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GOSP
GLOBAL QUALITY
AND STANDARDS PROGRAMME

GLOBAL MRLS FOR PESTICIDES RESIDUES IN VIETNAMESE MANGO

Global Quality & Standard Programme - Vietnam

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Table of Contents

Table of contents.....	1
List of tables.....	1
Acronyms	2
1. Introduction	3
2. Active ingredients approved for use on mango in Vietnam	3
3. Active ingredients applied in Vietnamese mango sector.....	4
4. Comment on compliance.....	4
5. Current MRLs for mango in EU, CODEX, USA, and MOH.....	5
6. Asean MRLs for crops other than mango	26
7. LOD values for pesticide analysis applying QUECHERS method	43
8. Sources of additional data	64

List of Tables

Table 1. Active ingredients approved for use on mango in Vietnam.....	3
Table 2. Pesticide residues reported within EU RASFF in Vietnamese fruits and vegetables (2012-2019).....	4
Table 3. Current MRLs for mango set by various national and international authorities	6
Table 4. MARLS for different crop/pesticide combinations.....	26

Acronyms

AI	Active ingredient
ASEAN	The Association of South East Asian Nations
EU	The European Union
FFCR	Food Chemical Research Foundation
LOD	Limit of detection
MARD	Ministry of Agriculture and Rural Development
MOH	Ministry of Health
MRL	Maximum Residue Levels
PPD	Plan Protection Department
RASFF	Rapid Alert System for Food and Feed
UNIDO	United Nations Industrial Development Organization
USA	The United States of America

1. Introduction

This document provides a summary of data related to the Maximum Residue Limits (MRLs) for mango (and some other fruit and vegetable commodities) in different jurisdictions, including Vietnam and some prominent export markets.

It, therefore, provides a guideline to regulators and operators as to the concentration limits to be achieved for regulatory compliance for pesticide/crop combinations. This is essential knowledge to be able to determine whether the results of the analysis of a sample indicate a likelihood of compliance of the batch with the required degree (percentage) of confidence.

Since a test result below the MRL does not necessarily imply compliance of the batch, it should be noted that the action limit should be selected based on knowledge of the characteristics of the distribution of test results about the mean.

2. Active ingredients approved for use on mango in Vietnam

The following active ingredients (AI) are approved for use on mango. The list is published by the MARD in Annex 1: 19/2021/TT-BNNPTNT) dated Dec. 28, 2021 on Promulgating the List of Permissible and Banned Plant Protection Drugs in Vietnam

Table 1. Active ingredients approved for use on mango in Vietnam

Insecticides	Fungicides	Herbicide
Abamectin	Ascorbic acid	Dalapon
Avermectin	Azoxystrobin	
Azadirachtin	Bismethiazol	
Bacillus thuringiensis	Chitosan	
<i>Bacillus thuringiensis</i> var. kurstaki	Chlorothalonil	
Buprofezin	Citric acid	
Chlorflúazuron	Citrus oil	
Chlorpyrifos Methyl	Cytokinin	
Clothianidin	Cytosinepeptidemycin	
Dinotefuran	Fenbuconazole	
Emamectin benzoate	Folpet	
Liuyangmycin	Fosetyl-aluminium	
Matrine	Gentamicin sulfate	
Oxymatrine	Hexaconazole	
Petroleum oil	Humic acid	
Rotenone	Kasugamycin	
Saponin	Lactic acid	
Saponin acid	Mancozeb	

Sapozozit	Mandipropamid	
Spinetoram	Ningnanmycin	
Spinosad	Oxytetracycline hydrochloride	
	Polyoxin	
	Propineb	
	Protein amylose	
	Streptomyces lydicus	
	Streptomycin sulfate	
	Sulfur	
	Tebuconazole	
	Tricyclazole	
	Trifloxystrobin	

3. Active ingredients applied in the Vietnamese mango sector

It is instructive to compare the list in Table 1 with the only evidence available concerning the actual range of active ingredients applied to Vietnamese mango. The data in Table 2 is based on analysis of test data on samples taken at the Border Control on entry to the EU¹, and reported to the RASFF system.

Table 2. Pesticide residues reported within EU RASFF in Vietnamese fruits and vegetables (2012-2019)

Acephate	Ethion	Permethrin
Azoxystrobin	Diafenthiuron	Profenofos
Carbofuran	Dithiocarbamates	Propargite
Carbendazim	Fenpropathrin	Propiconazole
Chlorfenapyr	Fipronil	Pyraclostrobin
Chlorfluazuron	Hexaconazole	Quinalphos
Chlorpyrifos	Iprodione	Spirotetramat
Chlorothalonil	Methamidophos	Tricyclazole
Dimethoate	Phenthoate	

Note: Chlorpyrifos banned from February 12, 2021, issued according to Circular 10/2020; September 9, 2020.

4. Comment on compliance

It is notable that only four of the 26 active compounds used by Vietnamese mango producers in the period (as highlighted in the table) were authorized for use by PPD. Carbendazim, fipronil, iprodione, and methamidophos are not even included in the list of authorized active

¹ Test results from samples taken in previous ad hoc national monitoring implemented by PPD of MARD were not made available to UNIDO

substances published by the MARD on 28th of May 2021: Moreover, Chlorpyrifos is banned from February 12, 2021. Pesticide treatments are conducted with little apparent regard to the law.

The main compliance challenge facing the PPD is to ensure that only pesticides containing active ingredients for that particular crop are applied. This requires a) understanding of which preparations contain which actives and b) communication of data on which preparations and dosage conditions may be applied to each crop.

There is no data available on the extent of compliance with MRLs, whether Vietnamese (set by the Ministry of Health) or whether set by the Competent Authorities of export countries.

5. Current MRLs for mango in EU, Codex, USA and MOH

Current MRLs for mango set by Competent Authorities in the EU¹, USA, and Vietnam (set by MoH) as well as those established by Codex Alimentarius, are shown in Table 3.

The reported MRLs are the latest published by the referenced organizations. The MRLs might be changed in time. The reader is advised to check the latest versions of the published MRLs.

Sources of this data are as follows:

1. Pesticides Web Version - EU MRLs (File created on 06/07/2022) <https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/products/?event=search.pr>
2. List of active ingredients in plant protection products approved in Vietnam for use in mango (Extracted from CIRCULAR 19/2021/MARD)
3. Codex Alimentarius Commission MRLs in/on Mango: <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/pesticides/en/>
4. ASEAN Secretariate website is currently out of order (the reported values were obtained earlier)
5. MRLs List of Japan from the FFCR website (A search engine for MRLs of Agricultural Chemicals in Foods) see <http://db.ffcr.or.jp/front/>
6. MRLs in USA: <https://www.epa.gov/sites/default/files/2015-01/documents/tolerances-commodity.pdf>
<https://www.epa.gov/pesticide-tolerances/tolerances-commodity-crop-group-or-crop-subgroup-index>

MRLs marked with an asterisk (*) indicate that the residue level should be below the marked figure (e.g.0.01*). In practice, it means that no detectable residue should be present in the sampled commodity.

The MRL lists of Japan and USA are inclusive. Residues which have no MRL should not be present in mango samples.

Table 3. Current MRLs for mango set by various national and international authorities

