The input was based on the intake of pydiflumetofen.

Table 5 Potential feed items

Codex classification	Commodity	Median residue (-P) (mg/kg)	Highest residue (-P) (mg/kg)
Grape	Grape wet pomace	0.87	
Brassica vegetables	Head cabbage leaves	0.02	0.09
Fruiting vegetables, other than Cucurbits	Tomato wet pomace	0.43	
Brassica leafy vegetables	Kale leaves	0.02	0.09
Leaves of root and tuber vegetables	Turnip tops	0.02	0.02
	Sugar beet tops	0.02	0.02
Pulses	Beans (dry) seed, Cowpea seed, Lupin seed, Field pea (dry) seed, Soya bean (dry) seed, Vetch seed	0.028	
	Soya bean aspirated grain fractions	3.9	
	Soya bean meal	0.002	
	Soya bean hulls	0.092	
	Soya bean pollard	0.009	
Root vegetables	Carrot culls, Swede roots, Turnip roots	0.02	0.07
	Potato dried pulp	0.13	
	Potato process waste (wet peel)	0.063	
Tuberous and corn vegetables	Cassava roots, Potato culls	0.03	0.084
Wheat, similar grains, and pseudocereals without husks	Rye grain, Triticale grain, Wheat grain	0.063	
	Wheat aspirated grain fractions	23	
	Wheat gluten meal	0.12	

Codex classification	Commodity	Median residue (-P) (mg/kg)	Highest residue (-P) (mg/kg)
	Wheat milled by-product	0.38	
Barley, similar grains, and pseudocereals with husks	Barley grain, Oats grain	0.23	
	Barley bran fractions	0.083	
Maize Cereals	Maize grain, Popcorn grain,	0.03	
	Maize aspirated grain fractions	2.1	
	Maize milled by-product	0.066	
	Maize meal	0.028	
	Maize gluten	0.039	
	Maize gluten meal	0.096	
Small seed oilseeds	Rape seed meal	0.009	
Peanut	Peanut meal	< 0.012	
Legume animal feeds	Forage of legume animal feeds	0.88 (as received)	2.8 (as received)
	Fodder of legume animal feeds	9.2 (dry weight)	15 (dry weight)
Straw and fodder of cereal grains	Straw and fodder of barley, oats, rye triticale, and wheat	9.2 (dry weight)	40 (dry weight)
	Maize fodder	3.1 (as received)	13 (as received)
	Straw and fodder of cereal grains, except barley, oats, rye, triticale, wheat and maize	0.08 (as received)	0.28 (as received)
Forage of cereal grains [a]	Forage of barley and oats	1.95	7.0
	Forage of rye, triticale and wheat	2.7	11
	Maize forage	1.15	4.9
	Sweet corn forage	0.775	3.9
	Forage of cereal grains, except barley, oats, rye, triticale, wheat, maize and sweet corn	0.03	0.03

[a] levels for cereal forage are presented on as received basis.

The dietary burdens, estimated using the OECD diets listed in Appendix IX of the 2016 edition of the FAO manual, are presented in Annex 6 and summarized below.

Table 6 Estimated maximum and mean dietary burdens of farm animals

	Animal dietary burden: Pydiflumetofen, ppm of dry matter diet							
	US-Canada		EU		Australia		Japan	
	max	mean	max	mean	max	mean	max	mean
Beef cattle	7.9	3.3	22	7.3	44❶	11❸	0.38	0.36
Dairy cattle	21	5.9	22	7.3	42❷	10❹	7.7	2.0
Poultry – broiler	0.35	0.35	0.34	0.29	0.17	0.17	0.077	0.077
Poultry – layer	0.35	0.35	6.2❺❼	2.2❻❽	017	0.17	0.15	0.15

❶ Highest maximum beef or dairy cattle dietary burden suitable for MRL estimates for mammalian tissues

❷ Highest maximum dairy cattle dietary burden suitable for MRL estimates for mammalian milk

❸ Highest mean beef or dairy cattle dietary burden suitable for STMR estimates for mammalian tissues.

❹ Highest mean dairy cattle dietary burden suitable for STMR estimates for milk.

