



BBPA Technical Circular No. 478

July 2018

Use of Pesticides on Hops for brewing

Use of Pesticides on Hops for brewing

1. Aims

This document is intended to be used by BBPA members who manufacture or commission the manufacture of beer. The aims are;

- to assist them in assessing the quality of hops which they purchase and use
- to assist in complying with EU and UK law relating to pesticides
- to maintain the quality and safety of their beer
- to ensure that pesticides used on hops do not adversely affect either beer quality, safety or flavour, of the efficiency of the brewing process

2. Structure

The pesticide information in this document is provided in three sections covering three annexes:

- Section 4: Hops grown in the UK (Annex 1)
- Section 5: Hops grown in the EU outside the UK (Annex 2)
- Section 6: Hops imported into the UK from outside the EU (Annex 3)

3. Annexes

Lists of pesticides which may be used on hops grown in the different jurisdictions and their appropriate maximum limits for residues are given in the Annexes. Where additional information is required for some values shown, this is given in comments, denoted by a red marker in the corner of the cell. Additions and deletions to Annexes 1 and 2 since the last publication (March 2017) are summarised at the end of this document. Changes to Annex 3 have not been listed separately; details should be checked individually for pesticides of interest. Changes to Annexes 1 and 2 are since the last publication are highlighted in yellow within the Annexes.

4: Hops grown in the UK

Chemicals used as pesticides (active ingredients) are authorised at EU level for all EU member states. The maximum amount of residue that may remain on the harvested crop (MRL) is also set at EU level and applies to all crops grown in EU Member states. These MRLs also apply to imported crops, unless a different import tolerance is in place.

However, pesticidal products applied to hops grown in one country must be registered by the regulatory authorities of that country for use on hops. The active ingredients chosen from the overall EU list can differ from country to country, even within the EU, because disease and pests can also vary between countries. Thus, the list of active ingredients which are allowed on hops in the UK differs from the list allowed in other EU countries, although there may be many similarities. In the UK, the Health and

Safety Executive (HSE) maintains a searchable online database of registrations of pesticides for all crops grown in the UK:

https://secure.pesticides.gov.uk/pestreg/

Off-label registration.

In some cases, the registration for a pesticide on hops is "Off-label". This type of registration can be obtained by user-groups rather than by the pesticide manufacturers. Off label registration on a minor crop such as hops can be obtained for pesticides which are fully registered in the UK for use on other, mainstream, crops. Details do not necessarily appear on the product label. It is common for minor crops such as hops, where it may not be economically worthwhile for a manufacturer to pursue full registration. Responsibility for demonstrating efficacy lies with the registrant (in this case the user-group) rather with the manufacturer. An off-label registration is automatically cancelled if the full registration on major crops is cancelled or withdrawn in the UK for any reason. A searchable online database of off-label registrations is maintained by the HSE.

https://secure.pesticides.gov.uk/approvaldocs/PublicDocSearch.aspx

A list of pesticides which are currently (as of July 2018) registered for use on commercial hops grown for brewing in the UK is given in **Annex 1**.

The residues of any pesticide used must not exceed the EU MRL for that pesticide on hops.

The EU MRLs for hop pesticides are shown in the Annexes to this document but can also be found in an online searchable database maintained by the EU.

http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=homepage&language=EN

For many years, the BBPA and Campden BRI have been testing new pesticides which are proposed for use on the major raw materials of beer – hops and malted barley - in the UK to ensure that they do not affect the flavour, quality or safety of beer, or the efficiency of the brewing process. Similar testing may be carried out by other institutions, such as the IFBM in France. The results of any such tests are indicated in the "Acceptability for Brewing" column of the list in Annex 1.

5: Hops grown in the EU outside of the UK

As explained above, different active ingredients may be selected by different EU member states for use on hops, depending upon the range of pests and diseases experienced in their country. All ingredients must however be authorised by the EU and listed in the relevant EU legislation (Regulation 1107/2009 and its amendments). MRLs are also set by the EU for each crop/chemical combination (Regulation 396/2005 and its amendments).

Hops grown in one EU country can be exported to any other EU country provided that the pesticides used are:

Authorised at EU level

- Registered in the country where the hops are grown, for use on hops. They do NOT need to be registered for hops in the importing country.
- Residues do not exceed the EU MRL for that pesticide on hops

A list of hop pesticides and their registration in different hop growing countries in the EU, together with the relevant MRLs, is given in **Annex 2**. Further information on registrations in individual EU and non-EU countries can be accessed via the following link:

https://www.eppo.int/PPPRODUCTS/information/information_ppp.htm

6. Hops grown in countries outside the EU

Many countries outside the EU also have their own systems for assessing, authorising and controlling pesticides used on crops grown within their jurisdictions. However, the pesticides authorised for use on any one crop can differ widely between different countries, depending upon pest and disease pressure and historical factors. Thus, the list of pesticides allowed on hops in the US for example, is very different from those allowed in the EU. The maximum residue allowed can also differ significantly.

Hops which are treated with a pesticide which is legal in the country of origin but not authorised in the EU can be legally used in EU countries only if the **EU MRL is not exceeded.** A pesticide which is not authorised in the EU will generally have an MRL set at the limit of detection unless an import tolerance has been set up.

Some countries adopt Codex MRLs (set by the Codex Alimentarius of the FAO and the WHO) to facilitate international trade. However, the Codex process is relatively slow, and Codex MRLs are often not available for the newest pesticides, or for all crop/chemical combinations.

A list of MRLs set by some of the main hop-growing countries for pesticides used on hops is given in **Annex 3**.

