

BBPA Technical Circular No. 478

July 2018

Use of Pesticides on Hops for brewing

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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	Type	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	Type	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	Insecticide	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
MCPA	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 Approvals for pesticides on outdoor hops

Active	Product Name (not exhaustive)	Acceptability for brewing	Latest UK expiry date	Comments	EU/UK MRL as of March 2018
<p>Key: * value at limit of detection</p> <p>**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.</p>					
<p>Fungicides</p>					
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	UK authorisation under Minor Uses Authorisation**	10
Cymoxanil	Option	Accepted on the basis of brewing trials at Campden BRI	28/02/2022	UK authorisation under Minor Uses Authorisation**	0.1
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**	15
Myclobutanil	Systhane 20 EW	Not tested	31/10/2018	UK authorisation under Minor Uses Authorisation**	5
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

Quinoxifen	Fortress	Accepted for barley on the basis of trials at TNO. Not tested with hops.	31/10/2019	UK authorisation under Minor Uses Authorisation**	2
Sulphur	Kumulus DF	Accepted for use before burr stage only on the basis of brewing trials at Campden BRI	31/12/2021		no MRL required
Insecticides and Acaricides					
Abamectin	Dynamec	Not tested	31/05/2019	UK authorisation under Minor Uses Authorisation**	0.1
Acequinocyl	Kanemite	Not tested	30/09/2018	UK authorisation under Minor Uses Authorisation**	15
Bacillus thuringiensis	Lepinox Plus	Not tested	30/10/2021		0.01*
Chlorantranilprole	Coragen	Not tested	31/12/2020	UK authorisation under Minor Uses Authorisation**	10
Flonicamid	Mainman	Not tested	28/02/2023	UK authorisation under Minor Uses Authorisation**	3
Lambda-cyhalothrin	Hallmark	Accepted on the basis of brewing trials at Campden BRI	31/12/2018	UK authorisation under Minor Uses Authorisation**	10
Pymetrozine	Plenum W/G	Accepted on the basis of brewing trials at Campden BRI	31/12/2020	UK authorisation under Minor Uses Authorisation**	15
Pyrethrins	various	Accepted on the basis of brewing trials at Campden BRI with several synthetic pyrethroids for both barley and hops.	31/12/2021	General acceptance for all edible crops. Pyrethrins are natural products and allowed for organic crops.	0.5
Spirodiclofen	Envidor	Not tested	31/05/2019	UK authorisation under Minor Uses Authorisation**	40
Spirotetramat	Movento	Not tested	30/04/2019	UK authorisation under Minor Uses Authorisation**	15
Tebufenpyrad	Masai	Accepted on the basis of brewing trials at Campden BRI	30/06/2019		1.5
Herbicides					
Carfentrazone-ethyl	Shark, Spotlight	Accepted on the basis of evaluation at Campden BRI	31/01/2021	General acceptance for all edible crops	0.02*

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*
Miscellaneous					
Aluminium ammonium sulphate	various	Not tested	31/12/2021	Animal repellent, approved for all edible crops	default (0.01*)
Metaldelyde	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*

ANNEX 2. Hops grown in the EU outside of the UK

Chemical Active Ingredient	Activity	Germany 2018	Czech Rep. 2018	Slovenia 2018	Poland 2018	France 2018	Spain 2018	Belgium 2018	UK 2018	EU MRL (ppm)	BBPA: Acceptability for Brewing.
Abamectin	Acaricide	na	Vertimec	Vertimec Pro	na	Vertimec	na	na	Dynamec	0.1	Not tested
Acequinocyl	Acaricide	Kanemite	Kanemite 15 SC	Kanemite SC	Kanemite 150 SC	na	na	Kanemite	Kanemite	15	Not tested
Acetamiprid	Aphicide	na	Mospilan 20 SP	na	na	na	na	na	na	0.05*	Not tested
Ametoctradin	Fungicide	Orvego	Orvego	na	na	na	na	na	Percos	100	Not tested
Azadirachtin	Insecticide	Lizetan AZ	na	na	na	na	na	na	na	0.01	Not tested
Azoxystrobin	Fungicide	Ortiva	Ortiva	Ortiva	na	na	na	na	na	30	Accepted on the basis of brewing trials on barley, 1997
Bacillus thuringiensis	Insecticide	na	Lepinox Plus	Lepinox Plus	Lepinox Plus	Lepinox Plus	na	na	Lepinox Plus	0.01*	Not tested
Bifenazate	Acaricide	na	Acramite 480 SC	na	na	na	na	na	na	20	Not tested
Boscalid	Fungicide	Bellis	Bellis	na	na	na	na	Bellis	Bellis	80	Accepted on the basis of brewing trials on barley, 2004
Bupirimate	Fungicide	na	na	na	na	na	Nimrod, Quatro	na	Nimrod	10	Accepted on the basis of brewing trials at Campden BRI
Carfentrazone-ethyl	Herbicide	na	na	na	na	Spotlight Plus	na	na	Spotlight #	0.02*	Accepted on the basis of evaluation at Campden BRI
Chlorantranilprole	Insecticide	na	na	na	na	na	na	na	Coragen	10	Not tested
Copper	Fungicide	Funguran	various	various	various	various	various	various	na	1000	Accepted on the basis of brewing trials at Campden BRI using metalaxyl-copper mixture
Cymoxanil	Fungicide	Aktuan	Curzate K	na	Curzate Cu 49.5 WP	na	na	na	Option	0.1	Accepted on the basis of brewing trials at Campden BRI
Dimethomorph	Fungicide	Forum	Orvego	na	na	na	na	na	Percos	80	Not tested