❺ Highest maximum poultry dietary burden suitable for MRL estimates for poultry tissues.

❻ Highest mean poultry dietary burden suitable for STMR estimates for poultry tissues.

❼ Highest maximum poultry dietary burden suitable for MRL estimates for poultry eggs.

❽ Highest mean poultry dietary burden suitable for STMR estimates for poultry eggs.

Animal commodity maximum residue levels

Cattle

Residues in tissues and milk at the expected dietary burden for dairy cattle are shown in the Table below.

Table 7 Maximum residue level, STMR and HR in mammalian animal commodities

	Feed Level (ppm) for milk residues	Total residues (mg eq/kg) in milk	Feed Level (ppm) for tissue residues	Total residues (mg eq/kg)			
				Muscle	Liver	Kidney	Fat
MRL Determination (beef or dairy cattle)							
Feeding Study	15	< 0.01	15	< 0.01	0.02	< 0.01	0.01
	45	< 0.01	45	< 0.01	0.05	< 0.01	0.05
Dietary burden and estimate of highest residue	42	< 0.01	44	< 0.01	0.05	< 0.01	0.05
HR Determination (beef or dairy cattle)							
Feeding Study			15 45	< 0.02 < 0.02	0.08 0.44	0.08 0.30	0.03 0.07
Dietary burden and estimate of highest residue			44	< 0.02	0.43	0.29	0.069
STMR Determination (beef or dairy cattle)							
Feeding Study	15	< 0.02	15	< 0.02	0.06	0.07	0.02
Dietary burden and estimate of highest residue	10	< 0.02	11	< 0.02	0.044	0.051	0.015

Based on pydiflumetofen residues in milk and cattle tissues, the Meeting estimated a maximum residue level of 0.01 (*) mg/kg in milk, 0.1 mg/kg in mammalian meat (in the fat), mammalian edible offal and mammalian fat.

Based on the highest estimated total residues of pydiflumetofen and 2,4,6-TCP expressed as pydiflumetofen in muscle and fat, the Meeting estimated HR values of 0.02 mg/kg in mammalian meat and 0.069 mg/kg in mammalian fat.

Based on the highest estimated total residues of pydiflumetofen, 2,4,6-TCP and SYN547897 expressed as pydiflumetofen in liver and kidney, the Meeting estimated an HR value of 0.43 mg/kg in mammalian edible offal.

Based on the mean estimated total residues of pydiflumetofen and 2,4,6-TCP expressed as pydiflumetofen in milk, muscle and fat, the Meeting estimated STMR values of 0.02 mg/kg in milk, 0.02 mg/kg in mammalian meat and 0.015 mg/kg in mammalian fat.

Based on the mean estimated total residues of pydiflumetofen, 2,4,6-TCP and SYN547897 expressed as pydiflumetofen in liver and kidney, the Meeting estimated an STMR value of 0.051 mg/kg in mammalian edible offal.

Poultry

Residues in tissues and eggs at the expected dietary burden for laying hen are shown in the Table below.

Table 8 Maximum residue level, STMR and HR in poultry commodities

	Feed Level (ppm) for egg residues	Total residues (mg eq/kg) in egg	Feed Level (ppm) for tissue residues	Total residues (mg eq/kg)		
				Muscle	Liver	Fat
MRL Determination (poultry broiler or layer)						
Feeding Study	3	< 0.01	3	< 0.01	< 0.01	< 0.01
	9	0.011	9	< 0.01	< 0.01	< 0.01
Dietary burden and estimate of highest residue	6.2	0.011	6.2	< 0.01	< 0.01	< 0.01
HR Determination (poultry broiler or layer)						
Feeding Study	3	< 0.02	3	< 0.02	< 0.02	< 0.02
	9	0.023	9	< 0.02	< 0.02	< 0.02
Dietary burden and estimate of highest residue	6.2	0.022	6.2	< 0.02	< 0.02	< 0.02
STMR Determination (poultry broiler or layer)						
Feeding Study	3	< 0.02	3	< 0.02	< 0.02	< 0.02
Dietary burden and estimate of highest residue	2.2	< 0.02	2.2	< 0.02	< 0.02	< 0.02

Based on pydiflumetofen residues in eggs and poultry tissues, the Meeting estimated a maximum residue level of 0.02 mg/kg in eggs, 0.01 (*) mg/kg in poultry meat, poultry edible offal and poultry fat.