Changes made to Annex 1 since March 2017

Agrochemical	Туре	Changes
Ametoctradin	Fungicide	Added to list
Cymoxanil	Fungicide	MRL reduced from 2 to 0.1 mg/kg
Fenpropimorph	Fungicide	MRL reduced from 10 to 0.05 mg/kg
Metalaxyl	Fungicide	MRL increased from 10 to 15 mg/kg
Myclobutanil	Fungicide	Authorisation extended to 31/10/2018
Abamectin	Insecticide	Authorisation extended to 31/05/2019
Acequinocyl	Insecticide	Added to list
Chlorantraniliprole	Insecticide	Added to list
Imidacloprid	Insecticide	Authorisation revoked
Pymetrozine	Insecticide	Authorisation extended to 31/12/2020
Spirodiclofen	Insecticide	Authorisation extended to 31/05/2019
Carfentrazone-ethyl	Herbicide	Authorisation extended to 31/01/2021
Diquat	Herbicide	Authorisation extended to 31/12/2020
Isoxaben	Herbicide	Authorisation extended to 30/11/2023
Ammonium Aluminium Sulphate	Miscellaneous	Authorisation extended to 31/12/2021

Changes made to Annex 2 since March 2017

Agrochemical	Туре	Changes
Acequinocyl	Acaricide	Added to list for Poland
Ametoctradin	Fungicide	Added to list for Czech Republic and Poland
Azadirachtin	Insecticide	Added to list for Germany

Bacillus thuringiensis	Insecticide	Added to list for Czech Republic and Poland
Chlorantraniliprole	Insecitide	Added to list for UK
Cypermethrin	Insecticide	Authorisation revoked in several countries
Deltamethrin	Insecticide	Authorisation revoked
Dimethomorph	Fungicide	Added to list for Czech Republic and UK
Diquat	Herbicide	Authorisation revoked in Germany and Slovenia, added for Czech Republic
Flonicamid	Aphicide	Added to list for Poland
Fluazifop-p-butyl	Herbicide	Added to list for Poland
Flumioxazin	Herbicide	Added to list for Germany
Fluopicolide	Fungicide	Added to list for Poland and Slovenia
Fluopyram	Fungicide	Added to list for Poland
Folpet	Fungicide	Added to list for Poland
Glyphosate	Herbicide	Added to list for Germany
Imidacloprid	Aphicide	Added to list for Poland; revoked in UK, note added regarding usage restrictions.
Indoxacarb	Insecticide	Added to list for France
Mancozeb	Fungicide	Added to list for Germany and Spain
Mandipropamid	Fungicide	Added to list for Slovenia
МСРА	Herbicide	Revoked in all countries
Metiram	Fungicide	Added to list for Germany
Metrafenone	Fungicide	Added to list for Germany and Slovenia
Milbemectin	Acaricide	Added to list for Poland

Myclobutanil	Fungicide	Authorisation revoked for several countries
Potassium bicarbonate	Fungicide	Added to list for several countries
Propargite	Acaricide	Revoked in all countries
Pyraclostrobin	Fungicide	Added to list for Czech Republic and Belgium
Sheep fat	Repellent	Added to list for several countries
Spirodiclofen	Acaricide	Added to list for Spain
Spirotetramat	Aphicide	Added to list for Slovenia
Tau-Fluvalinate	Insecticide	Added to list for France
Tebuconazole	Fungicide	Revoked in all countries
Thiamethoxam	Insecticide	Note added regarding usage restrictions
Trifloxystrobin	Fungicide	Added to list for Poland

	ANNEX 1: UK	ANNEX 1: UK Approvals for pesticides	es on outdoor hops	· hops	
Active	Product Name (not exhaustive)	Acceptability for brewing	Latest UK expiry date	Comments	EU/UK MRL as of March 2018
Key: * value at limit of detection		**Extension of Authorisation for Minor Uses ("Off-label") allows a product which is authorised for use on a major crop to be used on a minor crop such as hops for as long as the product retains its main authorisation. Efficacy and phytotoxicity on the minor crop has not been tested: this is the user's responsibility.	on for Minor U major crop to retains its mai crop has not	ation for Minor Uses ("Off-label") allows a product whic a major crop to be used on a minor crop such as hops ct retains its main authorisation. Efficacy and or crop has not been tested: this is the user's	a product which p such as hops y and user's
Fungicides					
Boscalid	Bellis (also contains pyraclostrobin)	Limited small scale trials with treated barleys at IFBM showed no effect on beer quality. Accepted for barley, but prior to ear emergence only. Hops not tested .	31/07/2019	UK authorisation under Minor Uses Authorisation**	80
Bupirimate	Nimrod	Accepted on the basis of brewing trials at Campden BRI	31/12/2021		10
Cymoxanil	Option	Accepted on the basis of brewing trials at Campden BRI	28/02/2022	UK authorisation under Minor Uses Authorisation**	<mark>0.1</mark>
Fenpropimorph	Corbel	Accepted on the basis of brewing trials at Campden BRI	31/12/2021	UK authorisation under Minor Uses Authorisation**	0.05*
Mandipropamid	Revus	Not tested	31/01/2026	UK authorisation under Minor Uses Authorisation**	90
Metalaxyl -M	SL 567A	Accepted on the basis of brewing trials at Campden BRI	31/12/2019	UK authorisation under Minor Uses Authorisation**	<mark>15</mark>
Myclobutanil	Systhane 20 EW	Not tested	31/10/2018	UK authorisation under Minor Uses Authorisation**	O O
Potassium bicarbonate	Potassium bicarbonate	Accepted on the basis of evaluation at Campden BRI	31/08/2019	Authorised as a commodity substance	No limit set
Pyraclostrobin	Bellis (also contains boscalid)	Limited small scale trials with treated barleys at IFBM showed some small effect on alcohol production. Accepted for barley, but prior to ear emergence only	31/07/2019	UK authorisation under Minor Uses Authorisation**	15