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
1,1-dichloro-2,2-bis(4-ethylphenyl) ethane (F)	0.01*					
1,2-dibromoethane (ethylene dibromide) (F)	0.01*					
1,2-dichloroethane (ethylene dichloride) (F)	0.01*					
4 Chlorophenoxyacetic acid *4/CPA					0.02	
1,3-Dichloropropene	0.01*					
1,4-Dimethylnaphthalene						
1-Naphthylacetamide and 1-naphthylacetic acid (sum of 1-naphthylacetamide and 1-naphthylacetic acid and its salts, expressed as 1-naphthylacetic acid)	0.06*					
1-methylcyclopropene	0.01*					
2,4,5-T (sum of 2,4,5-T, its salts and esters, expressed as 2,4,5-T) (F)	0.01*					
2,4-D (sum of 2,4-D, its salts, its esters, and its conjugates, expressed as 2,4-D)	0.05*					
2,4-DB (sum of 2,4-DB, its salts, its esters and its conjugates, expressed as 2,4-DB) (R)	0.01*					
2,5-dichlorobenzoic acid methylester (sum of 2,5-dichlorobenzoic acid and its ester expressed as 2,5-dichlorobenzoic acid methylester)	0.01*					
2-amino-4-methoxy-6-(trifluoromethyl)-1,3,5-triazine (AMTT), resulting from the use of tritosulfuron (F)	0.01*					
2-naphthoxyacetic acid	0.01*					
2-phenylphenol (sum of 2-phenylphenol and its conjugates, expressed as 2-phenylphenol) (R) (F)	0.01*					
3-decen-2-one	0.1*					
8-hydroxyquinoline (sum of 8-hydroxyquinoline and its salts, expressed as 8-hydroxyquinoline)	0.01*					
Abamectin (sum of avermectin B1a, avermectin B1b and delta-8,9 isomer of avermectin B1a, expressed as avermectin B1a) (R) (F)	0.01*	+	0.01		0.01	
Acephate	0.01*					
Acequinocyl	0.01*				0.5	
Acetamiprid (R)	0.01*				1	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Acetochlor	0.01*					
Acibenzolar-S-methyl (sum of acibenzolar-S-methyl and acibenzolar acid (free and conjugated), expressed as acibenzolar-S-methyl)	0.6		0.06			
Aclonifen	0.01*					
Acrinathrin (F)	0.02*				0.3	
Alachlor	0.01*					
Alanycarb					2	
Aldicarb (sum of aldicarb, its sulfoxide and its sulfone, expressed as aldicarb)	0.02*					
Aldrin and Dieldrin (Aldrin and dieldrin combined expressed as dieldrin) (F)	0.01*				-	
Ametctradin (R), (F)	0.01*					
Amidosulfuron (R) (A)	0.01*					
Amisulbrom	0.01*					
Amitraz (amitraz including the metabolites containing the 2,4 -dimethylaniline moiety expressed as amitraz)	0.05*					
Amitrole	0.01*					
Anilazine	0.01*					
Anthraquinone (F)	0.01*					
Aramite (F)	0.01*					
Asulam	0.05*					
Atrazine (F)	0.05*				0.02	
Azadirachtin	0.01*	+				
Azimsulfuron	0.01*					
Azinphos-ethyl (F)	0.02*					
Azinphos-methyl (F)	0.01*					
Azocyclotin and Cyhexatin (sum of azocyclotin and cyhexatin expressed as cyhexatin)	0.01*					
Azoxystrobin	4.0	0.7	0.7		1	2
Barban (F)	0.01*					
Beflubutamid	0.02*					
Benalaxyl including other mixtures of constituent isomers, including benalaxyl-M (sum of isomers)	0.01*				0.05	
Benfluralin (F)	0.02*					
Benfuracarb					-	
Bensulfuron-methyl	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Bensulide					-	
Bentazone (Sum of bentazone, its salts, and 6-hydroxy (free and conjugated) and 8-hydroxy bentazone (free and conjugated), expressed as bentazone) (R)	0.03*				0.02	
Benthiavalicarb (Benthiavalicarb-isopropyl (KIF-230 R-L) and its enantiomer (KIF-230 S-D) and its diastereomers (KIF-230 S-L and KIF-230 R-D), expressed as benthiavalicarb-isopropyl) (A)	0.01*					
Benzalkonium chloride (mixture of alkylbenzyltrimethylammonium chlorides with alkyl chain lengths of C8, C10, C12, C14, C16, and C18)	0.1					
Benzovindiflupyr	0.01*					
Bicyclopyrone (sum of bicyclopyrone and its structurally related metabolites determined as the sum of the common moieties 2-(2-methoxyethoxymethyl)-6-(trifluoromethyl)pyridine-3-carboxylic acid (SYN503780) and (2-(2-hydroxyethoxymethyl)-6-(trifluoromethyl)pyridine-3-carboxylic acid (CSCD686480), expressed as bicyclopyrone)						
Bifenazate (sum of bifenazate plus bifenazate-diazene expressed as bifenazate) (F)	0.02*				0.2	7
Bifenox (F)	0.01*					
Bifenthrin (sum of isomers) (F)	0.5		0.1		0.3	
Bilanafos					0.004	
Bioresmethrin					0.1	
Biphenyl	0.01*					
Bispyribac (sum of bispyribac, its salts, and its esters, expressed as bispyribac)	0.01*					
Bismethiazole		+				
Bitertanol (sum of isomers) (F)	0.01*		0.5		0.05	
Bixafen	0.01*					
Bone oil	0.01*					
Boscalid (R) (F)	0.01*	+	0.6			1.5
Brodifacoum					0.001	
Bromadiolone	0.01*					
Bromide ion	50.0				20	20 ^A
Bromophos-ethyl (F)	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Bromopropylate (F)	0.01*				2	
Bromoxynil and its salts, expressed as bromoxynil	0.01*					
Bromuconazole (sum of diastereoisomers) (F)	0.01*					
Bupirimate (R) (F) (A)	0.01*					
Buprofezin (F)	0.01*	0.1	0.1		0.9	0.9
Butralin	0.01*					
Butafenacil					0.1	
Butralin	0.01*					
Butylate	0.01*					
Cadusafos	0.01*		0.01			
Camphechlor (Toxaphene) (R) (F)	0.01*					
Captafol (F)	0.02*					
Captan (Sum of captan and THPI, expressed as captan) (R)	0.03*				5	
Carbaryl (F)	0.01*			3	-	
Carbendazim and benomyl (sum of benomyl and carbendazim expressed as carbendazim) (R)	0.5		5	5	2	
Carbetamide (sum of carbetamide and its S isomer)	0.01*					
Carbofuran (sum of carbofuran (including any carbofuran generated from carbosulfan, benfuracarb or furathiocarb) and 3-OH carbofuran expressed as carbofuran) (R)	0.01*		0.01		-	
Carbosulfan					-	
Carbon monoxide	0.01*					
Carbon tetrachloride						
Carboxin (carboxin plus its metabolites carboxin sulfoxide and oxycarboxin (carboxin sulfone), expressed as carboxin)	0.03*					0.1
Carfentrazone-ethyl (sum of carfentrazone-ethyl and carfentrazone, expressed as carfentrazone-ethyl) (R)	0.02*				0.1	0.1
Cartap					--	
Chlorantraniliprole (DPX E-2Y45) (F)	0.01*					4
Chlorate (A)	0.3					
Chlorbenside (F)	0.01*					
Chlorbufam (F)	0.01*					
Chlordane (sum of cis- and trans-chlordane) (R) (F)	0.01*				0.02	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Chlordecone (F)	0.02					
Chlorfenapyr	0.01*				0.3	
Chlorfenson (F)	0.01*					
Chlorfenvinphos (F)	0.01*				0.05	
Clorfluazuron		+			-	
Chloridazon (sum of chloridazon and chloridazon-desphenyl, expressed as chloridazon) (R)	0.1*					
Chlormequat (sum of chlormequat and its salts, expressed as chlormequat-chloride)	0.01*					
Chlorobenzilate (F)	0.02*					1
Chloropicrin	0.005*					
Chlorothalonil (R)	0.01*	+	15		0.5	1
Chlorotoluron	0.01*					
Chloroxuron (F)	0.01*					
Chlorpropham (R) (F)	0.01*					
Chlorpyrifos (F)	0.01*		2			
Chlorpyrifos-methyl (R) (F)	0.01*	0.04	0.01		0.05	
Chlorsulfuron	0.05*					
Chlorthal-dimethyl	0.01*					
Chlorthiamid	0.01*					
Chlozolate (F)	0.01*					
Chromafenozide	0.01*					
Cinidon-ethyl (sum of cinidon ethyl and its E-isomer)	0.05*					
Clethodim (sum of Sethoxydim and Clethodim including degradation products calculated as Sethoxydim)	0.1					
Clodinafop and its S-isomers and their salts, expressed as clodinafop (F)	0.02*				0.02	
Clofentezine (R)	0.02*					
Clomazone	0.01*				0.02	
Clopidol					0.2	
Clopyralid	0.5					
Clothianidin	0.04	0.04	0.04		1	0.04
Copper compounds (Copper)	20.0					
Copper nonyphenolsulfonate					5	
Coumaphos						
Cyanamide, including salts expressed as cyanamide	0.01*					
Cyanophos					-	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Cyantraniliprole	0.7		7			
Cyazofamid	0.01*					
Cyclanilide (F)	0.05*					
Cyclaniliprole	0.01*					
Cycloxydim including degradation and reaction products which can be determined as 3-(3-thianyl) glutaric acid S-dioxide (BH 517-TGSO ₂) and/or 3-hydroxy-3-(3-thianyl) glutaric acid S-dioxide (BH 517-5-OH-TGSO ₂) or methyl esters thereof, calculated in total as cycloxydim	0.2				0.05	
Cyflufenamid (sum of cyflufenamid (Z-isomer) and its E-isomer, expressed as cyflufenamid) (R) (A)	0.01*					
Cyflumetofen						
Cyfluthrin (cyfluthrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.02*				0.02	
Cyhalofop-butyl	0.02*					
Cyhaothrin				0.2	0.5	
Cymoxanil	0.01*					
Cypermethrin (cypermethrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.7		0.7	0.7	0.7	
Cyproconazole (F)	0.05*					
Cyprodinil (R) (F)	0.02*				1	1.2
Cyromazine	0.05*		0.5		0.5	0.3
DBEDC Dodecylbenzenesulphonic acid bisethylenediamine copper [II] salt					0.5	
DCIP 2,2'-oxybis (1-chloropropane)					-	
DDT (sum of p,p'-DDT, o,p'-DDT, p-p'-DDE and p,p'-TDE (DDD) expressed as DDT) (F)	0.05*				0.5	
DNOC	0.01*					
Dalapon	0.05*	+				
Daminozide (sum of daminozide and 1,1-dimethyl-hydrazine (UDHM), expressed as daminozide)	0.06*					
Dazomet (Methylisothiocyanate resulting from the use of dazomet and metam)	0.02*					
Deltamethrin (cis-deltamethrin) (F)	0.01*			0.2	-	
Demethon_S-methyl					0.4	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Denatonium benzoate (sum of denatonium and its salts, expressed as denatonium benzoate)	0.01*					
Desmedipham	0.01*					
Di-allate (sum of isomers) (F)	0.01*					
Diazinon (F)	0.01*					
Diafenthiurom					0.02	
Dicamba	0.05*					
Diazinon	0.01*				-	
Dichlobenil	0.01*					
Dichlofluanid					5	
Dichlorprop (Sum of dichlorprop (including dichlorprop-P), its salts, esters, and conjugates, expressed as dichlorprop) (R)	0.02*				-	
Dichlorvos	0.01*			0.1	0.1	
Dichlomezine					0.02	
Dicloran	0.01*					
Dicofol (sum of p, p' and o,p' isomers) (F)	0.02*				3	
Didecyldimethylammonium chloride (mixture of alkyl-quaternary ammonium salts with alkyl chain lengths of C8, C10 and C12)	0.1					
Dieéldrin					-	
Diethofencarb	0.01*					
Difenoconazole	0.1		0.07		0.07	0.07
Difenzoquat					0.05	
Diflubenzuron (R) (F)	0.01*				-	
Diflubenzopyr					0.05	
Diflufenican (F)	0.01*					
Difluoroacetic acid (DFA)	0.02*					
Dihydrosterptomycin, streptomycin					0.05	
Dimethachlor	0.01*					
Dimethenamid, including other mixtures of constituent isomers including dimethenamid-P (sum of isomers)	0.01*					
Dimethipin	0.05*				0.04	
Dimethoate	0.01*		1	1	1	
Dimethomorph (sum of isomers)	0.01*	+				
Dimoxystrobin (R) (A)	0.01*					
Diniconazole (sum of isomers)	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Dinocap (sum of dinocap isomers and their corresponding phenols expressed as dinocap) (Where only meptyldinocap or its corresponding phenol are detected but none of the other components constituting dinocap (including their corresponding phenols), the MRLs and residue definition of meptyldinocap are to be applied.) (F)	0.02*					
Dinoseb (sum of dinoseb, its salts, dinoseb-acetate and binapacryl, expressed as dinoseb)	0.02*					
Dinotefuran		+			1	
Dinoterb (sum of dinoterb, its salts and esters, expressed as dinoterb)	0.01*					
Dioxathion (sum of isomers) (F)	0.01*					
Diphenylamine	0.05*				0.05	
Diquat	0.01*		0.02		0.01	
Disulfoton (sum of disulfoton, disulfoton sulfoxide and disulfoton sulfone expressed as disulfoton) (F)	0.01*				0.05	
Dithianon	0.01*					
Dithiocarbamates (dithiocarbamates expressed as CS ₂ , including maneb, mancozeb, metiram, propineb, thiram and ziram)	2.0		2	2	2	15
Diuron	0.01*				0.05	
Dodemorph	0.01*					
Dodine	0.01*				0.2	
EPTC (ethyl dipropylthiocarbamate)	0.01*					
Emamectin benzoate B1a, expressed as emamectin	0.01*	+				
Endosulfan (sum of alpha- and beta-isomers and endosulfan-sulphate expressed as endosulfan) (F)	0.05*		0.5		0.5	
Endrin (F)	0.01*				0.01	
Epoxiconazole (F)	0.05*					
Ethalfluralin	0.01*					
Ethametsulfuron-methyl	0.01*					
Ethephon	0.05*				2	
Ethion	0.01*				0.3	
Ethirimol (R) (F) (A)	0.01*				0.5	
Ethriprole					0.5	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Ethylene dibromide					N.D.	
Ethylene dichloride					0.01	
Ethofumesate (Sum of ethofumesate, 2-keto-ethofumesate, open-ring-2-keto-ethofumesate and its conjugate, expressed as ethofumesate)	0.03*					
Ethoprophos	0.01*		0.02			
Ethoxyquin (F)	0.05*					
Ethoxysulfuron	0.01*					
Ethylene oxide (sum of ethylene oxide and 2-chloro-ethanol expressed as ethylene oxide) (F)	0.02*					
Etofenprox (F)	0.01*				5	
Etoxazole	0.01*				0.3	0.2
Etridiazole	0.05*					
Famoxadone (F)	0.01*					
Fenamidone	0.01*					
Fenamiphos (sum of fenamiphos and its sulphoxide and sulphone expressed as fenamiphos)	0.02*		0.05		0.02	
Fenarimol	0.02*		0.2		1	
Fenbuconazole (sum of constituent enantiomers)	0.01*	+	0.05			
Fenbutatin oxide (F)	0.01*		10		5	
Fenchlorphos (sum of fenchlorphos and fenchlorphos oxon expressed as fenchlorphos)	0.01*					
Fenhexamid (F)	0.01*					
Fenitrothion	0.01*					
Fenoxaprop-P	0.1				0.1	
Fenoxycarb	0.01*				0.05	
Fenpicoxamid (R) (F)	0.01*		0.15			
Fenpropathrin	0.01*				0.7	1
Fenpropidin (sum of fenpropidin and its salts, expressed as fenpropidin) (R) (A)	0.01*					
Fenpropimorph (sum of isomers) (R) (F)	0.01*		2		0.05	
Fenpyrazamine (F)	0.01*					
Fenpyroximate (R) (F) (A)	0.01*				1	
Fenthion (fenthion and its oxigen analogue, their sulfoxides, and sulfone expressed as parent) (F)	0.01*				5	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Fentin (fentin including its salts, expressed as triphenyltin cation) (F)	0.02*				0.05	
Fenvalerate (any ratio of constituent isomers (RR, SS, RS & SR) including esfenvalerate) (R) (F)	1.5		1.5	1	1	
Ferban						4 ^a
Fipronil (sum fipronil + sulfone metabolite (MB46136) expressed as fipronil) (F)	0.005*		0.005		-	
Flazasulfuron	0.01*				-	
Flometoquin					0.5	
Flonicamid (sum of flonicamid, TFNA and TFNG expressed as flonicamid) (R)	0.03*					
Florasulam	0.01*					
Florpyrauxifen-benzyl	0.01*					
Fluazifop-P (sum of all the constituent isomers of fluazifop, its esters and its conjugates, expressed as fluazifop)	0.01*		0.01			
Fluazinam (F)	0.01*					
Flubendiamide (F)	0.01*					
Flucycloxuron (F)	0.01*					
Flucythrinate (flucythrinate including other mixtures of constituent isomers (sum of isomers)) (F)	0.01*				0.05	
Fludioxonil (R) (F)	2.0		2		5	0.45
Flufenacet (sum of all compounds containing the N fluorophenyl-N-isopropyl moiety expressed as flufenacet)	0.05*					
Flufenoxuron (F)	0.01*				1	
Flufenzin	0.02*					
Flumequine						
Flumetralin (F)	0.01*					
Flumioxazine	0.02*					
Fluometuron	0.01*				0.02	
Fluopicolide	0.01*					
Fluopyram (R)	0.01*		1		0.05	
Fluoride ion	2.0*					
Fluoroglycofene	0.01*					
Fluoxastrobin (sum of fluoxastrobin and its Z-isomer) (R)	0.01*					
Flupyradifurone	0.01*					
Flupyrsulfuron-methyl	0.02*					
Fluquinconazole (F)	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Flurochloridone (sum of cis- and trans-isomers) (F)	0.01*					
Fluroxypyr (sum of fluroxypyr, its salts, its esters, and its conjugates, expressed as fluroxypyr) (R) (A)	0.01*				0.05	
Flurprimidole	0.01*					
Flurtamone	0.01*					
Flusilazole (R) (F)	0.01*					
Flutianil	0.01*					
Flutolanil (R)	0.01*					
Flutriafol	0.01*					
Fluvalinate (sum of isomers) resulting from the use of tau-fluvalinate (F)	0.01*					
Fluxapyroxad (F)	0.7		0.6		0.7	
Folpet (sum of folpet and phtalimide, expressed as folpet) (R)	0.03*					
Fomesafen	0.01*	+				
Foramsulfuron	0.01*					
Forchlorfenuron	0.01*				0.1	
Formetanate: Sum of formetanate and its salts expressed as formetanate (hydrochloride)	0.01*					
Formothion	0.01*					
Fosetyl-Al (sum of fosetyl, phosphonic acid, and their salts, expressed as fosetyl)	2.0*				50	
Fosthiazate	0.02*					
Fuberidazole	0.01*					
Furathiocarb					-	
Furfural	1.0					
Fluxapyroxad			0.6			
Gentamicin sulphate		+				
Glufosinate (sum of glufosinate isomers, its salts and its metabolites 3-[hydroxy(methyl)phosphinoyl] propionic acid (MPP) and N-acetyl-glufosinate (NAG), expressed as glufosinate)	0.1				0.1	
Glyphosate	0.1*				0.2	0.2
Guazatine (guazatine acetate, sum of components)	0.05*					
Halauxifen-methyl (sum of halauxifen-methyl and X11393729 (halauxifen), expressed as halauxifen-methyl)	0.02*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Halosulfuron methyl	0.01*					
Haloxyfop (Sum of haloxyfop, its esters, salts and conjugates expressed as haloxyfop (sum of the R- and S- isomers at any ratio)) (R) (F)	0.01*				0.05	
Heptachlor (sum of heptachlor and heptachlor epoxide expressed as heptachlor) (F)	0.01*				-	
Hexachlorobenzene (F)	0.01*				0.01	
Hexachlorocyclohexane (HCH), alpha-isomer (F)	0.01*					
Hexachlorocyclohexane (HCH), beta-isomer (F)	0.01*					
Hexaconazole	0.01*	+				
Hexythiazox	0.5					
Hydrogen cyanide (cyanides expressed as hydrogen cyanide)					5	
Hydrogen phosphide					0.01	
Hymexazol	0.02*				0.5	
Imazalil (any ratio of constituent isomers) (R)	0.01*				2	
Imazaquin					0.05	
Imazetapyr ammonium					0.05	
Imazamox (Sum of imazamox and its salts, expressed as imazamox)	0.05*					
Imazapic	0.01*					
Imazapyr						
Imazaquin	0.05*				0.05	
Imazosulfuron	0.01*					
Imibenconazole		+				
Imidacloprid	0.01*		0.2	0.2	1	1
Iminocadine					1	
Indolyacetic acid	0.1*					
Indolybutyric acid	0.1*					
Indoxacarb (sum of indoxacarb and its R enantiomer) (F)	0.02*					
Iodosulfuron-methyl (sum of iodosulfuron-methyl and its salts, expressed as iodosulfuron-methyl)	0.01*					
Ioxynil (sum of ioxynil and its salts, expressed as ioxynil)	0.01*				0.1	
Ipconazole (F)	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Iprodione (R)	0.01*				10	
Iprovalicarb	0.01*	+				
Isofetamid	0.01*					
Isoprothiolane	0.01*					
Isoproturon	0.01*					
Isopyrazam	0.01*					
Isoxaben	0.02*					
Isoxaflutole (sum of isoxaflutole and its diketonitrile-metabolite, expressed as isoxaflutole)	0.02*					
Kasugamicin		+				
Kresoxim-methyl (R)	0.1	+	0.1		0.3	
Lactofen	0.01*				0.3	
Lambda-cyhalothrin (includes gamma-cyhalothrin) (sum of R, S, and S, R isomers) (F)	0.2					
Lenacil	0.1*				0.3	
Lindane (Gamma-isomer of hexachlorocyclohexane (HCH))	0.01*				1	
Linuron	0.01*				0.2	
Lufenuron (any ratio of constituent isomers) (F)	0.01*					
MCPA and MCPB (MCPA, MCPB including their salts, esters, and conjugates expressed as MCPA) (R) (F)	0.05*					
Malathion (sum of malathion and malaoxon expressed as malathion)	0.02*				8	8
Maleic hydrazide	0.2*				0.2	
Mancozeb		+				15
Mandestrobin	0.01*					
Mandipropamid (any ratio of constituent isomers)	0.01*					
Mecarbam	0.01*					
Mecoprop (sum of mecoprop-p and mecoprop expressed as mecoprop)	0.05*					
Mefentrifluconazole	0.01*					
Mepanipyrim	0.01*				1	
Mepiquat (sum of mepiquat and its salts, expressed as mepiquat chloride)	0.02*				-	
Mepronil	0.01*					
Meptyldinocap (sum of 2,4 DNOPC and 2,4 DNOP expressed as meptyldinocap)	0.05*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Mercury compounds (sum of mercury compounds expressed as mercury)	0.01*					
Mesosulfuron-methyl	0.01*					
Mesotrione	0.01*					
Metaflumizone (sum of E- and Z- isomers)	0.02*					
Metalaxyl and metalaxyl-M (metalaxyl including other mixtures of constituent isomers including metalaxyl-M (sum of isomers)) (R)	0.01*					0.4
Metaldehyde	0.05*					
Metamitron	0.01*					
Metazachlor (Sum of metabolites 479M04, 479M08 and 479M16, expressed as metazachlor) (R)	0.02*					
Metconazole (sum of isomers) (F)	0.02*				0.5	
Methabenzthiazuron	0.01*					
Methacrifos	0.01*					
Methamidophos	0.01*				-	
Methidathion	0.02*				0.2	0.05 ^a
Methiocarb (sum of methiocarb and methiocarb sulfoxide and sulfone, expressed as methiocarb)	0.03*				0.05	
Methomyl	0.01*				3	
Methoprene	0.02*					
Methoxychlor (F)	0.01*				0.01	
Methoxyfenozide (F)	0.01*					0.6
Metolachlor and S-metolachlor (metolachlor including other mixtures of constituent isomers including S-metolachlor (sum of isomers))	0.05*					
Metiram		+				
Metosulam	0.01*					
Metrafenone (F)	0.01*					
Metribuzin	0.1*					
Metsulfuron-methyl	0.01*					
Mevinphos (sum of E- and Z-isomers)	0.01*					
Milbemectin (sum of milbemycin A4 and milbemycin A3, expressed as milbemectin)	0.02*					
Molinate	0.01*					
Monocrotophos	0.01*					
Monolinuron	0.01*					
Monuron	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Myclobutanil (sum of constituent isomers) (R)	0.01*				1	3
Naled/dichlovos					0.1	
Napropamide (sum of isomers)	0.01*					
Nicosulfuron	0.01*					
Nicotine						
Nangamicin		+				
Nitenpyram					1	
Nitrofen (F)	0.01*					
Novaluron (F)	0.01*					
Omethoate	0.01*				1	
Orthosulfamuron	0.01*					
Oryzalin (F)	0.01*				0.1	
Oxadiargyl	0.01*				1	
Oxadiazon	0.01*					
Oxadixyl	0.01*				1	
Oxamyl	0.01*					
Oxasulfuron	0.01*					
Oxathiapiprolin	0.01*				0.1	
Oxine-copper					0.5	
Oxpoconazole-fumarate					-	
Oxycarboxin	0.01*					
Oxydemeton-methyl (sum of oxydemeton-methyl and demeton-S-methylsulfone expressed as oxydemeton-methyl)	0.01*				0.02	
Oxydemeton-methyl					0.02	
Oxyfluorfen	0.05*				0.05	
Oxpocanazole-fumarate					-	
Paclobutrazol (sum of constituent isomers)	0.01*				0.01	
Paraffin oil (CAS 64742-54-7)	0.01*					
Paraquat	0.02*				0.05	
Parathion (F)	0.05*				0.05	
Parathion-methyl (sum of Parathion-methyl and paraoxon-methyl expressed as Parathion-methyl)	0.01*				0.2	
Penconazole (sum of constituent isomers) (F)	0.01*				0.05	
Pencycuron (sum of pencycuron and pencycuron-PB-amine, expressed as pencycuron) (R) (F) (A)	0.02*					
Pendimethalin (F)	0.05*				0.05	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Penflufen (sum of isomers) (F)	0.01*					
Penoxsulam	0.01*					
Penthiopyrad	0.01*					
Permethrin (sum of isomers) (F)	0.05*				-	
Pethoxamid	0.01*					
Petroleum oils (CAS 92062-35-6)	0.01*					
Phenmedipham	0.01*					
Phenothrin (phenothrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.02*				-	
Phenthoate						
Phorate (sum of phorate, its oxygen analogue, and their sulfones expressed as phorate)	0.01*				0.05	
Phosalone	0.01*					
Phosmet (phosmet and phosmet oxon expressed as phosmet) (R)	0.05*				0.1	
Phosphamidon	0.01*				-	
Phosphane and phosphide salts (sum of phosphane and phosphane generators (relevant phosphide salts), determined and expressed as phosphane)	0.01*					
Phosphine						0.01
Phoxim (F)	0.01*				0.02	
Picloram	0.01*					
Picolinafen	0.01*					
Picoxystrobin (F)	0.01*					
Pindone					0.001	
Pinoxaden	0.02*					
Pirimicarb (R)	0.01*				0.5	
Piperonil butoxide					8	8
Pirimiphos-methyl (F)	0.01*				0.1	
Polyoxin-B		+				
Probenazole					-	
Prochloraz (sum of prochloraz, BTS 44595 (M201-04) and BTS 44596 (M201-03), expressed as prochloraz) (F)	0.03*				2	
Procymidone (R)	0.01*				0.5	
Profenofos (F)	0.2		0.2	0.2	0.2	
Profoxydim	0.01*					
Prohexadione (prohexadione (acid) and its salts expressed as prohexadione-calcium)	0.01*					