Based on the highest estimated total residues of pydiflumetofen and 2,4,6-TCP expressed as pydiflumetofen in eggs, muscle, liver and fat, the Meeting estimated HR values of 0.03 mg/kg in eggs, 0.02 mg/kg in poultry meat, 0.02 mg/kg in poultry, edible offal of and 0.02 mg/kg in poultry fat.

Based on the mean estimated total residues of pydiflumetofen and 2,4,6-TCP expressed as pydiflumetofen in eggs, muscle, liver and fat, the Meeting estimated STMR values of 0.02 mg/kg in eggs, poultry meat, poultry, edible offal of and poultry fat.

RECOMMENDATIONS

On the basis of the data obtained from supervised trials, the Meeting concluded that the residue levels listed below in Tables 9 and 10 are suitable for establishing maximum residue limits and for IEDI and IESTI assessments.

Definition of the residue for compliance with the MRL and dietary risk assessment for plant commodities: *Pydiflumetofen*

Definition of the residue for compliance with the MRL for animal commodities: *Pydiflumetofen*

Definition of the residue for estimation of dietary exposure for animal commodities other than mammalian liver and kidney: *Sum of pydiflumetofen and 2,4,6-trichlorophenol (2,4,6-TCP) and its conjugates, expressed as pydiflumetofen*

Definition of the residue for estimation of dietary exposure for mammalian liver and kidney: *Sum of pydiflumetofen, 2,4,6-trichlorophenol (2,4,6-TCP) and its conjugates, and 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichloro-3-hydroxy- phenyl) ethyl]pyrazole-4-carboxamide (SYN547897) and its conjugates, expressed as pydiflumetofen*

The residue is fat-soluble.

Table 9 Residue levels suitable for establishing maximum residue limits and for IEDI and IESTI assessments

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
GC 2087	Barley, similar grains, and pseudocereals with husks, subgroup of (includes all commodities in subgroup 020B)	3		0.23	
AS 0640	Barley straw and fodder, dry	50 (dw)		Median: 9.2 (dw)	Highest: 40 (dw)
VB 0040	Brassica vegetables (except Brassica leafy vegetables), group of (includes all commodities in this group)	0.1		0.02	0.09
SO 0691	Cottonseed	0.3		0.08	
VD 2065	Dry beans, subgroup of (includes all commodities in this subgroup)	0.4		0.028	
VD 2066	Dry peas, subgroup of (includes all commodities in this subgroup)	0.4		0.028	
MO 0105	Edible offal (Mammalian)	0.1		Liver: 0.044 Kidney: 0.051	Liver: 0.43 Kidney: 0.29
PE 0112	Eggs	0.02		0.02	0.03
VC 0045	Fruiting vegetables, Cucurbits, group of (includes all commodities in this group)	0.4		0.12	0.27
VO 0050	Fruiting vegetables, other than Cucurbits, group of (includes all commodities in this group) except Martynia, Okra and Roselle	0.5		0.11	0.42
VL 2050	Leafy greens, subgroup of (includes all commodities in this subgroup)	40		12.5	17
VL 0054	Leaves of Brassicaceae, subgroup of (includes all commodities in this subgroup)	0.1		0.02	0.09
VL 2052	Leaves of root and tuber vegetables, subgroup of (includes all commodities in this subgroup) except leaves of tuber vegetables	0.07		0.02	0.05
AL 0157	Legume animal feeds	30 (dw)		Median: 9.2 (dw)	Highest: 15 (dw)
VP 0060	Legume vegetables, group of (includes all commodities in this group)	0.02		0.02	0.02
GC 2091	Maize Cereals, subgroup of (includes all commodities in subgroup 020E)	0.04		0.03	
CF 1255	Maize flour	0.07		0.048	
AS 0645	Maize fodder	18 (dw)		3.1 (ar)	13 (ar)
OR 0645	Maize oil, edible	0.08		0.057	
VO 2709	Martynia	0.02		0.02	0.02
MF 0100	Mammalian fats (except milk fats)	0.1		0.015	0.069
MM 0095	Meat (from mammals other than marine mammals)	0.1(fat)		Muscle: 0.02 Fat: 0.015	Muscle: 0.02 Fat: 0.069
ML 0106	Milks	0.01(*)		0.02	
AS 0646	Millet fodder, dry	0.3 (dw)		Median: 0.08 (ar)	Highest:0.28 (ar)
AS 0647	Oat straw and fodder, dry	50 (dw)		Median: 9.2 (dw)	Highest: 40 (dw)
VO 0442	Okra	0.02		0.02	0.02
SO 0697	Peanut	0.05		0.03	
OR 0697	Peanut oil, edible	0.15		0.072	
HS 0444	Peppers, Chili, dried	5		1.1	4.2
DV 0589	Potato, dried	0.5		0.13	0.36
PO 0111	Poultry, Edible offal of	0.01(*)		0.02	0.02
PF 0111	Poultry fats	0.01(*)		0.02	0.02
PM 0110	Poultry meat	0.01(*)		0.02	0.02
GC 2088	Rice cereals, subgroup of (includes all	0.03		0.03	

