

PYRIPROXYFEN (200)

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EXPLANATION

Pyriproxyfen is classified as a juvenile hormone mimic that interferes with normal insect development and reproduction. Metamorphosis of immature life stages is affected, but adults are not directly controlled, although production of viable eggs is affected by transovarial activity. Pyriproxyfen is absorbed through the insect cuticle but may also act by ingestion.

Pyriproxyfen was first evaluated by the JMPR in 1999 and then in 2000 and 2001. In the 1999 evaluation for toxicity and residues an ADI of 0–0.1 mg/kg bw was established. The Meeting concluded that it was not necessary to establish an ARfD due to the low acute toxicity of pyriproxyfen.

The 1999 JMPR recommended the following residue definition for pyriproxyfen:

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

The residue is fat-soluble.

At the 2018 JMPR, where new uses of pyriproxyfen were evaluated, the Meeting considered the banana and mango trials approximating the critical GAPs insufficient to estimate maximum residue levels.

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USE PATTERN

Table 1 List of uses of pyriproxyfen

Crops	Country	Application detail					
		Rate	Growth stage at last treatment	Indoor/Outdoor	No.	Interval in days	Pre harvest interval (PHI) in days
Banana	Costa Rica	0.10 kg ai/ha	At infestation	Outdoor	4	20	0
Mango	Malaysia	0.005 kg ai/hL	At infestation	Outdoor	2	14	14

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

The 2019 JMPR did not receive supervised trials on bananas or mangos. In the following tables, the supervised trials reviewed by the 2018 Meeting are summarized:

Table 2 Residues of pyriproxyfen following spray treatment on bananas

Location, Year (variety)	Application				Residues, mg/kg			Report/Trial No., Reference, analytical method, validation data, storage period							
	kg ai/ha	Inter- val	kg ai/hL	Growth stage	Sample	DALA	Parent								
cGAP: Costa Rica; 4×0.10 kg ai/ha, 20 d RTI, 0 d PHI															
Costa Rica, Sixaola 2016 (Cavendish)	0.14	-	0.56	Fruiting	Whole fruit	0	0.083	B11399/15-CR11, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.56												
	0.14	14 d	0.56												
Costa Rica, Tortugero 2016 (Cavendish)	0.14	-	0.4	Fruiting	Whole fruit	0	0.1	B11399/15-CR12, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.4						Pulp	0	< 0.01				
	0.14	14 d	0.4									Peel	0	0.37	
Costa Rica, San Clemente 2016 (Cavendish)	0.14	-	0.47	Fruiting	Whole fruit	0	0.043	B11399/15-CR13, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.47												
	0.14	14 d	0.47												
Costa Rica, Martina 2016 (Cavendish)	0.14	-	0.47	Fruiting	Whole fruit	0	0.029	B11399/15-CR14, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.47												
	0.14	14 d	0.47												
Costa Rica, Puerto Viejo 2016 (Cavendish)	0.14	-	0.47	Fruiting	Whole fruit	0	0.018	B11399/15-CR15, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.47						Pulp	0	< 0.01				
	0.14	14 d	0.47									Peel	0	0.039	
Costa Rica, Cariari 2016 (Cavendish)	0.14	-	0.35	Fruiting	Whole fruit	0	0.080	B11399/15-CR16, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.35						Pulp	3	0.20				
	0.14	14 d	0.35									7	0.13		
														14	0.023
									14	0	< 0.01				
												14	< 0.01		
			Peel	0	0.28										
						14	0.11								
Costa Rica, El Carmen 2016 (Cavendish)	0.14	-	0.35	Fruiting	Whole fruit	0	0.056	B11399/15-CR17, PYRIP_015 Method: L-00.00-115 Storage period: 5 months							
	0.14	14 d	0.35												
	0.14	14 d	0.35												

Location, Year (variety)	Application				Residues, mg/kg			Report/Trial No., Reference, analytical method, validation data, storage period
	kg ai/ha	Interval	kg ai/hL	Growth stage	Sample	DALA	Parent	
Guatemala, Aldea Los Chatos 2016 (Cavendish)	0.14	-	0.56	Fruiting	Whole fruit	0	0.012	B11399/15-GU42, PYRIP_015 Method: L-00.00-115 Storage period: 5 months
	0.14	14 d	0.56					
	0.14	14 d	0.56					
					Pulp	0	< 0.01	
					Peel	0	< 0.01	

Note: The shortest distance between the crop field trials in Costa Rica was 26 km, rendering the trials independent