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Propachlor: oxalinic derivate of propachlor, expressed as propachlor	0.02*					
Propamocarb (Sum of propamocarb and its salts, expressed as propamocarb) (R)	0.01*					
Propanil	0.01*				-	
Propargite (F)	0.01*					
Propham	0.01*					
Propiconazole (sum of isomers) (F)	0.01*	+		0.05	-	
Propineb (expressed as propilendiamine)	0.05*					
Propisochlor	0.01*					
Propoxur	0.05*				1	
Propoxycarbazone (propoxycarbazone, its salts and 2-hydroxypropoxycarbazone expressed as propoxycarbazone) (A)	0.02*					
Propyzamide (R) (F)	0.01*					
Proquinazid (R) (F)	0.01*					
Prosulfocarb	0.01*					
Prosulfuron	0.01*					
Prothioconazole: prothioconazole-desthio (sum of isomers) (F)	0.01*	+				
Pymetrozine (R)	0.02*	+				
Pyraclostrobin (F)	0.6		0.6		0.05	0.6
Pyraflufen-ethyl (Sum of pyraflufen-ethyl and pyraflufen, expressed as pyraflufen-ethyl)	0.02*				0.02	
Pyrasulfotole	0.01*					
Pyrazolate					0.02	
Pyrazophos (F)	0.01*					
Pyrethrins	1.0				1	1
Pyridaben (F)	0.01*				0.7	0.1
Pyridalyl	0.01*					
Pyridate (sum of pyridate, its hydrolysis product CL 9673 (6-chloro-4-hydroxy-3-phenylpyridazin) and hydrolysable conjugates of CL 9673 expressed as pyridate)	0.05*					
Pyrimethanil (R)	0.01*					
Pyriofenone	0.01*					
Pyrifluquinazone					1	
Pyriproxyfen (F)	0.05*			0.02	1	1
Pyroxsulam	0.01*					
Quinalphos (F)	0.01*				0.02	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Quinclorac	0.01*					
Quinmerac	0.1*					
Quinoclamine	0.01*					
Quinoxifen (F)	0.02*					
Quintozene (sum of quintozene and pentachloro-aniline expressed as quintozene) (F)	0.02*				0.02	
Quizalofop (sum of quizalofop, its salts, its esters (including propaquizafof) and its conjugates, expressed as quizalofop (any ratio of constituent isomers))	0.01*					
Repellants: tall oil	0.01*					
Resmethrin (resmethrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.01*				0.1	
Rimsulfuron	0.01*					
Rotenone	0.01*	+				
Saflufenacil (sum of saflufenacil, M800H11 and M800H35, expressed as saflufenacil) (R)	0.03*	Spinetoram			0.03	0.03
Sedaxane (sum of isomers)	0.01*					
Silthiofam	0.01*					
Simazine	0.01*				0.1	
Sintofen	0.01*					
Sodium 5-nitroguaiacolate, sodium o-nitrophenolate and sodium p-nitrophenolate (Sum of sodium 5-nitroguaiacolate, sodium o-nitrophenolate and sodium p-nitrophenolate, expressed as sodium 5-nitroguaiacolate)	0.03*					
Spinetoram (sum of spinetoram-J and spinetoram)	0.02*	+	0.01	0.1	0.3	0.3
Spinosad (spinosad, sum of spinosyn A and spinosyn D) (F)	0.02*				0.3	0.3
Spirodiclofen (F)	1.0				1	1
Spiromesifen	0.02*	0.3				
Spirotetramat and spirotetramat-enol (sum of), expressed as spirotetramat (R)	0.3	+	0.3		0.3	0.3
Spiroxamine (sum of isomers) (R) (A)	0.01*					
Streptomycin					0.05	
Sulcotrione (R)	0.01*					
Sulfentrazone					0.05	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Sulfosulfuron	0.01*					
Sulfoxaflor (sum of isomers)	0.01*					
Sulfur		+				
Sulfuryl fluoride	0.01*					
Sum of diclofop-methyl, diclofop acid and its salts, expressed as diclofop-methyl (sum of isomers)	0.02*					
TEPP	0.01*					
Tebuconazole (R)	0.1		0.05		0.1	0.15
Tebufenozide (F)	0.01*				0.7	
Tebufenpyrad (F)	0.01*				0.2	
Tecnazene (F)	0.01*				0.05	
Teflubenzuron (F)	0.01*					
Tefluthrin (tefluthrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.01*					
Tembotrione (Sum of parent tembotrione (AE 0172747) and its metabolite M5 (4,6-dihydroxy tembotrione), expressed as tembotrione) (R)	0.02*					
Tepraloxydim (sum of tepraloxydim and its metabolites that can be hydrolysed either to the moiety 3-(tetrahydro-pyran-4-yl)-glutaric acid or to the moiety 3-hydroxy-(tetrahydro-pyran-4-yl)-glutaric acid, expressed as tepraloxydim)	0.1*					
Terbacil					0.1	
Terbufos	0.01*				0.005	
Terbutylazine (R) (F)	0.01*					
Tetraconazole (F)	0.02*					
Tetradifon	0.01*				-	
Thiabendazole (R)	5.0		5		3	10
Thiacloprid	0.01*				-	
Thiamethoxam	0.2		0.2		0.2	0.4
Thiencarbazone-methyl	0.01*					
Thifensulfuron-methyl	0.01*					
Thiobencarb (4-chlorobenzyl methyl sulfone) (A)	0.01*					
Thiodicarb	0.01*				3	
Thiophanate-methyl (R)	1.0				2	
Thiram (expressed as thiram)	0.1*					
Tolclofos-methyl (F)	0.01*				0.1	