Carfentrazone-ethyl Sh	Herbicides	Tebufenpyrad	Spirotetramat	Spirodiclofen	Pyrethrins	Pymetrozine	Lambda-cyhalothrin	Flonicamid	Chlorantraniliprole	Bacillus thuringiensis	Acequinocyl	Abamectin	Insecticides and Acaricides	Sulphur	Quinoxyfen
Shark, Spotlight		Masai	Movento	Envidor	various	Plenum WG	Hallmark	Mainman	Coragen	Lepinox Plus	Kanemite	Dynamec		Kumulus DF	Fortress
Accepted on the basis of evaluation at Campden BRI		Accepted on the basis of brewing trials at Campden BRI	Not tested	Not tested	Accepted on the basis of brewing trials at Campden BRI with several synthetic pyrethroids for both barley and hops.	Accepted on the basis of brewing trials at Campden BRI	Accepted on the basis of brewing trials at Campden BRI	Not tested	Not tested	Not tested	Not tested	Not tested		Accepted for use before burr stage only on the basis of brewing trials at Campden BRI	of trials at TNO. Not tested with hops.
31/01/2021		30/06/2019	30/04/2019	31/05/2019	31/12/2021	31/12/2020	31/12/2018	28/02/2023	31/12/2020	30/10/2021	30/09/2018	31/05/2019		31/12/2021	31/10/2019
General acceptance for all edible crops			UK authorisation under Minor Uses Authorisation**	UK authorisation under Minor Uses Authorisation**	General acceptance for all edible crops. Pyrethrins are natural products and allowed for organic crops.	UK authorisation under Minor Uses Authorisation**	UK authorisation under Minor Uses Authorisation**	UK authorisation under Minor Uses Authorisation**	UK authorisation under Minor Uses Authorisation**		UK authorisation under Minor Uses Authorisation**	UK authorisation under Minor Uses Authorisation**			Minor Uses Authorisation**
0.02*		1.5	15	40	0.5	15	10	ω	10	0.01*	<mark>15</mark>	0.1		no MRL required	2

Diquat	Dragoon	Accepted on the basis of established use prior to 1980 with no problems.	31/12/2020		0.01*
Fluazifop-P	Fusilade Max	Accepted on the basis of evaluation at Campden BRI	31/12/2021		0.05*
Glyphosate (including trimesium salt)	various	Accepted on the basis of brewing trials at Campden BRI using treated barley	30/06/2020	General acceptance for all edible crops	0.1* (0.05* for trimesium ion)
Isoxaben	Flexidor	Accepted on the basis of established use prior to 1980 with no problems.	30/11/2023		0.05
Propyzamide	Kerb Flo	Accepted on the basis of early application and established use prior to 1980 with no problems.	31/07/2020	UK authorisation under Minor Uses Authorisation**	0.05*
Pyraflufen-ethyl	Quickdown	Not tested	31/12/2018	UK authorisation under Minor Uses Authorisation**	0.1*
Defoliants					
Diquat	Reglone	Accepted on the basis of brewing trials at Campden BRI	31/12/2020	UK authorisation under Minor Uses Authorisation**	0.01*
Aluminium ammonium sulphate	various	Not tested	31/12/2021	Animal repellent, approved for all edible crops	default (0.01*)
Metaldehyde	various	Accepted on the basis of application type and established use prior to 1980 with no problems.	31/12/2021	Slug bait, approved for all edible crops. Applied to soil.	0.1*

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Not tested	80	Percos	na	na	na	na	na	Orvego	Forum	Fungicide	Dimethomorph
Accepted on the basis of brewing trials at Campden BRI	<mark>0.1</mark>	Option	na	na	na	Curzate Cu 49,5 WP	na	Curzate K	Aktuan	Fungicide	Cymoxanil
Accepted on the basis of brewing trials at Campden BRI using metalaxyl-copper mixture	1000	na	various	various	various	various	various	various	Funguran	Fungicide	Copper
Not tested	<mark>10</mark>	Coragen	na	na	na	na	na	na	na	Insecticide	Chlorantraniliprole
Accepted on the basis of evaluation at Campden BRI	0.02*	Spotlight #	na	na	Spotlight Plus	na	na	na	na	Herbicide	Carfentrazone-ethyl
Accepted on the basis of brewing trials at Campden BRI	10	Nimrod	na	Nimrod, Quatro	na	na	na	na	na	Fungicide	Bupirimate
Accepted on the basis of brewing trials on barley, 2004	80	Bellis	Bellis	na	na	na	na	Bellis	Bellis	Fungicide	Boscalid
Not tested	20	na	na	na	na	na	na	Acramite 480 SC	na	Acaricide	Bifenazate
Not tested	0.01*	Lepinox Plus	na	na	Lepinox Plus	Lepinox Plus	Lepinox Plus	Lepinox Plus	na	Insecticide	Bacillus thuringiensis
Accepted on the basis of brewing trials on barley, 1997	30	na	na	na	na	na	Ortiva	Ortiva	Ortiva	Fungicide	Azoxystrobin
Not tested	0.01	na	na	na	na	<mark>na</mark>	na	na	Lizetan AZ	Insecticide	Azadirachtin
Not tested	100	Percos	na	na	na	na	na	Orvego	Orvego	Fungicide	Ametoctradin
Not tested	0.05*	na	na	na	na	na	na	Mospilan 20 SP	na	Aphicide	Acetamiprid
Not tested	15	Kanemite	Kanemite	na	na	Kanemite 150 SC	Kanemite SC	Kanemite 15 SC	Kanemite	Acaricide	Acequinocyl
Not tested	0.1	Dynamec	na	na	Vertimec	na	Vertimec Pro	Vertimec	na	Acaricide	Abamectin
BBPA: Acceptability for Brewing.	EU MRL (ppm)	UK 2018	Belgium 2018	Spain 2018	France 2018	Poland 2018	Slovenia 2018	Czech Rep. 2018	Germany 2018	Activity	Chemical Active Ingredient