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

Metaxyl-m / Mefenoxam	Fungicide	na	Ridomil Gold Combi Peptide	Fonganiil Gold	na	Subdue Gold	na	na	na	SL567A	15	Accepted on the basis of brewing trials at Campden BRI
Metaldelhyde	Molluscicide	na	na	na	na	na	na	na	na	Metarex #	0.1*	Accepted on the basis of application type and established use prior to 1980 with no problems.
Metram	Fungicide	Polyram WG	na	na	na	na	na	Polyram	na	na	25	Not tested
Metrafenone	Fungicide	Vivando	na	Vivando	na	na	na	Flexity	na	na	80	Not tested
Milbemectin	Acaricide	Milbeknock	na	Milbeknock	na	na	na	na	na	na	0.2*	Not tested
Myclobutanil	Fungicide	Systhane 20 EW	na	Systhane 20 EW	na	na	na	na	na	Systhane 20 EW	5	Accepted on the basis of brewing trials at Campden BRI
Potassium bicarbonate	Fungicide	Kumar	Kumar	Vitsan	na	Potassium Bicarbonate	na	na	na	Potassium Bicarbonate	exempt	Accepted on the basis of evaluation at CampdenBRI
Propyzamide	Herbicide	na	na	na	na	na	na	na	na	Kerb Flo	0.05*	Accepted on the basis of early application and established use prior to 1980 with no problems.
Pyrimetozine	Aphicide	Plenum 50 WG	Plenum	Chess 50 WG	na	Plenum 50WG	na	Plenum	Plenum	Plenum 50WG	15	Accepted on the basis of brewing trials at Campden BRI
Pyraclostrobin	Fungicide	Bellis	Bellis	na	na	na	na	Bellis (+boscalid)	Bellis (+boscalid)	na	15	Accepted for barley. Not tested for hops.
Pyraflufen-ethyl	Herbicide	Quickdown	na	na	na	na	na	na	na	Quickdown	0.1*	Not tested
Quinoxifen	Fungicide	Fortress 250	IQ-Crystal	na	na	na	na	Fortress	Fortress	Fortress	2	Accepted for barley on the basis of trials at TNO. Not tested with hops.
Sheep fat	Repellent	Trico	Trico	Trico	na	na	na	Trico	na	na	exempt	Not tested
Spirodiclofen	Acaricide	Envidor	na	na	na	na	na	Envidor	na	Envidor	40	Not tested
Spirotetramat	Aphicide	na	Movento 150 OD	Movento SC 100	na	na	na	Movento 100SC	Movento	Movento	15	Not tested
Sulphur	Fungicide	Kumulus WG	Kumulus WG	Kumulus DF	Starkol 80 WG	various	Sulfur	various	various	various	exempt	Accepted for use before burr stage only on the basis of brewing trials at CampdenBRI
tau-Fluvalinate	Insecticide	na	na	na	na	Klartan	na	na	na	na	10	Not tested
Tebufenpyrad	Acaricide	na	na	na	na	na	na	Masai 20 WP	Masai	Masai	1.5	Accepted on the basis of brewing trials at Campden BRI
Thiamethoxam †	Insecticide	Actara	Actara 25 WG	na	na	na	na	na	na	na	0.05	Not tested

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

† 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.

Annex 3: Non-EU Registration and MRLs for pesticides used on HOPS

Notes: * = limit of detection: MRLs above the limit of detection are in bold

COLOUR CODE									
MRL HIGHER than EU									
MRL same as or close to EU									
MRL LOWER than EU									
Approved in at least one EU country									
	<p style="text-align: center;">KEY</p> <p style="text-align: center;">T = temporary</p> <p style="text-align: center;">E = extraneous (ie no current registration)</p> <p style="text-align: center;">Default value is residue allowed if no MRL is set</p> <p style="text-align: center;">Values in BOLD are higher than the detection limit</p> <p style="text-align: center;">* = value set at the limit of determination</p>								
Chemical	Australia	Canada	China	Hong Kong	Japan	South Africa	US	WHO	EU
Data Source	APVMA	Health Canada	US FAS Online database	LN 73 of 2012	Japan Food Chemical Research Foundation	US FAS Online database	US FAS Online database	Codex database	EU MRL Database
Issue or date accessed	As of March 2018	As of March 2018	As of March 2018	As of March 2018	as of March 2018	As of March 2017, source, US FAS Online database. RSA follows either EU or Codex MRLs	FAS Online database, as of March 2018	As of March 2018	As of March 2018
Abamectin	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.15	0.1
Acequinocyl				4	15	15	15		15
Accephate						0.05	0.02		0.05
Acetamiprid						0.05			0.05
Aldicarb									0.05*
aldrin + dieldrin					0.06				0.02*
alpha-cypermethrin					20				30
aluminium sulphate									default