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
	commodities in subgroup 020C)				
AS 0649	Rice straw and fodder, dry	0.3 (dw)		Median: 0.08 (ar)	Highest:0.28 (ar)
VR 2070	Root vegetables, subgroup of (includes all commodities in this subgroup)	0.1		0.02	0.07
VO 0446	Roselle	0.02		0.02	0.02
AS 0650	Rye straw and fodder, dry	50 (dw)		Median: 9.2 (dw)	Highest: 40 (dw)
SO 2090	Small seed oilseeds, subgroup of (includes all commodities in this subgroup)	0.9		0.0945	
GC 2089	Sorghum Grain and Millet, subgroup of (includes all commodities in subgroup 020D)	0.03		0.03	
AS 0651	Sorghum straw and fodder, dry	0.3 (dw)		Median: 0.08 (ar)	Highest:0.28 (ar)
VS 2080	Stems and petioles, subgroup of (includes all commodities in this subgroup)	15		4.4	9.3
SO 2091	Sunflower seeds, subgroup of (included all commodities in this group)	0.3		0.08	
GC 2090	Sweet Corns, subgroup of (includes all commodities in subgroup 020F)	0.03		0.03	0.03
DV 0448	Tomato, dried	7		1.2	4.4
AS 0653	Triticale straw and fodder, dry	50 (dw)		Median: 9.2	Highest: 40
VR 2071	Tuberous and corm vegetables, subgroup of (includes all commodities in this subgroup)	0.1		0.03	0.084
CM 0654	Wheat bran, processed	1		0.14	
CF 1211	Wheat germ	0.6		0.091	
GC 2086	Wheat, similar grains, and pseudocereals without husks, subgroup of (includes all commodities in subgroup 020A)	0.4		0.063	
AS 0654	Wheat straw and fodder, dry	50 (dw)		Median: 9.2 (dw)	Highest: 40 (dw)
	Tomato, canned			0.005	0.019
	Tomato juice (pasteurised)			0.005	
	Tomato paste			0.075	
	Tomato puree			0.037	
	Tomato wet pomace			0.43	
	Soya bean refined oil			0.005	
	Miso			0.004	
	Soya bean milk			0.002	
	Soya bean flour			0.002	
	Soya sauce			0.002	
	Tofu			0.004	
	Potato, boiled (peeled)			0.014	0.038
	Potato, baked (unpeeled)			0.014	0.038
	Potato chips			0.014	
	Potato crisps			0.014	
	Potato starch			0.014	
	Potato flakes			0.014	
	Wheat, wholemeal bread			0.027	
	Wheat flour			0.020	
	Wheat starch			0.002	
	Wheat gluten			0.11	
	Barley bran			0.083	
	Barley flour			0.053	
	Pearled barley			0.010	

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
	Oats bran			0.003	
	Oats flour			0.011	
	Rolled oats			0.003	
	Maize bran			0.14	
	Maize grits			0.013	
	Maize germs			0.063	
	Maize meal			0.028	
	Maize starch			0.013	
	Rape seed refined oil			0.035	

(ar) – as received; (dw) – dry weight

Table 10 Additional values used in estimating livestock dietary burdens.