Not tested	90	Revus	Revus	na	na	na	Revus	Revus	Revus	Fungicide	Mandipropamid
Not tested	25	na	na	Vondozeb	na	na	na	na	Acrobat Plus WG	Fungicide	Mancozeb
Accepted on the basis of brewing trials at Campden BRI	10	Hallmark	Karate Zeon	Karate King-Zeon	Karate Xpress	Karate Zeon 050 CS	Karate Zeon 5 CS	Karate Zeon 050 CS	Karate Zeon	Insecticide	Lambda- Cyhalothrin
Accepted on the basis of established use prior to 1980 with no problems.	0.05	Flexidor	na	na	na	na	na	na	na	Herbicide	Isoxaben
Not tested	0.05*	na	na	na	Steward	na	na	na	na	Insecticide	Indoxacarb
Accepted on the basis of brewing trials at Campden BRI	10	na	Confidor 200SL	na	na	Diament 200 SL	Confidor 70 WG	Confidor 200 OD	Confidor 70 WG	Aphicide	lmidacloprid †
Not tested	20	na	Nissorun	na	na	na	Nissorun 10 WP	Nissorun 10 WP	na	Acaricide	Hexythiazox
Accepted on the basis of brewing trials at Campden BRI using treated barley	0.1*	various #	na	na	na	na	na	na	various	Herbicide	Glyphosate
Accepted on the basis of brewing trials at Campden BRI	1500	na	Aliette	various	Aliette flash	Aliette 80 WG	Aliette Flash	Aliette 80 WG	Aliette WG	Fungicide	Fosetyl-Al
Not tested	400	na	na	na	na	na	Folpan 80 WG	Folpan 80 WG	na	Fungicide	Folpet
Accepted on the basis of brewing trials at Campden BRI using treated barley	ω	na	na	na	na	Luna Sensation 500 SC	na	na	na	Fungicide	Fluopyram
Not tested	0.7	na	na	na	na	na	Profiler	Profiler	Profiler	Fungicide	Fluopicolide
Not tested	0.1*	na	na	na	na	na	na	na	Nozomi	Herbicide	Flumioxazin
Accepted on the basis of evaluation at CampdenBRI	0.05*	Fusilade	na	na	na	Fusilade Forte 150 EC	na	Fusilade Forte 150 EC	Fusilade Max	Herbicide	Fluazifop-p-butyl
Not tested	3	Mainman	Teppeki	na	Teppeki	Teppeki 50 WG	Teppeki	Teppeki	Teppeki	Aphicide	Flonicamid
Not tested	<mark>15</mark>	na	na	na	na	na	na	Ortus 5 SC	na	Acaricide	Fenpyroximate
Accepted on the basis of brewing trials at Campden BRI	0.05	Corbel	na	na	na	na	na	na	na	Fungicide	Fenpropimorph
Not tested	100	na	various	na	na	na	na	na	Delan WG	Fungicide	Dithianon
Accepted on the basis of established use prior to 1980 with no problems.	0.01*	Regione	various	na	various	na	na	Desiq	na	Herbicide	Diquat

Not tested	0.05	na	na	na	na	na	na	Actara 25 WG	Actara	Insecticide	Thiamethoxam †
Accepted on the basis of brewing trials at Campden BRI	1.5	Masai	Masai 20 WP	na	na	na	na	na	na	Acaricide	Tebufenpyrad
Not tested	<mark>10</mark>	na	na	na	Klartan	na	na	na	na	Insecticide	tau-Fluvalinate
Accepted for use before burr stage only on the basis of brewing trials at CampdenBRI	exempt	various	various	Sulfur	various	Siarkol 80 WG	Kumulus DF	Kumulus WG	Kumulus WG	Fungicide	Sulphur
Not tested	15	Movento	Movento 100SC	na	na	Movento 100 SC	Movento SC 100	Movento 150 OD	na	Aphicide	Spirotetramat
Not tested	40	Envidor	na	Envidor	na	na	na	na	Envidor	Acaricide	Spirodiclofen
Not tested	exempt	na	Trico	na	na	na	Trico	Trico	Trico	Repellent	Sheep fat
Accepted for barley on the basis of trials at TNO. Not tested with hops.	N	Fortress	Fortress	na	na	na	na	IQ-Crystal	Fortress 250	Fungicide	Quinoxyfen
Not tested	0.1*	Quickdown	na	na	na	na	na	na	Quickdown	Herbicide	Pyraflufen-ethyl
Accepted for barley. Not tested for hops.	15	Bellis (+boscalid)	Bellis (+boscalid)	na	na	na	na	Bellis	Bellis	Fungicide	Pyraclostrobin
Accepted on the basis of brewing trials at Campden BRI	15	Plenum 50WG	Plenum	na	Plenum 50WG	na	Chess 50 WG	Plenum	Plenum 50 WG	Aphicide	Pymetrozine
Accepted on the basis of early application and established use prior to 1980 with no problems.	0.05*	Kerb Flo	na	na	na	na	na	na	na	Herbicide	Propyzamide
Accepted on the basis of evaluation at CampdenBRI	exempt	Potassium Bicarbonate	na	na	Potassium Bicarbonate	na	Vitisan	Kumar	Kumar	Fungicide	Potassium bicarbonate
Accepted on the basis of brewing trials at Campden BRI	5	Systhane 20 EW	na	na	na	na	Systhane 20 EW	na	Systhane 20 EW	Fungicide	Myclobutanil
Not tested	0.2*	na	na	na	na	Koromite 10 EC	Milbeknock	na	Milbeknock	Acaricide	Milbemectin
Nor tested	80	na	Flexity	na	na	na	Vivando	na	Vivando	Fungicide	Metrafenone
Not tested	25	na	Polyram	na	na	na	na	na	Polyram WG	Fungicide	Metiram
Accepted on the basis of application type and established use prior to 1980 with no problems.	0.1*	Metarex#	na	na	na	na	na	na	na	Mollusicide	Metaldehyde
Accepted on the basis of brewing trials at Campden BRI	<mark>:</mark> 5	SL567A	na	na	Subdue Gold	na	Fonganil Gold	Ridomil Gold Combi Pepite	na	Fungicide	Metalaxyl-m / Mefenoxam