DALA: days after last application

Table 3 Residues of pyriproxyfen following spray treatment on mangos

Location, Year (variety)	Application				Residues, mg/kg			Report/Trial No., Reference, analytical method, validation data, storage period
	kg ai/ha	Interval	kg ai/hL	Growth stage	Sample	DALA	Parent	
cGAP : Malaysia; 2×0.005 kg ai/hL, 14 d interval, 14 d PHI								
Malaysia, Pedang 2012 (Chok-Anan)	0.056 0.059	- 14 d	0.005 0.005	Fruiting	Whole fruit	14	< 0.02, < 0.02 (<u>< 0.02</u>)	IR-4 PR No. 10990/12-MY01, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1 month
Malaysia, Masmago 2012 (Chok-Anan)	0.057 0.058	- 13 d	0.005 0.005	Fruiting	Whole fruit	14	< 0.02, < 0.02 (<u>< 0.02</u>)	IR-4 PR No. 10990/12-MY02, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1.5 months
Malaysia, Dulan 2013 (Chok-Anan)	0.052 0.053	- 13 d	0.005 0.005	Fruiting	Whole fruit	14	< 0.02, < 0.02 (<u>< 0.02</u>)	IR-4 PR No. 10990/12-MY03, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1.5 months
Malaysia, Serdang 2013 (Chok-Anan)	0.05 0.056	- 13 d	0.005 0.005	Fruiting	Whole fruit	14	< 0.02, < 0.02 (<u>< 0.02</u>)	IR-4 PR No. 10990/12-MY04, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1 month
Malaysia, Rawang 2014 (Chok-Anan)	0.054 0.054	- 15 d	0.005 0.005	Fruiting	Whole fruit	14	< 0.02, < 0.02 (<u>< 0.02</u>)	IR-4 PR No. 10990/12-MY06, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1 month

Location, Year (variety)	Application				Residues, mg/kg			Report/Trial No., Reference, analytical method, validation data, storage period
	kg ai/ha	Inter- val	kg ai/hL	Growth stage	Sample	DALA	Parent	
Malaysia, Dulan 2014 (Chok-Anan)	0.055	-	0.005	Fruiting	Whole fruit	0	< 0.02, < 0.02 (< 0.02)	IR-4 PR No. 10990/12- MY07, PYRIP_003, PYRIP_004, PYRIP_005 Method: L-00.00-115 Storage period: 1 month
	0.055	14 d	0.005			3	< 0.02, < 0.02 (< 0.02)	
						7	< 0.02, < 0.02 (< 0.02)	
						14	< 0.02, < 0.02 (< 0.02)	
						21	< 0.02, < 0.02 (< 0.02)	

DALA: days after last application

APPRAISAL

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Results of supervised residue trials on crops

Banana

The critical GAP for bananas is in Costa Rica with four foliar sprays of 0.12 kg ai/ha/application with a 20-day re-treatment interval (RTI) and a PHI of 0 days.

As none of the trials conducted in Costa Rica and Guatemala reflected the critical GAP, in regards to application rate and number of applications, and the proportionality approach could not be considered, the Meeting was unable to estimate a maximum residue level or STMR for banana.

Mango

The critical GAP for mangoes is in Malaysia with two foliar sprays of 0.005 kg ai/hL/application with a 2-week RTI and a PHI of 14 days.

Residues of parent pyriproxyfen in whole mango fruits treated in accordance with the critical GAP were (n = 6): < 0.02 mg/kg.

The Meeting estimated a maximum residue level of 0.02(*) mg/kg and a STMR of 0.02 mg/kg.

Residues in animal commodities

The Meeting noted that no commodities considered by the current Meeting are relevant for livestock animal feeding.

RECOMMENDATIONS

On the basis of the data obtained from supervised trials, the Meeting concluded that the residue levels listed below 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 and animal commodities: *pyriproxyfen*

The residue is fat-soluble.

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
FI 0345	Mango	0.02(*)	-	0.02	-

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for pyriproxyfen is 0–0.1 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for pyriproxyfen 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 0–1% of the maximum ADI. The Meeting concluded that long-term dietary exposure to residues of pyriproxyfen from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The 1999 JMPR decided that an ARfD for pyriproxyfen was unnecessary. The Meeting therefore concluded that the acute dietary exposure to residues of pyriproxyfen from the uses considered is unlikely to present a public health concern.

REFERENCES

Code	Author	Year	Title, Institute, Report reference
PYRIP_001	Borbón Martínez O.	2017	Magnitude of the residues of pyriproxyfen on banana; Report no.: IR-4 PR No. B11399
PYRIP_003	Keong, N.Ch.	2017	Pyriproxyfen: Magnitude of the residue on mango; Report no.: IR-4 PR No. 10990
PYRIP_004	Chuan Mun Choy, J.	2015	Analytical summary report to: Pyriproxyfen: Magnitude of the residue on mango; Report no.: IR-4 PR No. 10990
PYRIP_005	Fauzan bin Yunus, M.	2017	Analytical summary report to: Pyriproxyfen: Magnitude of the residue on mango; Report no.: IR-4 PR No. 10990