Pesticide residue	EU¹	Vietnam²	CODEX³	ASEAN⁴	Japan⁵	USA⁶
Tolylfluanid (Sum of tolylfluanid and dimethylaminosulfotoluidide expressed as tolylfluanid) (R) (F)	0.02*					
Topramezone (BAS 670H)	0.01*					
Tralkoxydim (sum of the constituent isomers of tralkoxydim)	0.01*					
Tri-allate	0.1*				0.1	
Triadimefon (F)	0.01*			0.05	0.05	
Triaccontanol		+				
Triadimenol (any ratio of constituent isomers)	0.01*			0.05	0.05	
Triasulfuron	0.01*					
Triazophos (F)	0.01*					
Triazoxide	0.001*					
Tribenuron-methyl	0.01*					
Trichlorfon	0.01*				0.5	
Triclopyr	0.01*				0.03	
Tricyclazole	0.01*				-	
Tridemorph (F)	0.01*				0.05	
Trifloxystrobin (R) (F)	0.01*				0.7	0.7
Triflumezopyrim						
Triflumizole: Triflumizole and metabolite FM-6-1(N-(4-chloro-2-trifluoromethylphenyl)-n-propoxyacetamide), expressed as Triflumizole (R) (F)	0.02*				0.7	2.5
Triflumuron (F)	0.01*				0.02	
Trifluralin	0.01*				0.05	
Triflusulfuron (6-(2,2,2-trifluoroethoxy)-1,3,5-triazine-2,4-diamine (IN-M7222)) (A)	0.01*					
Triforine	0.01*	+				
Trimethyl-sulfonium cation, resulting from the use of glyphosate (F)	0.05*					
Trinexapac (sum of trinexapac (acid) and its salts, expressed as trinexapac)	0.01*					
Triticonazole	0.01*					
Tritosulfuron	0.01*					
Valifenalate	0.01*					
Vinclozolin	0.01*					
Warfarin	0.01*				0.001	
Ziram	0.1*					
Zoxamide	0.02*					

6. ASEAN MRLs for crops other than Mango

ASEAN MRLs are shown in Table 4.

Table 4. MARLS for different crop/pesticide combinations

Crops	Pesticide	MRL (mg/kg)
Mango	Carbendazim	5
	Cyhalothrin	0.2
	Cypermethrin	0.7
	Cypermethrin	0.7
	Deltamethrin	0.2
	Dichlorvos	0.1
	Dimethoate	1
	Dithiocarbamates	2
	Fenvalerate	1
	Imidacloprid	0.2
	Profenofos	0.2
	Propiconazole	0.05
	Pyriproxyfen	0.02
	Spinetoram	0.01
	Triadimefon	0.05
Triadimenol	0.05	
Apple	Carbaryl	3
	Deltamethrin	0.2
	Fenitrothion	0.5
	Methidathion	0.5
Asparagus	Carbaryl	15
	Carbendazim	0.2
	Carbofuran	0.06
	Carbosulafan	0.02
	Cyhalothrin	0.02
	Cypermethrin	0.3
	Deltamethrin	0.1
	Dimethoate	0.05
	Dithiocarbamates	0.1
	Malathion	1
	Metalaxyl	0.05
	Methomyl	2
Permethrin	1	
Assorted tropical and sub-tropical fruits-inedible peel	Paraquat	0.01

Crops	Pesticide	MRL (mg/kg)
Avocado	Metalaxyl	0.2
Banana	Bitertanol	0.5
	Carbendazim	0.2
	Carbofuran	0.01
	Chlorothalonil	15
	Chlorpyrifos	2
	Dithiocarbamates	2
	Fenamiphos	0.05
	Fipronil	0.005
	Imidacloprid	0.05
	Propiconazole	0.1
	Tebuconazole	1.5
	Triadimenol	1
Basil leave	Buprofezin	3
	Emamectin Benzoate	0.6
	Fipronil	0.6
	Lambda Cyhalothrin	
	Thiamethoxam	1
Bean, except broad bean & soya bean	Methomyl	1
Beans	Diazinon	0.2
Beans (dry)	Carbendazim	0.5
	Cycloxydim	30
	Iprodione	0.1
	Malathion	2
	Methomyl	0.05
	Permethrin	0.1
Beans (except broad bean & soya bean)	Imidacloprid	2
	Malathion	1
Beans, except broad bean and soya bean (green pods & immature seeds)	Cycloxydim	15
Brassica (Cole or Cabbage) Vegetables, Head Cabbage, Flowerhead Brassicas	Cycloxydim	9
Brassica vegetables	Cypermethrin	1
	Spinosad	2
Brinjal	Permethrin	1
Broad bean	Triazophos	0.02
Broccoli	Chlorpyrifos	2
	Diazinon	0.5
	Imidacloprid	0.5
	Iprodione	25

Crops	Pesticide	MRL (mg/kg)
	Metalaxyl	0.5
	Permethrin	2
	Tebufenozide	0.5
Broccoli, Chinese (Brassica oleracea Var. Alboglabra)	Fenvalerate	3
Broccoli, Chinese (VB 0401)	Fenvalerate	3
Brussels sprouts	Carbendazim	0.5
	Chlorothalonil	6
	Diflubenzuron	1
	Dimethoate	0.2
	Fenamiphos	0.05
	Imidacloprid	0.5
	Metalaxyl	0.2
	Permethrin	1
	Profenofos	0.5
	Teflubenzuron	0.5
	Triazophos	0.1
Cabbage	Beta-Cyfluthrin	0.04
	Chlorpyrifos	1
	Cypermethrin	1
	Diflubenzuron	1
	Dithiocarbamates	5
	Fenvalerate	3
	Methamidophos	1
	Monocrotophos	0.2
	Permethrin	5
	Propamocarb Hydrochloride	0.1
Cabbage head (VB 0041)	Acephate	2
	Chlorpyrifos	1
	Cyhalothrin	0.3
	Diazinon	0.5
	Fenamiphos	0.05
	Fenitrothion	0.5
	Fipronil	0.02
	Imidacloprid	0.5
	Metalaxyl	0.5
	Profenofos	1
	Tebufenozide	5
	Teflubenzuron	0.2
Cabbage, savoy	Dimethoate	2

Crops	Pesticide	MRL (mg/kg)
Cacao beans	Metalaxyl	0.2
Cantaloupe	Diazinon	0.2
	Azoxystrobin	0.1
Carambola	Cypermethrin	0.2
	Lufenuron	0.2
Carrot	Carbaryl	0.5
	Carbendazim	0.2
	Chlorpyrifos	0.1
	Cycloxydim	5
	Deltamethrin	0.02
	Diazinon	0.5
	Dithiocarbamates	1
	Iprodione	10
	Metalaxyl	0.05
x	Permethrin	0.1
Cauliflower	Chlorpyrifos	0.05
	Chlorpyrifos	0.05
	Chlorpyrifos	0.05
	Cyfluthrin	2
	Dimethoate	0.2
	Imidacloprid	0.5
	Metalaxyl	0.5
	Permethrin	0.5
	Profenofos	0.5
	Propamocarb Hydrochloride	2
Celery	Chlorothalonil	20
	Chlorpyrifos	0.05
	Cyromazine	4
	Dimethoate	0.5
	Permethrin	2
Cereal grains	Deltamethrin	2
	Dichlorvos	5
	Imidacloprid	0.05
	Metalaxyl	0.05
x	Permethrin	2 (Po)
	Carbendazim	2
Chili pepper	Chlorpyrifos	3
	Deltamethrin	0.1
	Methomyl	1
	Profenofos	3