	* = Limit of Determination	# = approval for use on all edible crops			ed.	na = not approved					
Accepted for barley. Not tested for hops.	40	na	na	na	Flint	Luna Sensation 500 SC	Zato 50 WG	na	Flint	Fungicide	Trifloxystrobin
Accepted on the basis of established use prior to 1980 with no problems.	10	na	na	Bayfidan 312 SC	na	na	na	na	Bayfidan	Fungicide	Triadimenol

† Imidacloprid and Thiamethoxam- Commission Implementing Regulation (EU) 2018/783 and Commission Implementing Regulation (EU) 2018/785 has amended the conditions of authorisations for these active substances. Any plants treated with these substances must remain within a permanent greenhouse for the entire life cycle of the product. Plants resulting from any seeds treated with these active substances must also remain in a permanent greenhouse for their entire lifecycle. Grace periods are set to expire 19 December 2018. Any use on crops outside of permanent greenhouses after this date will not be permitted.

aluminium sulphate	alpha-cypermethrin	aldrin + dieldrin	Aldicarb	Acetamiprid	Acephate	Acequinocyl	A bamectin	Issue or date accessed	Data Source	Chemical	Approved in at least one EU country	MRL LOWER than	close to EU	MDI como o	MRL HIGHER than	COLOUR CODE	Notes: * = i	Annex 3: No	
hate	thrin	_						Cessed			at least ntry	R than	SOF		₹ than	DE	* = limit of detection:	on-EU Re	
							0.1	As of March	APVMA	Australia		Values in B * = val	E = extı Default vai					Annex 3: Non-EU Registration and MRLs for pesticides used on HOPS	
							0.2	As of March 2018 default = 0.1mg/kg	Health Canada	Canada		OLD are high ue set at the	raneous (ie n lue is residue	$T = te_1$	>		above the li	d MRLs fo	
							0.1	As of March 2018	US FAS Online database	China		Values in BOLD are higher than the detection limit * = value set at the limit of determination	E = extraneous (ie no current registration) Default value is residue allowed if no MRL is set	T = temporary	KEY		MRLs above the limit of detection are in bold	or pesticides	
						4	0.1	As of March	LN 73 of 2012	Hong Kong		ection limit nation	ration) 1RL is set				n are in bold	used on Ho	
	20	0.06				15	0.2	as of March 2018 default = 0.01	Japan Food Chemical Research Foundation	Japan								OPS	
				0.05	0.05	15	0.1	As of March 2017, source, US FAS Online database. RSA follows either EU or Codex MRLs	US FAS Online database	South Africa									
					0.02	15	0.2	FAS Online database, as of March 2018	US FAS Online database	US									
							0.15	As of March 2018	Codex database	WHO									
default	30	0.02*	0.05*	0.05	0.05	15	0.1	As of March 2018	EU MRL Database	EU	contaminants such as DD1). NL = no limit needed. Default =0.01mg/kg	other country. (Except for ubiquitous environmental	for chemicals known to have	chemical is not used on that	combinations even if the	In the EU, MRLs are set for			

0.05*				10					carbofuran
0.1*				0.1					Carbendazim
default				0.1					butylamine
51									buprofezin
10									bupirimate
0.1*									bromoxynil
0.05*				_					bromopropylate
0.1*									bromophos-ethyl
20				400	400				bromide (inorganic)
default				0.001					brodifacoum
80	60	35	60	60	60	(proposed)	35	0.5	boscalid
						60			
0.1*				0.1					bitertanol
default				0.1					bioresmethrin
default				0.008					bilanafos
20	20	10	20	20	20	20			bifenthrin
20	20	15	20	20		20	15	3(T)	bifenazate
default				0.02					benzyladenine
0.1*				0.02					Bentazone
default				0.03					Bensulide
default									bensulfuron-methyl
				see carbendazim	see cart				Benomyl
0.1*				Ŋ					Benfuracarb
0.1*				0.2					Benalaxyl
0.1*									Barban
30	30	20	30	30	30	30 (proposed)	20		Azoxystrobin
0.1*				0.1*					Atrazine
0.05*				0.1				0.1*	Asulam
0.1*									Aramite
0.05*								0.01*	Amitrole
100	30	100	15	30			60		Ametoctradin
default									aluminium ammonium sulphate