In the EU, MRLs are set for ALL crop/chemical combinations even if the chemical is not used on that crop. MRLs shown here are for chemicals known to have MRLs for hops in at least 1 other country. (Except for ubiquitous environmental contaminants such as DDT). NL = no limit needed. Default =0.01mg/kg

carbosulfan																		0.05*
carfentrazone ethyl	0.05*	0.1			0.1	1	0.3	0.02*	0.1									0.02*
cartap						10	10											default
chlorantraniliprole	0.01*	40	40 (proposed)	90	90	90	0.02*	40	40									10
chlorbenside																		0.1*
chlorbufam																		0.1*
chlordane						0.02												0.02*
chlorfenapyr							0.05											0.05*
chlorfenson																		0.1*
chlorfluazuron						0.05												default
chlormequat						0.1*												0.1*
chlorobenzilate						0.1*												0.1*
chlorothalonil						0.1												60
chloroxuron																		0.1*
chlorpyrifos						0.1*		0.1*										0.1*
chlorpyrifos-methyl						0.1*												0.1*
chlzolinate																		0.1*
cindon-ethyl																		0.1*
clethodim						0.1		0.1	0.5									0.1
clodinafop-propargyl						0.02												0.05*
clofentazine	0.2*					0.2												0.05*
clomazone						0.02*												0.05
clopyralid	2	5		5	5	5	5	5	5									5
clothianidin						0.1												0.05*
copper (from copper salts)						see individual salts												1000
copper nonylphenolsulfonate						0.04												default
copper tetrathalate																		default
4-CPA (chlorophenoxyacetic acid)						0.02												default
cyanamide																		0.2
cyazofamid			10			10	10	0.02*	10	15								20

fenoxycarb						0.05*					0.05*
fenpropathrin						0.5					0.02*
fenpropiimorph						0.1					0.05*
fenpyroximate		10	10 (proposed)	10	15	10	10	10	10	15	15
fentin					0.5					0.1*	0.1*
fenvalerate					5					0.05*	0.05*
ferric phosphate				exempt						NL	
fipronil					0.002*					0.01*	0.01*
flazasulfuron					0.02*					0.02*	0.02*
flonicamid		7		7	5	2	20	20	3	3	0.05*
fluzitop-P butyl	0.05				0.05					0.05*	0.05*
flucythrinate					10					0.1*	0.1*
flumioxazin				0.05	0.05	0.1*	0.05			0.1*	0.1*
fluometuron					0.02*					0.02*	0.02*
fluopicolide							30			0.7	0.7
Fluopyram		60			60		60			3	3
fluoride ion										10	10
fluoroinide					0.04					default	default
flupyradifurone		10			10		10			4	4
fluridone										default	default
fluroxypyr					0.1*					0.1*	0.1*
flutriafol							20			0.05*	0.05*
fluvalinate					10					see tau-fluvalinate (10)	see tau-fluvalinate (10)
folpet				120	120	150	120			400	400
formothion										0.05*	0.05*
fosetyl aluminium				45	1440	1500	45			1500	1500
furathiocarb					5					0.05*	0.05*
furfural										1	1
Gibberellic acid										None	None
glufosinate ammonium	1 (TT)				0.2					0.1*	0.1*
glyphosate	0.1*			7	0.1	0.1*	7			0.1*	0.1*

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

d-phenothrin					0.02	0.05*				0.05*
phorate				2	0.3	0.05*		2		0.05*
phoxim					0.02*					0.02*
pinidone					0.001					default
pirimicarb					0.5					0.05
pirimiphos-methyl					0.05*					0.05*
probenazole					0.03					default
prochloraz					0.1*					0.1*
procymidone					0.1*					0.05*
profenofos					0.1*					0.05*
prohexadione calcium					0.1*					0.1*
propargite	3	30		100	100	100	100	100	100	0.05*
propiconazole					0.1*					0.1*
propineb					30					25
propoxur					0.1*					0.1*
propyzamide										0.05*
pymetrozine		6		6	15	15		6		15
pyraclostrobin		23	15 (proposed)	15	15	15		23	15	15
pyraflufen-ethyl					0.05					0.1*
pyrazolynate					0.02*					default
pyrazophos					0.1*					0.1*
pyrethrins					0.05	0.5				0.5
pyridaben				10	10	10		10		10
pyriproxyfen						0.05*				0.05*
Quinalfos					0.1*					0.1*
quinoxifen		2.5	1	1	1	1		3	1	2
quintozene					0.05					0.1*
Resmethrin					0.2	0.2*				0.2*
Spinetorum						0.1*		22		0.1*
spinosad				22		22		22		0.1*
spiromeclofen		40	40 (proposed)	40	40	40		30	40	40

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