Crops	Pesticide	MRL (mg/kg)
Chinese broccoli (Chinese kale)	Lambda Cyhalothrin	0.2
Chinese cabbage	Chlorpyrifos	1
	Diazinon	0.05
	Malathion	8
	Permethrin	5
Citrus	Lambda Cyhalothrin	0.2
	2,4-D	1
	Abamectin	0.02
	Bromopropylate	2
Citrus fruit	Buprofezin	1
	Carbaryl	15
	Chlorpyrifos	1
	Chlorpyrifos	1
	Cyfluthrin	0.3
	Cyhalothrin	0.2
	Cypermethrin	0.3
	Deltamethrin	0.02
	Diflubenzuron	0.5
	Dimethoate	5
	Fenthion	2
	Imidacloprid	1
	Malathion	7
	Metalaxyl	5 (Po)
	Methomyl	1
	Paraquat	0.02
	Permethrin	0.5
Coffee beans	Carbendazim	0.1
	Chlorpyrifos	0.05
	Cypermethrin	0.05
	Imidacloprid	1
	Permethrin	0.05
	Triadimefon	0.5
	Triadimenol	0.5
	Triazophos	0.05
Common bean (pods and/ or immature seeds)	Bromopropylate	3
	Carbendazim	0.5
	Iprodione	2
	Permethrin	1
Common beans	Chlorpyrifos	0.01

Crops	Pesticide	MRL (mg/kg)
	Methomyl	1
	Triazophos	0.2
Cotton seed	Abamectin	0.01
	Methomyl	0.2
	Permethrin	0.5
	Profenofos	3
	Triazophos	0.2
Cowpea	Diazinon	0.2
Crucifers	Cypermethrin	1
Crude palm kernel oil	Chlorantraniliprole	0.05
Crude palm oil	Chlorantraniliprole	1.5
Cucumber	Abamectin	0.03
	Amitraz	0.5
	Bitertanol	0.5
	Bromopropylate	0.5
	Carbendazim	0.05
	Chlorothalonil	3
	Cyromazine	2
	Diazinon	0.1
	Dithiocarbamates	0.5
	Folpet	1
	Imidacloprid	1
	Iprodione	2
	Malathion	0.2
	Metalaxyl	0.5
	Methamidophos	1
	Permethrin	0.5
x	Tebuconazole	0.2
Dragon fruit (pitaya)	Azoxystrobin	0.3
	Difenoconazole	0.15
	Propineb	3
	Tebuconazole	1
	Trifloxystrobin	0.6
Durian	Cypermethrin	1
x	Phosalone	1
Eggplant	Buprofezin	1
	Carbaryl	1
	Carbofuran	0.05
	Carbosulfan	0.06
	Chlorpyrifos	0.2

Crops	Pesticide	MRL (mg/kg)
	Cyfluthrin	0.2
	Cypermethrin	0.03
	Fenitrothion	0.1
	Fenpropathrin	0.2
	Imidacloprid	0.2
	Malathion	0.5
x	Permethrin	1
	Buprofezin	0.7
	Chlorothalonil	5
	Cyhalothrin	0.5
	Cypermethrin	0.07
Flowerhead brassicas (includes Broccoli: Broccoli, Chinese, and Cauliflower)	Deltamethrin	0.1
	Deltamethrin	0.2
	Fipronil	0.02
	Methomyl	0.1
	Paraquat	0.02
	Triadimefon	0.2
	Triadimenol	0.2
Fruiting vegetables, cucurbits	Buprofezin	0.7
	Cyhalothrin	0.05
	Cypermethrin	0.07
	Deltamethrin	0.2
	Methomyl	0.1
	Paraquat	0.02
	Propamocarb Hydrochloride	5
	Triadimefon	0.2
	Triadimenol	0.2
Fruiting vegetable other than cucurbits	Cyhalothrin	0.3
	Paraquat	0.05
fruiting vegetables other than cucurbits except fungi and sweet corns	Cyromazine	1
	Triadimenol	1
Garden pea, shelled	Carbendazim	0.02
	Diazinon	0.05
	Dithiocarbamates	0.5
Garlic stem	Cypermethrin	0.5
Gherkin	Metalaxyl	0.5
Grapes	Bromopropylate	2

Crops	Pesticide	MRL (mg/kg)
	Carbendazim	3
	Chlorothalonil	3
	Chlorpyrifos	0.5
	Cycloxydim	0.3
	Cypermethrin	0.2
	Deltamethrin	0.2
	Dithiocarbamates	5
	Ethephon	0.8
	Folpet	10
	Imidacloprid	1
	Iprodione	10
	Malathion	5
	Metalaxyl	1
	Methidathion	1
	Methomyl	0.3
	Permethrin	2
	Tebufenozide	2
	Triadimefon	0.3
	Triadimenol	0.3
Kale	Diazinon	0.05
	Dimethoate	0.5
	Permethrin	5
Leafy vegetables	Cypermethrin	0.7
	Deltamethrin	2
	Paraquat	0.07
x	Spinosad	10
	Cycloxydim	4
Leek	Cypermethrin	0.05
	Dithiocarbamates	0.5
	Imidacloprid	0.05
	Permethrin	0.5
Legume vegetables	Cyhalothrin	0.2
	Cypermethrin	0.7
Lettuce	Propamocarb Hydrochloride	10
Lettuce, head	Carbendazim	5
	Cycloxydim	1.5
	Cyromazine	4
	Diazinon	0.5
	Dimethoate	0.3
	Dithiocarbamates	5

Crops	Pesticide	MRL (mg/kg)
	Imidacloprid	2
	Iprodione	10
	Metalaxyl	2
	Methamidophos	1
	Methomyl	0.2
	Permethrin	2
	Tolclofos-Methyl	2
Lettuce, leaf	Cycloxydim	1.5
	Diazinon	0.5
	Iprodione	25
	Methomyl	0.2
	Tolclofos-Methyl	2
Lichi (lychee)	Chlorpyrifos	2
	Cypermethrin	2
	Spinetoram	0.06
Long beans	Diazinon	0.5
Longan	Carbaryl	20
	Chlorpyrifos	0.5
	Cypermethrin	1
	Imidacloprid	0.8
x	Lambda-Cyfluthrin	0.2
	2,4-D	0.05
	Carbaryl	0.02
Maize	Carbofuran	0.05
	Chlorpyrifos	0.05
	Cyhalothrin	0.02
	Diazinon	0.02
	Fipronil	0.01
	Malathion	0.05
	Metalaxyl	0.05
	Methomyl	0.02
	Paraquat	0.03
	Propiconazole	0.05
Maize, flour	Paraquat	0.05
Mandarins	Methidathion	3.5
	Dithiocarbamates	10
Mangosteen	Profenofos	10
melon	Azoxystrobin	1
	Difenoconazole	0.7
Melon, except watermelon	Abamectin	0.01

Crops	Pesticide	MRL (mg/kg)
	Bromopropylate	0.5
	Chlorothalonil	2
	Cyromazine	0.5
	Dithiocarbamates	0.5
	Dithiocarbamates	0.5
	Fenamiphos	0.05
	Folpet	3
	Imidacloprid	0.2
	Metalaxyl	0.2
x	Permethrin	0.1
	Cyromazine	7
Mushrooms	Deltamethrin	0.05
	Diflubenzuron	0.3
	Permethrin	0.1
Mustard	Diazinon	0.5
Mustard green	Malathion	2
Nectarine	Deltamethrin	0.05
Oilseed, except peanut	Cypermethrin	0.1
Okra	Cypermethrin	0.5
	Imidacloprid	0.1
	Lambda Cyhalothrin	0.03
	Methomyl	0.5
Onion bulbs	Chlorothalonil	1.5
	Chlorpyrifos	0.2
	Cypermethrin	0.01
	Deltamethrin	0.05
	Diazinon	0.05
	Dithiocarbamates	0.5
	Folpet	1
	Imidacloprid	0.1
	Iprodione	0.2
	Malathion	1
	Metalaxyl	2
	Methomyl	0.2
	Triazophos	0.05
Onion, spring	Triadimenol	0.05
	Triadimefon	0.05
Onion, welsh	Triadimenol	0.05
	Triadimefon	0.05
Oranges, sweet sour	Amitraz	0.5

Crops	Pesticide	MRL (mg/kg)
	Carbendazim	1
	Dithiocarbamates	2
	Thiamethoxam	0.5
Palm Oil	Acephate	0.01
	Methamidophos	0.01
	Monocrotophos	0.01
Papaya	Cypermethrin	0.5
	Cypermethrin	0.5
	Dithiocarbamates	5
x	Pyriproxyfen	0.15
Peach	Captan	20
	Chlorpyrifos	0.5
	Deltamethrin	0.05
	Diazinon	0.2
	Iprodione	10
Peanut	Carbendazim	0.1
	Chlorothalonil	0.1
	Dithiocarbamates	0.1
	Fenamiphos	0.05
	Imidacloprid	1
	Metalaxyl	0.1
	Permethrin	0.1
Pear	Dimethoate	1
Peas	Methomyl	5
	Triazophos	0.1
peas (dry)	Imidacloprid	2
Peas (pods and succulent immature seeds)	Chlorpyrifos	0.01
	Dimethoate	1
	Imidacloprid	5
	Methomyl	5
	Triadimefon	0.05
	Triadimenol	0.1
Peas, Shelled (succulent seed)	Cycloxydim	15
	Imidacloprid	2
	Metalaxyl	0.05
	Permethrin	0.1
Pepper (black & white)	Beta-Cyfluthrin	0.03
	Imidacloprid	0.02
	Tebuconazole	0.01
	Trifloxystrobin	0.01

Crops	Pesticide	MRL (mg/kg)
Pepper (VO 0051)	Fenpropathrin	1
Pepper chili, dried	Abamectin	0.5
	Carbaryl	2
	Carbaryl	2
	Chlorpyrifos	20
	Cyfluthrin	1
	Cypermethrin	10
	Dimethoate	3
	Fenpropathrin	10
	Imidacloprid	10
	Malathion	1
	Metalaxyl	10
	Methomyl	10
Pepper, sweet	Profenofos	0.5
Peppers	Chlorpyrifos	2
	Cyfluthrin	0.2
	Dimethoate	1
	Fenitrothion	0.1
	Imidacloprid	1
	Malathion	0.1
	Metalaxyl	1
	Methomyl	0.7
	Permethrin	1
	Tebuconazole	1
peppers chili	Carbaryl	0.5
	Cypermethrin	2
Peppers, sweet	Chlorothalonil	7
	Diazinon	0.05
	Dithiocarbamates	1
	Methamidophos	1
	Propamocarb Hydrochloride	3
x	Tebuconazole	1
Peppers, sweet (including pimento or pimienta)	Abamectin	0.09
	Carbaryl	5
	Chlorpyrifos	2
x	Dimethoate	0.5
Pineapple	Carbendazim	5
	Deltamethrin	0.01
	Diazinon	0.1