0.05 5 0.05* 0.05* 1000 default default default 0.2			0.01					cyanamide
			0.01				_	
			0.00					4-CPA (chlorophenoxyacetic acid)
								copper tetraphthalate
			0.04					copper nonylphenolsulfonate
			see individual salts					copper (from copper salts)
0.05			0.1					clothianidin
0.05	رى د	Ŋ	СЛ	51		ე	2	clopyralid
			0.02*					clomazone
0.05*			0.2				0.2*	clofentezine
0.05*			0.02					clodinafop-propargyl
	0.5	0.1						clethodim
0.1*			0.1					cinidon-ethyl
0.1*								chlozolinate
0.1*			0.1*					chlorpyrifos-methyl
0.1*		0.1*	0.1*					chlorpyrifos
0.1*								chloroxuron
60			0.1					chlorothalonil
0.1*			0.1*					chlorobenzilate
0.1*			0.1*					chlormequat
default			0.05					chlorfluazuron
0.1*								chlorfenson
0.05*		0.05						chlorfenapyr
0.02*			0.02					chlordane
0.1*								chlorbufam
0.1*								chlorbenside
4.0 10	40	0.02*	90	90	40 (proposed)	40	0.01*	chlorantraniliprole
default			10					сапар
	0.1	0.02*	0.3	0.1		0.1	0.05*	carfentrazone ethyl
0.05*			1					carbosulfan

Cyclobprothin Cocklosprothin COCZ COCZ Cocklosprothin Cyclubrin 20 <t< th=""><th>0.1*</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>dinoterb</th></t<>	0.1*									dinoterb
dhrinh Minn O.02 O.02 O.05 <	0.1*				0.1*					dinoseb
### Min	80	80	60	80	80	80	80	40		dimethomorph
### Attinin	0.05*				0.05*					Dimethoate
bitinin 0.02 0.02 20	0.1*				0.04*					Dimethipin
Itim 0.02 0.02 20 <	0.05		0.05	0.02*		0.05				dimethanamid-P
binin 0.02 0.02 dim 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20			0.05	0.02*	0.05					dimethenamid
binin 0.02 0.02 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.00 <t< td=""><td>default</td><td></td><td></td><td></td><td>0.05</td><td></td><td></td><td></td><td></td><td>diflufenzopyr</td></t<>	default				0.05					diflufenzopyr
birin 0.02 0.05*	0.05*									Diflufenican
binin 0.02 0.02 0.05 <t< td=""><td>0.05*</td><td></td><td></td><td></td><td>0.05*</td><td></td><td></td><td></td><td></td><td>diflubenzuron</td></t<>	0.05*				0.05*					diflubenzuron
binin 0.02 0.05*	default				0.05					difenzoquat
bitim 0.02 0.05*	50			50	50	50			5	Dicofol
Ibrinin 0.02 0.02 0.02 0.02 0.05	default				0.02					diclomezine
thrinin 0.02 0.02 lim 20 20 20 20 20 nil 7 7 2 3 3 3 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	0.02*				0.1					dichlorvos
Shrin O.02 O.05*	0.1				0.1					dichlorprop
Shrin Unillim	0.1*				0.1*					1,1-dichloro-2,2-bis(4- ethylphenyl)ethane
thrin Image: strict of the light of the lig	default				5					dichlofluanid
thrin 0.02 0.02 dim 0.05* 0.05* 20	0.5	0.5			0.5	0.5		0.25		diazinon
thrin thrin 0.02 0.02 0.05* 0	0.1*									diallate
thrin 0.02 0.02 1 0.05* 0.05* 1 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 30 30 30 30 30 4 30 30 30 30 30 4 30	default				0.02					diafenthiuron
thrin 0.02 0.02 0.02 0.05 <t< td=""><td>default</td><td></td><td></td><td></td><td>0.05</td><td></td><td></td><td></td><td></td><td>demeton-S-methyl</td></t<>	default				0.05					demeton-S-methyl
thrin 0.02 0.02 0.02 0.05* 0.	0.1			5	5					deltamethrin
thrin 0.02 0.03 0.1* 0.2 0.02 0.03 <th< td=""><td>0.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>dalapon</td></th<>	0.1									dalapon
thrin 0.02 0.02 lim 0.05* 0.05* 1 20 20 20 20 20 7 7 2 7 2 20 <th< td=""><td>0.05*</td><td></td><td></td><td></td><td>0.05</td><td></td><td></td><td></td><td></td><td>DDT + DDE + TDE</td></th<>	0.05*				0.05					DDT + DDE + TDE
prothrin 0.02 0.02 0.02 0.05* <th< td=""><td>default</td><td></td><td></td><td></td><td>0.5</td><td></td><td></td><td></td><td></td><td>DBEDC</td></th<>	default				0.5					DBEDC
0.01* 0.01* 0.02 0.02 0.05* 0	0.1*		0.2	0.1*	0.08					2,4-D
0.02 0.02 0.05* 0.05* 20 20 20 10 7 7 2 7	30				20				0.01*	cypermethrin
0.02 0.02 0.05* 0.05* 20 20 20 20 20	0.1		7	2	7	7				cymoxanil
20 20 <td< td=""><td>default</td><td></td><td></td><td></td><td>10</td><td></td><td></td><td></td><td></td><td>cyhalothrin</td></td<>	default				10					cyhalothrin
0.02	20		20	20	20	20				cyfluthrin
0.02	0.05*				0.05*					cycloxydim
	default				0.02					cycloprothrin