Codex classification	Commodity	Median residue (-P) (mg/kg)	Highest residue (-P) (mg/kg)
Grape	Grape wet pomace	0.87	
Brassica vegetables	Head cabbage leaves	0.02	0.09
Fruiting vegetables, other than Cucurbits	Tomato wet pomace	0.43	
Brassica leafy vegetables	Kale leaves	0.02	0.09
Leaves of root and tuber vegetables	Turnip tops	0.02	0.02
	Sugar beet tops	0.02	0.02
Pulses	Beans (dry) seed, Cowpea seed, Lupin seed, Field pea (dry) seed, Soya bean (dry) seed, Vetch seed	0.028	
	Soya bean aspirated grain fractions	3.9	
	Soya bean meal	0.002	
	Soya bean hulls	0.092	
	Soya bean pollard	0.009	
Root vegetables	Carrot culls, Swede roots, Turnip roots	0.02	0.07
	Potato dried pulp	0.13	
	Potato process waste (wet peel)	0.063	
Tuberous and corn vegetables	Cassava roots, Potato culls	0.03	0.084
Wheat, similar grains, and pseudocereals without husks	Rye grain, Triticale grain, Wheat grain	0.063	
	Wheat aspirated grain fractions	23	
	Wheat gluten meal	0.12	
	Wheat milled byproduct	0.38	
Barley, similar grains, and pseudocereals with husks	Barley grain, Oats grain	0.23	
	Barley bran fractions	0.083	
Maize Cereals	Maize grain, Popcorn grain,	0.03	
	Maize aspirated grain fractions	2.1	
	Maize milled byproduct	0.066	
	Maize meal	0.028	
	Maize gluten	0.039	
	Maize gluten meal	0.096	
Small seed oilseeds	Rape seed meal	0.009	

Codex classification	Commodity	Median residue (-P) (mg/kg)	Highest residue (-P) (mg/kg)
Peanut	Peanut meal	< 0.012	
Legume animal feeds	Forage of legume animal feeds	0.88 (as received)	2.8 (as received)
	Fodder of legume animal feeds	9.2 (dry weight)	15 (dry weight)
Straw and fodder of cereal grains	Straw and fodder of barley, oats, rye triticale, and wheat	9.2 (dry weight)	40 (dry weight)
	Maize fodder	3.1 (as received)	13 (as received)
	Straw and fodder of cereal grains, except barley, oats, rye, triticale, wheat and maize	0.08 (as received)	0.28 (as received)
Forage of cereal grains [a]	Forage of barley and oats	1.95	7.0
	Forage of rye, triticale and wheat	2.7	11
	Maize forage	1.15	4.9
	Sweet corn forage	0.775	3.9
	Forage of cereal grains, except barley, oats, rye, triticale, wheat and maize	0.03	0.03

[a] levels for cereal forage are presented on as received basis.

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for pydiflumetofen is 0–0.1 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for pydiflumetofen were estimated for the 17 GEMS/Food Consumption Cluster Diets using the STMR or STMR-P values estimated by the JMPR. The results are shown in Annex 3 of the 2019 JMPR Report.

The IEDIs ranged from 1–20% of the maximum ADI. The Meeting concluded that long-term dietary exposure to residues of pydiflumetofen from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The ARfD for pydiflumetofen is 0.3 mg/kg bw. The International Estimate of Short Term Intakes (IESTIs) for pydiflumetofen were calculated for the food commodities and their processed commodities for which HRs/HR-Ps or STMRs/STMR-Ps were estimated by the present Meeting and for which consumption data were available. The results are shown in Annex 4 of the 2019 JMPR Report.

The IESTIs were less than 100% of the ARfD, except for spinach (up to 140% for toddlers in the Netherlands), lettuce (up to 350% for children in China) and endive (up to 230% for children in the Netherlands). The Meeting concluded that acute dietary exposure to residues of pydiflumetofen from uses considered by the present Meeting may present a health concern for these commodities.

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