Crops	Pesticide	MRL (mg/kg)
	Ethephon	1.5
	Metalaxyl	0.1
	Triadimefon	5
	Triadimenol	5
Plums (incl. prunes)	Captan	10
x	Diflubenzuron	0.5
Pome fruits	Captan	15
	Chlorpyrifos	1
	Cyhalothrin	0.2
	Cypermethrin	0.7
	Diazinon	0.3
	Diflubenzuron	5
	Dithiocarbamates	5
	Iprodione	5
	Metalaxyl	1
pomegranate	Imidacloprid	1
Potato	2,4-D	0.2
	Abamectin	0.005
	Chlorpyrifos	2
	Cycloxydim	3
	Cyfluthrin	0.01
	Deltamethrin	0.01
	Diazinon	0.01
	Dithiocarbamates	0.2
	Fipronil	0.02
	Metalaxyl	0.05
	Methomyl	0.02
	Permethrin	0.05
	Profenofos	0.05
	Teflubenzuron	0.05
	Tolclofos-Methyl	0.2
	Triazophos	0.05
Prunes	Diazinon	2
Pulses	Chlorothalonil	1
	Cyhalothrin	0.05
	Cypermethrin	0.05
	Deltamethrin	1
	Paraquat	0.5
Pummelo	Ethion	1
	Malathion	0.2

Crops	Pesticide	MRL (mg/kg)
	Profenofos	2
Pumpkins	Dithiocarbamates	0.2
Radish	Diazinon	0.1
	Deltamethrin	0.01
	Tolclofos-Methyl	0.1
Raspberries, red, black	Metalaxyl	0.2
Rice	2,4-D	
	Carbendazim	
	Carbofuran	0.1
	Chlorpyrifos	0.5
	Fenthion	
	Fipronil	0.01
	Iprodione	
rice (Paddy)	Cyhalothrin	1
	Cypermethrin	2
	Paraquat	0.05
	Tebufenozide	0.1
Rice bran, unprocessed	Fenitrothion	40
Rice husked (brown rice)	Lufenuron	0.01
Root and tuber vegetables	Chlorothalonil	0.3
	Chlorothalonil	0.3
	Cyhalothrin	0.01
	Cyhalothrin	0.01
	Cypermethrin	0.01
	Imidacloprid	0.5
	Paraquat	0.05
Shaddocks or pomelos	Cypermethrin	0.5
Shallot bulb	Cypermethrin	0.1
x	Methomyl	0.2
Sorghum	2,4-D	0.01
	Chlorpyrifos	0.5
	Malathion	3
	Paraquat	0.03
Soya bean (dry)	2,4-D	0.01
	Carbaryl	0.2
	Carbendazim	0.5
	Chlorpyrifos	0.1
	Cycloxydim	80
	Diflubenzuron	0.1
	Metalaxyl	0.05

Crops	Pesticide	MRL (mg/kg)
	Methamidophos	0.1
	Methomyl	0.2
	Permethrin	0.05
	Profenofos	0.05
	Triazophos	0.05
Soya beans	Diazinon	0.2
	Acephate	0.3
Soybean immature	Chlorpyrifos	1
	Cyhalothrin	0.2
	Triazophos	0.5
	Triazophos	1
Soybean oil, refined	Chlorpyrifos	0.03
<i>Spinach</i>	Diazinon	0.5
	Malathion	3
	Metalaxyl	2
	Permethrin	2
Spring onion	Chlorothalonil	10
	Diazinon	1
	Malathion	5
	Permethrin	0.5
Squash, summer	Bromopropylate	0.5
	Carbendazim	0.5
	Chlorothalonil	3
	Diazinon	0.05
	Dithiocarbamates	1
	Imidacloprid	1
	Metalaxyl	0.2
	Permethrin	0.5
stinking	Buprofezin	10
Strawberry	Abamectin	0.15
	Bromopropylate	2
	Captan	15
	Chlorpyrifos	0.3
	Cycloxydim	3
	Cypermethrin	0.07
	Deltamethrin	0.2
	Diazinon	0.1
	Dithiocarbamates	5
	Folpet	5
	Imidacloprid	0.5

Crops	Pesticide	MRL (mg/kg)
	Iprodione	10
	Malathion	1
	Permethrin	1
	Triadimefon	0.7
	Triadimenol	0.7
	Triazophos	0.05
Stringbeans	Malathion	1
Sugar beet	Metalaxyl	0.05
Sugar cane	2,4-D	0.05
	Cyhalothrin	0.05
	Cypermethrin	0.2
	Propiconazole	0.02
Sunflower seed	Carbaryl	0.2
	Deltamethrin	0.05
	Fipronil	0.002
	Imidacloprid	0.05
	Iprodione	0.5
	Metalaxyl	0.05
	Paraquat	2
	Permethrin	1
Sweet corn	Carbaryl	0.1
x	Cypermethrin	0.05
Sweet corn (corn-on-the-cob)	2,4-D	0.05
	Chlorpyrifos	0.01
	Deltamethrin	0.02
	Diazinon	0.02
	Dithiocarbamates	0.1
	Imidacloprid	0.02
	Malathion	0.02
	Permethrin	0.1
	Propiconazole	0.05
Sweet potato	Carbaryl	0.02
Tea	Deltamethrin	5
Tea (green, black)	Chlorpyrifos	2
	Methidathion	0.5
	Paraquat	0.2
x	Permethrin	20
Tomato	Abamectin	0.05
	Acephate	1
	Amitraz	0.5

Crops	Pesticide	MRL (mg/kg)
	Bitertanol	3
	Buprofezin	1
	Captan	5
	Carbaryl	5
	Carbendazim	0.5
	Chlorothalonil	5
	Chlorpyrifos	0.5
	Chlorpyrifos	0.5
	Cyfluthrin	0.2
	Cypermethrin	0.2
	Deltamethrin	0.3
	Diazinon	0.5
	Dithiocarbamates	2
	Fenpropathrin	1
	Folpet	3
	Imidacloprid	0.5
	Iprodione	5
	Malathion	0.5
	Metalaxyl	0.5
	Methamidophos	1
	Monocrotophos	1
	Permethrin	1
	Profenofos	10
	Propamocarb Hydrochloride	2
	Tebuconazole	0.7
	Triadimenol	1
Tomato juice	Malathion	0.01
Tree nuts	2,4-D	0.2
	Carbaryl	1
	Carbendazim	0.1
	Cyhalothrin	0.01
	Imidacloprid	0.01
x	Paraquat	0.05
Turnip greens	Dimethoate	1
	Malathion	5
Turnip, garden	Dimethoate	0.1
Turnip, garden	Carbaryl	1
x	Malathion	0.2
Watermelon	Dithiocarbamates	1
	Imidacloprid	0.2

Crops	Pesticide	MRL (mg/kg)
	Metalaxyl	0.2
Wheat	Malathion	10
Wheat bran (unprocessed)	Dichlorvos	15
	Fenitrothion	25
	Permethrin	5
Wheat flour	Dichlorvos	0.7
	Malathion	0.2
	Permethrin	0.5
Wheat whole meal	Dichlorvos	3
	Permethrin	2
Winter squash	Metalaxyl	0.2
Yard Long Bean	Cypermethrin	0.2
	Dimethoate	0.05
	Fipronil	0.04
	Omethoate	0.05
	Triazophos	0.4

7. LOD values for pesticide analysis applying the QuEChERS method

In analytical chemistry, the detection limit, the lower limit of detection, or LOD (limit of detection), often mistakenly confused with the analytical sensitivity, is the lowest quantity of a substance that can be distinguished from the absence of that substance (a blank value) with a stated confidence level (generally 99%).

The detection limit is estimated from the mean of the blank, the standard deviation of the blank, the slope (analytical sensitivity) of the calibration plot and a defined confidence factor (e.g., 3.2 is the most accepted value for this arbitrary value). (Source Wikipedia).

The LOD values for common pesticides approved by various authorities for use on mango, or typically applied to mango are shown in the following table.

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
1,3-Dichloropropene	0.05*	-					
1-methylcyclopropene	0.01*	-					
1-Naphthylacetamide	0.05*	+					
1-Naphthylacetic acid	0.05*	-					
2,4,5-T (F)	0.05*	-					
2,4-D (sum of 2,4-D and its esters expressed as 2,4-D)	0.05*	+					0.004
2,4-DB (sum of 2,4-DB, its salts, its esters and its conjugates, expressed as 2,4-DB) (R)	0.05*	-					
2-phenylphenol	0.05*	+		0.005			
Abamectin (sum of avermectin B1a, avermectinB1b and delta-8,9 isomer of avermectin B1a) (F)	0.01*	+	0,0012/0,0012				
Acephate	0.02*	+	0.004				
Acequinocyl	0.01*	+					
Acetochlor	0.01*	+		0.005			
Acibenzolar-S-methyl (sum of acybenzolar-S-methyl and acibenzolar acid (CGA 210007) expressed as acybenzolar-S- methyl)	0.02*	-					
Aclonifen	0.05*	+	0.004				
Aldicarb (sum of aldicarb, its sulfoxide and its sulfone, expressed as aldicarb)	0.02*	+	0,0012/0,0012/0,0012				
Aldrin and Dieldrin (Aldrin and dieldrin combined expressed as	0.01*	+			0,001/0,001		

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
dieldrin) (F)							
Ametoctradin	0.01*	+	0.004				
Amidosulfuron (R)	0.01*	+				0.004	
Aminopyralid	0.01*	+	0.004				
Amisulbrom	0.01*	+					
Amitraz (amitraz including the metabolites containing the 2,4 - dimethylaniline moiety expressed as amitraz)	0.05*	+	0,002/0,002/0,002				
Anilazine	0.05*	-					
Aramite (F)	0.01*	-					
Atrazine (F)	0.05*	+	0.004				
Aureobasidium pullulans strains DSM 14940 and DSM 14941 (++)	0.01*	-					
Azimsulfuron	0.02*	+				0.004	
Azinphos-ethyl (F)	0.02*	+	0.004				
Azinphos-methyl (F)	0.05*	+	0.004				
Barban (F)	0.05*	+					
Beflubutamid	0.05*	+					
Benalaxyl including other mixtures of constituent isomers including benalaxyl-M (sum of isomers)	0.05*	+	0.004				
Benfluralin (F)	0.05*	+					
Benfuracarb	0.05*	?					
Benthiavalicarb (Benthiavalicarb-isopropyl (KIF-230 R-L) and its enantiomer (KIF-230 S-D) and	0.01*	+	0.004				

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
diastereomers (KIF-230 R-L and KIF-230 S-D)							
Bifenox (F)	0.05*	+	0.004				
Binapacryl (F)	0.05*	+					
Biphenyl	0.01*	+		0.005			
Bitertanol (F)	0.05*	+	0.004				
Bixafen	0.01*	+	0.004				
Bromophos-ethyl	0.05*	+	0.004				
Bromopropylate (F)	0.01*	+		0.005			
Bromoxynil (bromoxynil including its esters expressed as bromoxynil) (F)	0.05*	+	0.008				
Bromuconazole (sum of diastereoisomers) (F)	0.05*	+	0.004				
Bupirimate	0.05*	+		0.005			
Butralin	0.02*	+					
Butylate	0.05*	+	0.004				
Cadusafos	0.01*	+	0.004				
Camphechlor (Toxaphene) (F) (R)	0.1*	-					
Captafol (F)	0.02*	+			0.003		
Carbaryl (F)	0.05*	+	0.004				
Carbofuran (sum of carbofuran and 3-hydroxy-carbofuran expressed as carbofuran)	0.02*	+	0,0004/0,0004				
Carbosulfan	0.05*	?					
Carfentrazone-ethyl (determined as carfentrazone and expressed as	0.01*	+	0,002/0,002				

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carfentrazone-ethyl)							
Chlorbenside (F)	0.01*	+					
Chlorbufam	0.05*	+					
Chlordane (sum of cis- and trans- chlordane) (F) (R)	0.01*	+			0,001/0,001		
Chlorfenapyr	0.05*	+			0.008		
Chlorfenson (F)	0.01*	+					
Chlorfenvinphos (F)	0.02*	+	0.004				
Chlormequat	0.05*	-					
Chlorobenzilate (F)	0.02*	+		0.005			
Chloropicrin	0.01*	-					
Chlorotoluron	0.05*	+	0.004				
Chloroxuron (F)	0.05*	+					
Chlorpropham (chlorpropham and 3-chloroaniline, expressed as chlorpropham) (F) (R)	0.05*	+		0.005			
Chlorpyrifos (F)	0.05*	+	0.002				
Chlorpyrifos-methyl (F)	0.05*	+	0.002				
Chlorsulfuron	0.05*	+				0.004	
Chlorthiamid	0.05*	+					
Chlozolinate	0.05*	+		0.005			
Chromafenozide	0.01*	+					
Cinidon-ethyl (sum of cinidon ethyl and its E-isomer)	0.05*	+	0.004				
Clodinafop and its S-isomers expressed as clodinafop (F)	0.02*	-					
Clofentezine (R)	0.02*	+	0.004				