0.1*				700					fenhexamid
•									fenchlorphos
0.1*				25				20	fenbutatin oxide
0.01*		30							fenazaquin
	5	0.1*	O	O1	5	5			fenarimol
0.05*				0.05*					fenamiphos
0.05*		80	0.05*	80	80				Famoxadone
15	15	7	15	15		15 (proposed)	7		etoxazole
0.02*				0.02*					ethylene dichloride
0.02*				0.01*					ethylene dibromide (EDB)
default									ethyclozate
0.05*									ethoxyquin
0.02*		0.02	0.02*		0.02		0.02		ethoprop (ethoprophos)
10									ethirimol
default									ethiofencarb
0.1*				0.1*					ethephon
0.05*			0.05*	U I				see fenvalerate	esfenvalerate
0.1									epoxiconazole
0.1*				0.1*					endrin
default		0.1							endothall
0.1*				0.1*					E ndosulfan
default				0.05					2,2-DPA
0.05				0.02					diuron
	30			30	30			10 (T)	dithiocarbamates
100	300	100 import tolerance		100	100				dithianon
0.05*				0.3				0.5	disulfoton
0.01*		0.2	0.1*	0.04*				0.2	diquat
0.05*				0.05*					diphenylamine
0.1*									dioxathion

0.1*		7	0.1*	0.1	7			0.1*	glyphosate
0.1*				0.2				1 (T)	glufosinate ammonium
None									Gibberellic acid
									furfural
0.05*				(J)					furathiocarb
1500		45	1500	1440	45				fosetyl aluminium
0.05*									formothion
400		120	150	120	120				folpet
see tau-fluvalinate (10)				10					fluvalinate
0.05*		20							flutriafol
0.1*				0.1*					fluroxypyr
default									fluridone
4		10		10			10		flupyradifurone
default				0.04					fluoroimide
10									fluoride ion
သ		60		60			60		Fluopyram
0.7		30							fluopicolide
0.02*				0.02*					fluometuron
0.1*		0.05	0.1*	0.05	0.05				flumioxazin
0.1*				10					flucythrinate
0.05*				0.05				0.05	fluazifop-P butyl
ω	20	20	2	ζī	7		7		flonicamid
0.02*				0.02*					flazasulfuron
0.01*				0.002*					fipronil
Z					exempt				ferric phosphate
0.05*				51					fenvalerate
0.1*				0.5					fentin
15	10	10	10	15	10	10 (proposed)	10		fenpyroximate
0.05*				0.1					fenpropimorph
0.02*				0.5					fenpropathrin
0.05"				0.05*					renoxycarb

10 (T) 6 (proposed) 10 0.1* 0.01*	0.1* 0.05 0.05 0.02 0.02 0.02* 0.02* 0.2*	10 10 50	50 10 6	90
T) 6 (proposed) * 0.01* 0 0 0 0 0 0 0 0 0		10 10 0.02*		10
T) 6 (proposed) * 0.01* 0.01* 0.00*		10		10 6
T) 6 (proposed)		10 0.02*		
T) 6 (proposed)		10 10 0.02*		
T) 6 (proposed)		10		10
T) 6 (proposed)		10		10
(T) 6 (proposed)		10		10
(T) 6 (proposed)		10		
(T) 6 (proposed)		_	0	
T) 6 (proposed)		_	0	
(T) 6 (proposed)		_	0	
(T) 6 (proposed)		_	0	
T) 6 (proposed)		_	0	
	0.1* 0.05 0.05			
	0.1*			
	0.1*			
	0.02			
				0.2
	0.01	0.0	0.02*)2*
	1			
9 3 2	2 25		20	20 20
	0.05*			
	0.02*			
	0.01*			
	0.02*			

0.1*	50			50	50				permethrin
0.05*		0.1						0.1*	pendimethalin
0.5	0.5			0.5	0.5	0.5			penconazole
0.05*				0.05					parathion methyl
0.1*				0.6					parathion
0.05*	0.1	0.5	0.1	0.2	0.5	0.1		0.2	paraquat
0.02*				0.05					oxydemeton-methyl
default				10					oxine-copper
0.05*									Oxadiazon
0.01*		ယ		3	ယ				norflurazon
0.01*			0.01*						novaluron
default				0.03					nitenpyram
default		0.5		0.1	0.5				Naled
5	5	10	2	10	2	2			myclobutanil
0.1*									monolinuron
0.1*									molinate
0.2*				0.1					milbemectin
default		O I							MGK 264 (n-octyl bicycloheptene dicarboximid
0.1*				0.1*					metribuzin
80		70					60		metrafenone
25				30	30				metiram
0.1*				0.1*					methoxychlor
0.05		12 Import tolerance		8				0.5	methomyl
0.1*									methiocarb
0.1*	5			5	5				methidathion
0.02*				5					methamidophos
0.1*									methacrifos
0.1*		0.1*							metaldehyde
15		20	10	10					metalaxyl-M
	10				10	10	8		metalaxyl