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Clomazone	0.01*	+	0.004				
Cyanamide including salts expressed as cyanamide	0.05*	-					
Cyazofamid	0.01*	+	0.004				
Cyclanilide (F)	0.05*	+					
Cyflufenamid: sum of cyflufenamid (Z-isomer) and its E-isomer	0.02*	+	0.004				
Cyhalofop-butyl (sum of cyhalofop butyl and its free acids)	0.02*	-					
Cymoxanil	0.05*	+	0.004				
Cyproconazole (F)	0.05*	+	0.004				
Dalapon	0.05*	+					
Daminozide (sum of daminozide and 1,1-dimethyl-hydrazine, expressed as daminazide)	0.02*	-					
Dazomet (Methylisothiocyanate resulting from the use of dazomet and metam)	0.02*	+					
DDT (sum of p,p'-DDT, o,p'-DDT, p- p'-DDE and p,p'-TDE (DDD) expressed as DDT) (F)	0.05*	+			0,001/0,001/0,001/0,001		
Desmedipham	0.05*	+	0.004				
Diallate	0.05*	-					
Diazinon (F)	0.01*	+	0.004				
Dicamba	0.05*	+					0.004
Dichlobenil	0.05*	+					
Dichlorprop: sum of dichlorprop (including dichlorprop-P) and its	0.05*	+					0.004

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conjugates, expressed as dichlorprop							
Dichlorvos	0.01*	+		0.005			
Diclofop (sum diclofop-methyl and diclofop acid expressed as diclofop-methyl)	0.05*	-					
Dicofol (sum of p, p' and o,p' isomers) (F)	0.02*	+		0.005			
Diiflubenzuron (F) (R)	0.05*	+	0.004				
Diiflufenican	0.05*	+	0.004				
Dimethachlor	0.02*	+	0.004				
Dimethenamid-p (dimethenamid-p including other mixtures of constituent isomers (sum of isomers))	0.01*	+	0.004				
Dimethipin	0.1*	+			0.003		
Dimethoate (sum of dimethoate and omethoate expressed as dimethoate)	0.02*	+	0.002				
Dimethomorph (sum of isomers)	0.05*	+	0.004				
Dimoxystrobin	0.01*	+	0.004				
Diniconazole	0.05*	+	0.004				
Dinocap (sum of dinocap isomers and their corresponding phenols expressed as dinocap) (F)	0.05*	+	0.004				
Dinoseb	0.05*	-					
Dinoterb	0.05*	-					
Dioxathion	0.05*	+					

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Diphenylamine	0.05*	+		0.005			
Diquat	0.05*	-					
Disulfoton (sum of disulfoton, disulfoton sulfoxide and disulfoton sulfone expressed as disulfoton) (F)	0.02*	+	0,001/0,001/0,001				
Dithianon	0.01*	+					0.003
DNOC	0.05*	-					
Dodine	0.2*	+	0.004				
Emamectin benzoate B1a, expressed as emamectin	0.01*	+	0.004				
Endosulfan (sum of alpha- and beta-isomers and endosulfan- sulphate expresses as endosulfan) (F)	0.05*	+			0,001/0,001		
Endrin (F)	0.01*	+			0.001		
Epoxiconazole (F)	0.05*	+	0.004				
EPTC (ethyl dipropylthiocarbamate)	0.01*	+					
Ethametsulfuron-methyl	0.01*	+					
Ethephon	0.05*	-					
Ethion	0.01*	+	0.004				
Ethirimol	0.05*	+	0.004				
Ethofumesate (sum of ethofumesate and the metabolite 2,3-dihydro-3,3-dimethyl-2-oxo- benzofuran-5-yl methane sulphonate expressed as	0.05*	+	0.002				

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ethofumesate)							
Ethoprophos	0.02*	+	0.004				
Ethoxyquin (F)	0.05*	+					
Ethoxysulfuron	0.05*	+					
Ethylene oxide (sum of ethylene oxide and 2-chloro-ethanol expressed as ethylene oxide) (F)	0.1*	-					
Etoxazole	0.02*	+	0.004				
Etridiazole	0.05*	+					
Famoxadone	0.02*	+	0.004				
Fenamidone	0.02*	+	0.004				
Fenamiphos (sum of fenamiphos and its sulphoxide and sulphone expressed as fenamiphos)	0.02*	+	0,0004/0,0004/0,0004				
Fenarimol	0.02*	+	0.004				
Fenbuconazole	0.05*	+	0.004				
Fenbutatin oxide (F)	0.05*	+	0.004				
Fenchlorphos (sum of fenchlorphos and fenchlorphos oxon expressed as fenchlorphos)	0.01*	-					
Fenitrothion	0.01*	+	0.004				
Fenoxycarb	0.05*	+	0.004				
Fenpropathrin	0.01*	+	0.004				
Fenpropidin (sum of fenpropidin and its salts, expressed as fenpropidin) (R)	0.05*	+	0.004				

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Fenpropimorph (R)	0.05*	+	0.004				
Fenpyrazamine	0.01*	+	0.004				
Fenthion (fenthion and its oxigen analogue, their sulfoxides and sulfone expressed as parent) (F)	0.01*	+	0,0004/0,001/0,0004/0,0004				
Fentin acetate (F) (R)	0.05*	-					
Fentin hydroxide (F) (R)	0.05*	-					
Fenvalerate and Esfenvalerate (Sum of RR & SS isomers) (F)	0.02*	+		0.005			
Fenvalerate and Esfenvalerate (Sum of RS & SR isomers) (F)	0.02*	+		0.005			
Fipronil (sum fipronil + sulfone metabolite (MB46136) expressed as fipronil) (F)	0.005*	+	0,0008/0,0008				
Flazasulfuron	0.01*	+				0.004	
Flonicamid (sum of flonicamid, TNFG and TNFA) (R)	0.05*	+	0,002/				
Florasulam	0.01*	+				0.004	
Fluazinam (F)	0.05*	+	0.004				
Flucycloxuron	0.05*	+					
Flucythrinate (F) (R)	0.05*	+					
Flufenacet (sum of all compounds containing the N fluorophenyl-N-isopropyl moiety expressed as flufenacet equivalent)	0.05*	+	0.004				
Flufenzin	0.05*	-					
Flumioxazine	0.05*	+	0.004				

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Fluometuron	0.01*	+	0.004				
Fluopicolide	0.01*	+	0.004				
Fluoride ion	2*	-					
Fluoroglycofene	0.01*	-					
Fluoxastrobin	0.05*	+	0.002				
Flupyrulfuron-methyl	0.02*	+				0.004	
Fluquinconazole (F)	0.05*	+	0.004				
Flurochloridone	0.1*	+		0.005			
Fluroxypyr (fluroxypyr including its esters expressed as fluroxypyr) (R)	0.05*	+					0.004
Flurprimidole	0.01*	+					
Flurtamone	0.02*	+					
Flusilazole (F) (R)	0.02*	+	0.004				
Flutolanil	0.05*	+	0.004				
Flutriafol	0.05*	+	0.004				
Fomesafen	0.01*	+	0.004				
Foramsulfuron	0.01*	+				0.004	
Forchlorfenuron	0.05*	+					
Formothion	0.02*	+		0.005			
Fosetyl-Al (sum fosetyl + phosphorous acid and their salts, expressed as fosetyl)	2*	-					
Fosthiazate	0.02*	+	0.004				
Fuberidazole	0.05*	+	0.004				
Furathiocarb	0.05*	?					
Glyphosate	0.1*	-					

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Guazatine	0.1*	-					
Halosulfuron methyl	0.01*	+					
Heptachlor (sum of heptachlor and heptachlor epoxide expressed as heptachlor) (F)	0.01*	+			0,001/0,001/0,001		
Hexachlorobenzene (F)	0.01*	+			0.001		
Hexachlorocyclohexane (HCH), sum of isomers, except the gamma isomer	0.01*	+			0.001		
Hexaconazole	0.02*	+	0.004				
Hymexazol	0.05*	-					
Imazalil	0.05*	+	0.004				
Imazamox	0.05*	+	0.004				
Imazapic	0.01*	-					
Imazaquin	0.05*	+					0.003
Imazosulfuron	0.01*	+					
Iodosulfuron-methyl (iodosulfuron-methyl including salts, expressed as iodosulfuron-methyl)	0.02*	+				0.004	
Ioxynil (sum of Ioxynil, its salts, and its esters, expressed as Ioxynil (F))	0.05*	+					
Ipconazole	0.01*	+	0.004				
Iprovalicarb	0.05*	+	0.004				
Isoprothiolane	0.01*	+	0.004				
Isoproturon	0.05*	+	0.004				

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Isopyrazam	0.01*	+	0.004				
Isoxaben	0.02*	+					
Isoxaflutole (sum of isoxaflutole and RPA 202248, expressed as isoxaflutole)	0.05*	+	0,004/				
Kresoxim-methyl (F) (R)	0.05*	+	0.004				
Lactofen	0.01*	+					
Lenacil	0.1*	+	0.004				
Lindane (Gamma-isomer of hexachlorocyclohexane (HCH)) (F)	0.01*	+			0.001		
Linuron	0.05*	+	0.004				
Lufenuron(F)	0.02*	+	0.004				
Malathion (sum of malathion and malaoxon expressed as malathion)	0.02*	+	0,002/0,002				
Maleic hydrazide (R)	0.2*	-					
Mandipropamid	0.01*	+	0.004				
MCPA and MCPB (MCPA, MCPB including their salts, esters and conjugates expressed as MCPA) (F) (R)	0.05*	+					0,004/0,004
Mecarbam	0.05*	+	0.004				
Mecoprop (sum of mecoprop-p and mecoprop expressed as mecoprop)	0.05*	+					0.004
Mepanipyrim (Mepanipyrim and its metabolite (2-anilino-4(2-hydroxypropyl)-6-methylpyrimidine), expressed as mepanipyrim)	0.01*	+	0.004				

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Mepiquat	0.05*	-					
Mepronil	0.05*	+	0.004				
Meptyldinocap (sum of 2,4 DNOPC and 2,4 DNOP expressed as meptyldinocap)	0.05*	-					
Mercury compounds (sum of mercury compounds expressed as mercury) (F)	0.01*	-					
Mesosulfuron-methyl expressed as mesosulfuron	0.01*	+					
Mesotrione (Sum of mesotrione and MNBA (4-methylsulfonyl-2-nitro benzoic acid), expressed as mesotrione)	0.05*	+	0.004				
Metaflumizone (sum of E- and Z-isomers)	0.05*	+	0.004				
Metalaxyl and metalaxyl-M (metalaxyl including other mixtures of constituent isomers including metalaxyl-M (sum of isomers))	0.05*	+	0.004				
Metaldehyde	0.05*	+	0.004				
Metamitron	0.1*	+	0.004				
Metconazole (F)	0.02*	+	0.004				
Methabenzthiazuron	0.01*	+					
Methacrifos (F)	0.05*	+	0.004				
Methamidophos	0.01*	+	0.004				
Methidathion	0.02*	+	0.004				

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Metholachlor and metholachlor-S (metholachlor including other mixtures of constituent isomers including S-metholachlor (sum of isomers))	0.05*	+	0.002				
Methomyl and Thiodicarb (sum of methomyl and thiodicarb expressed as methomyl)	0.02*	+	0,004/0,004				
Methoprene	0.05*	+					
Methoxychlor (F)	0.01*	+			0.001		
Metosulam	0.01*	+					
Metrafenone	0.05*	+	0.004				
Metribuzin	0.1*	+	0.004				
Metsulfuron-methyl	0.05*	+				0.004	
Mevinphos (sum of E- and Z-isomers)	0.01*	+	0.004				
Milbemectin (sum of MA4+8,9Z-MA4, expressed as milbemectin) (R)	0.05*	-					
Molinate	0.05*	+	0.004				
Monolinuron	0.05*	+	0.004				
Napropamide	0.05*	+	0.004				
Nicosulfuron	0.05*	+				0.004	
Nitrofen (F)	0.01*	+		0.01			
Orthosulfamuron	0.01*	+					
Oryzalin	0.01*	+					
Oxadiargyl	0.01*	+					
Oxadiazon	0.05*	+	0.004				
Oxadixyl	0.01*	+	0.004				