	40	40	30	40	40	40	40 (proposed)	40	fen	spirodiclofen
O.02 O.05* Z O.05* O	0.1*		22	22		22				spinosad
O.02 O.05* 2	0.1*		22	0.1*					m	S pinetorum
0.02	0.2*			0.2*	0.2				Ξ̈́	Resmethrin
0.02 0.05* 2	0.1*				0.05				Ф	quintozene
O.02 O.05* 2 O.05* O.05* 2 O.05* O.05*	2	_	အ	_	_	1	_	2.5	5	quinoxyfen
O.02 O.05* 2	0.1*				0.1*					Quinalfos
O.02 O.05* Z O.05* O.05*	0.05*			0.05*					en	pyriproxyfen
0.02	10		10	10	10	10				pyridaben
2 0.02 0.05* 2 0.02* 0.05* 2 0.05* 0.02* 0.05* 2 0 0.001 0.001 0 0 0.05* 0.05* 0 0 0.05* 0.05* 0 0 0.03 0.1* 0 0 0.1* 0.1* 0 0 0.1* 0 0 0 0.1* 0 0 0 0.1* 0 0 0 0.1* 0 0 0 0.1* 0 0 0 0.1* 0 0 0 0.1* 0 0 0 0.05* 0 0 0 0.1* 0 0 0 0 0.1* 0 0 0 0 0 0.05* 0 0 0 0 0 0.05* 0 0 0 0 0 0.05* 0 0 0 0 0 0.05* 0 0 0 0 0 0.05* 0 0 0 0 0	0.5			0.5	0.05					pyrethrins
0.02 0.05* 2	0.1*				0.1*				OS .	pyrazophos
2 0.02 0.05* 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	default				0.02*				ate	pyrazolynate
15 15 15 15 15 15 15 15	0.1*				0.05				-ethyl	pyraflufen-ethyl
2 0.02 0.05* 2 0.02* 0.05* 2 0.00* 0.001 0.001 0.001 0.001 0.05* 0.05* 0.001 0.001 0.05* 0.03 0.03 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.01* 0.00* 0.01* 0.01* 0.01* 0.00*	15	15	23	15	15	15	15 (proposed)	23	obin	pyraclostrobin
0.02 0.05* 2	15		6	15	15	6		6	ne	pymetrozine
2 0.02 0.05* 2 0.02* 0.05* 2 0.02* 0.001 0.001 0.05* 2 0.05* 0.05* 2 0.03* 0.05* 0.05* 0.05* 0.05* 0.03 0.03 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1*	0.05*								ide	propyzamide
2 0.02 0.05* 2 0.02* 0.05* 2 0.001 0.05* 2 0.05* 0.05* 2 0.05* 0.05* 3 0.05* 0.05* 3 0.05* 0.05* 3 0.01* 0.1* 30 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1*	0.1*				0.1*					propoxur
2 0.02 0.05* 2 0.02* 0.05* 2 0.001 0.05* 2 0.001 0.05* 2 0.05* 0.05* 2 0.05* 0.05* 2 0.05* 0.03 3 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1*	25				30					propineb
2 0.02 0.05* 2 0.02* 0.05* 2 0.05* 0.02* 0.001 0.001 0.001 0.05* 0.05* 0.001 0.001 0.05* 0.03 0.03 0.03 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1* 0.1*	0.1*				0.1*				zole	propiconazole
0.02 0.05* 2 0.02* 2 3 0.001 2 3 0.001 2 3 0.005* 2 3 0.05* 3 4 0.03 4 4 0.1* 4 <	0.05*	100	100	100	100	100		30		propargite
0.02 0.05* 2 0.02* 0.05* 2 0.001 2 2 0.001 2 3 0.05* 3 4 0.03 4 4 0.1* 4	0.1*				0.1*				prohexadione calcium	prohexadi
0.02 0.05* 2 0.02* 2 3 0.001 2 3 0.001 3 4 0.05* 4 4 0.03* 4 4 0.1* 4 4 0.1* 4 4 0.1* 4 4 0.03 4 4 0.1* 4 4	0.05*				0.1*				σ	profenofos
0.02 0.05* 2 0.02* 0.05* 2 0.001 2 0.00 0.05* 2 0.00 0.05* 0.05* 0.00 0.03 0.03* 0.03*	0.05*				0.1*				one	procymidone
0.02 0.05* 2 0.02* 0.05* 2 0.001 2 0.00 0.05* 0.05* 0.05* 0.05* 0.03 0.05*	0.1*				0.1*					prochoraz
0.02 0.05* 0.3 0.05* 0.02* 2 0.001 2 0.05* 2	default				0.03				ole	probenazole
0.02 0.05* 0.3 0.05* 0.02* 2 0.001 2	0.05*				0.05*				s-methyl	pirimiphos-methyl
0.02 0.05* 0.3 0.05* 0.02* 0.001	0.05				0.5					pirimicarb
0.02 0.05* 0.3 0.05* 2	default				0.001					pindone
0.02 0.05* 2	0.02*				0.02*					phoxim
0.05*	0.05*		2	0.05*	0.3	2				phorate
	0.05*			0.05*	0.02				ırin	d-phenothrin

triflumuron	triflumizole	trifloxystrobin	tridemorph	tricyclazole	triclopyr	triazolyl alanine	triadimenol	triadimefon	tolylfluanid	thiometon	thiodicarb	thiamethoxam	thiacloprid	thiabendazole	tetradifon	terbufos	tepraloxydim	teflubenzuron	tecnazene	tebuthiuron	tebufenpyrad	tebufenoxide	tebuconazole	Tau-fluvalinate	sulphur	sulfentrazone	Ollovallillo
	0.1 (default)											0.1															
		40 (proposed)							50			0.09 (proposed)											40				
	50	40							50														35		exempt		JUC
0.02*	∞	40	0.1*	0.02*	0.03*		5	10	50	0.2	œ	0.1		0.1*	60	0.005*	0.05*	0.02*	0.1*	0.02*			40	10		0.05	00
	0.1*	40										0.1											40				o
	50	11							30 Import tolerance			0.1											35				
	30	40										0.09											40				
0.05*	0.1*	40	0.05*	0.05*	0.1*	default	15		*	default	10	0.09	0.1	0.1*	0.05*	0.01*	0.1*	0.05*	0.1*	default	0.5	0.1	40	10	exempt	default	0.00

Z eta-cypermethrin	Warfarin	vinclozolin	Vamidothion	triforine	trifluralin
					0.1 (default)
					0.05
20	0.001	40		30	0.05
30					0.1*
					0.05
30	default	0.05*	default	0.05*	0.05*