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Oxamyl	0.01*	+	0.004				
Oxasulfuron	0.05*	+				0.004	
Oxydemeton-methyl (sum of oxydemeton-methyl and demeton-S-methylsulfone expressed as oxydemeton-methyl)	0.01*	+	0,002/0,002				
Oxyfluorfen	0.05*	+	0.004				
Paclobutrazol	0.02*	+	0.004				
Paraquat	0.02*	-					
Parathion (F)	0.05*	+		0.005			
Parathion-methyl (sum of Parathion-methyl and paraoxon-methyl expressed as Parathion-methyl)	0.02*	+	0,003/0,003	0.005			
Penconazole (F)	0.05*	+	0.004				
Pencycuron (F)	0.05*	+	0.004				
Penoxsulam	0.01*	+				0.004	
Permethrin (sum of isomers)	0.05*	+		0.005			
Pethoxamid	0.01*	+	0.004				
Phenmedipham (R)	0.05*	+	0.004				
Phenothrin	0.05*	+					
Phorate (sum of phorate, its oxygen analogue and their sulfones expressed as phorate)	0.05*	+	0,001/0,001/0,0004/0,0004/0,0004/0,001				
Phosalone	0.05*	+	0.004				
Phosmet (phosmet and phosmet oxon expressed as phosmet) (R)	0.05*	+	0,004/0,004				
Phosphamidon	0.01*	+	0.004				

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Phoxim (F)	0.01*	+	0.004				
Picloram	0.01*	+					
Picolinafen	0.05*	+	0.004				
Picoxystrobin (F)	0.05*	+	0.004				
Pinoxaden	0.02*	+					
Pirimiphos-methyl (F)	0.05*	+	0.002				
Prochloraz (sum of prochloraz and its metabolites containing the 2,4,6-Trichlorophenol moiety expressed as prochloraz)	0.05*	+	0,004/0,004				
Profenofos (F)	0.05*	+	0.004				
Profoxydim	0.05*	+					
Prohexadione (prohexadione (acid) and its salts expressed as prohexadione-calcium)	0.05*	-					
Propamocarb (Sum of propamocarb and its salt expressed as propamocarb)	0.1*	+	0.004				
Propanil	0.1*	+					
Propaquizafop	0.05*	+	0.004				
Propargite (F)	0.01*	+	0.004				
Propham	0.05*	+	0.004				
Propiconazole	0.05*	+	0.004				
Propineb (expressed as propilendiamine)	0.05*	-					
Propoxur	0.05*	+	0.004				
Propoxycarbazone	0.02*	-					

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
(propoxycarbazone, its salts and 2-hydroxy-propoxy-propoxycarbazone, calculated as propoxycarbazone)							
Propyzamide (F) (R)	0.02*	+	0.004				
Proquinazid	0.02*	+	0.004				
Prosulfocarb	0.05*	+	0.004				
Prosulfuron	0.02*	+	0.004				
Prothioconazole (Prothioconazole-desthio) (R)	0.02*	+	0,004/0,004				
Pyraclostrobin (F)	0.02*	+	0.004				
Pyraflufen-ethyl	0.02*	+					
Pyrasulfotole	0.01*	-					
Pyrazophos (F)	0.05*	+	0.004				
Pyridalyl	0.01*	+	0.004				
Pyridate (sum of pyridate, its hydrolysis product CL 9673 (6-chloro-4-hydroxy-3-phenylpyridazin) and hydrolysable conjugates of CL 9673 expressed as pyridate)	0.05*	-					
Pyriproxyfen (F)	0.05*	+	0.004				
Pyroxsulam	0.01*	+					
Quinalphos	0.05*	+	0.004				
Quinclorac	0.05*	+	0.004				
Quinmerac	0.1*	+	0.004				
Quinoxyfen (F)	0.02*	+	0.004				

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
Quintozene (sum of quintozene and pentachloro-aniline expressed as quintozene) (F)	0.02*	+		0,005/0,005			
Resmethrin (resmethrin including other mixtures of constituent isomers (sum of isomers)) (F)	0.1*	+		0.01			
Rimsulfuron	0.05*	+				0.004	
Rotenone	0.01*	+	0.004				
Silthiofam	0.05*	+	0.004				
Simazine	0.01*	+	0.004				
Spirodiclofen (F)	0.02*	+	0.004				
Spiroxamine (R)	0.05*	+	0.004				
Sulcotrione	0.05*	+					
Sulfosulfuron	0.05*	+				0.004	
Sulfuryl fluoride	0.01*	-					
Tebufenozide (F)	0.05*	+	0.004				
Tecnazene (F)	0.05*	+		0.005			
Teflubenzuron	0.05*	+	0.004				
Tembotrione (R)	0.02*	+	0.004				
TEPP	0.01*	-					
Tepraloxymid	0.1*	+					
Terbufos	0.01*	+	0.0012				
Tetraconazole (F)	0.02*	+	0.004				
Tetradifon	0.01*	+		0.005			
Thiabendazole (R)	0.05*	+	0.004				
Thifensulfuron-methyl	0.05*	+				0.004	

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
Thiobencarb	0.1*	+					
Thiophanate-methyl (R)	0.1*	+	0.004				
Thiram (expressed as thiram)	0.1*	?					
Topramezone (BAS 670H)	0.01*	+	0.004				
Tralkoxydim	0.02*	+					
Triadimefon and triadimenol (sum of triadimefon and triadimenol) (F)	0.1*	+	0,004/0,004				
Tri-allate	0.1*	+	0.004				
Triasulfuron	0.05*	+				0.004	
Triazophos (F)	0.01*	+	0.004				
Tribenuron-methyl	0.01*	+				0.004	
Triclopyr	0.1*	+	0.01				
Tricyclazole	0.05*	+	0.004				
Tridemorph (F)	0.05*	+					
Triflumizole: Triflumizole and metabolite FM-6-1(N-(4-chloro-2- trifluoromethylphenyl)-n- propoxyacetamide), expressed as Triflumizole (F)	0.1*	+	0,004/n.i.				
Triflumuron (F)	0.05*	+	0.004				
Triflusulfuron	0.02*	+				0.004	
Triforine	0.01*	+	0.004				
Trimethyl-sulfonium cation, resulting from the use of glyphosate (F)	0.05*	-					
Triticonazole	0.01*	+	0.004				
Tritosulfuron	0.01*	+				0.004	

Active substance	MRL, (mg/kg)	QuEChERS (Datapool)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)	QuEChERS GC-ECD LOD (mg/kg)	QuEChERS LC-MS/MS LOD (mg/kg)	QuEChERS GC-MS LOD (mg/kg)
Valifenalate	0.01*	+	0.004				
Vinclozolin (sum of vinclozolin and all metabolites containing the 3,5-dichloranilinemoiety, expressed as vinclozolin) (R)	0.05*	+		0.005			
Ziram	0.1*	?					
Zoxamide	0.02*	+	0.004				

This defines the limits of detection for two different analytical methods (GC-MS/MS and LC-MS/MS detection) using the QuEChERS method of extraction. QuEChERS is a solid-phase extraction method widely used in the detection of pesticide residues in food. The name is a portmanteau word formed from "quick, easy, cheap, effective, rugged, and safe."

8. Sources of additional data

This section provides links to various sources of pesticide information from national MRL databases¹. Most of them are updated regularly. However, readers should also refer to current national regulations to ensure the accuracy of the information.

Country/market	Source	Notes
Argentina	SENASA Regulations InfoLEG Legislative documents	Select 'Resolucion' in 'Tipo de norma' and SENASA in "Dependencia.' Select 'Busqueda: Por Texto', and 'Resolucion' in 'Tipo de norma' and use 'LMR' in Text: search box.
Australia	FSANZ Food Standards Code Schedule 20	NZ MRLs also apply for NZ-produced food (TTMRA). MRLs are in Schedule 20.
Brazil	ANVISA Pesticide Monographs	MRLs included in the ANVISA pesticide "Monografias Autorizadas."
Canada	PMRA MRL Database PMRA Consultations	MRL Database (searchable). Proposed MRLs are the 'PMRL' series.
Chile	Chile Legislation	MRLs are in Resolution 581 (1999) – as updated by the Chilean Ministry of Health.
Codex	http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/pesticides/en/	MRL database (searchable).
Costa Rica	SFE MRL Webpage	MRLs are in RTCR 424-2008, as updated by SFE.
European Union	EU Pesticides Database EU MRL Legislation UK HSE Pesticides web page	EU database of pesticide MRLs and active substance authorizations (searchable). Regulation EC 396/2005 and amendments. Recently adopted and proposed EU MRLs (See 'News').
GCC	GSO Standards Store	A list of GCC Standards (available for purchase). Search for "maximum limits."
Hong Kong	CFS MRL Database	MRL Database (searchable).
India	FSSAI Legislation	MRLs are listed in the "Food Safety and Standards (Contaminants, Toxins, and Residues) Regulation, 2011. (See Compendium for updates).
Indonesia	Indonesia E-Legislation website	Select 'Nomor' as a search key and

		search for the “KR.040” set of regulations. MRLs currently in 55/Permentan/KR.040/11/2016.
Israel	MARD (PPIS) Data Bank	Select “Search” to access the Pesticide Residues database (searchable).
Japan	FFCR website	See “MRLs List” for a database of MRLs (searchable).
Korea	MFDS MRL database	MRL database (searchable). Also includes relevant Codex MRLs, and Import MRL information.
Malaysia	MOH FSQ Legislation	Select “Perundangan”. MRLs are in the Food Regulations 1985, see the linked Schedules (Schedule 16).
New Caledonia	DAVAR Pesticides webpage	MRLs are listed in “La deliberation no. 113/CP du 18 Octobre 1996”.
New Zealand	MRLs for agricultural compounds	MRLs are listed in “Food Notice: Maximum Residue Levels for Agricultural Compounds”.
Philippines	BAFS website no access	Use the PNS filter to select: 'Crops' > 'Fresh Fruits and Vegetables' > 'MRLs for various Fruits and Vegetables.'
Russian Federation	Rospotrebnadzor legal texts Requirements for pesticides (EU webpage)	Search for document series ‘1.2.3111-13’
Singapore	AVA Legislation webpage no access	See Sale of Food Act and the 9th Schedule in the associated Food Regulations.
South Africa	GOV.ZA portal	Search for ‘Foodstuffs pesticide.’
Switzerland	Federal Council portal	DFI MRL Ordinance (817 series).
Taiwan	FDA Laws & Regulations	See Standards for Pesticide Residue Limits in Foods.
Thailand	ACFS General Standards no access	Browse for the ‘9002’ document series.
USA	GPO Federal Digital System	MRLs are in e-CFR, Part 40, Section 180
Vietnam	Vietnam Law website Vietnam Law website – English version	Search Title for ‘TT-BYT maximum residue’. An MoH Circular is available for purchase in English through this webpage.

Other links of relevance:

Link	Notes
ASEAN Standards and Guidelines	Includes a database of ASEAN MRLs
Australia NRS MRL Database	A searchable database of MRLs for Australia and some other countries for Australian-registered pesticides on selected foods, compiled by the National Residue Survey.
Global MRL database (Bryant Christie)	Searchable MRL database for a wide range of commodities, pesticides, and countries. Free access to US MRLs, and other country MRLs is available by subscription.
USDA FAS Reports	USDA's Food and Agricultural Import Regulations and Standards (FAIRS) country reports and Exporters Guides.
WTO/SPS notifications (ePing)	A searchable database of WTO SPS and TBT notifications.



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