Biocidal Products Committee (BPC)

Opinion on the application for approval of the active substance:

Cyphenothrin

Product type: 18

ECHA/BPC/183/2017

Adopted

14 December 2017

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Opinion of the Biocidal Products Committee

on the application for approval of the active substance Cyphenothrin for product type 18

In accordance with Article 89(1) of Regulation (EU) No 528/2012 of the European Parliament and of the Council 22 May 2012 concerning the making available on the market and use of biocidal products (BPR), the Biocidal Products Committee (BPC) has adopted this opinion on the approval in product type 18 of the following active substance:

Common name:	**Cyphenothrin**
Chemical name(s):	(RS)-α-cyano-3-phenoxybenzyl (1RS,3RS;1RS,3SR)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate
EC No.:	254-484-5
CAS No.:	39515-40-7
Existing active substance	

This document presents the opinion adopted by the BPC, having regard to the conclusions of the evaluating Competent Authority. The assessment report, as a supporting document to the opinion, contains the detailed grounds for the opinion.

Process for the adoption of BPC opinions

Following the submission of an application by Sumitomo Chemical (U.K.) PLC in 2006, the evaluating Competent Authority Greece (EL) submitted an assessment report and the conclusions of its evaluation to the Commission on 11 April 2013. In order to review the assessment report and the conclusions of the evaluating Competent Authority, the Agency organised consultations *via* the BPC (BPC-23) and its Working Groups WG-II-2017 and WG-III-2017). Revisions agreed upon were presented and the assessment report and the conclusions were amended accordingly.

Information on the fulfilment of the conditions for considering the active substance as a candidate for substitution was made publicly available on the ECHA website https://echa.europa.eu/potential-candidates-for-substitution-previous-consultations on 21 April 2017, in accordance with the requirements of Article 10(3) of Regulation (EU) No 528/2012. Interested third parties were invited to submit relevant information by 20 June 2017.

Adoption of the BPC opinion

Rapporteur: Greece

The BPC opinion on the approval of the active substance cyphenothrin in product type 18 was adopted on 14 December 2017.

The BPC opinion takes into account the comments of interested third parties provided in accordance with Article 10(3) of BPR.

The BPC opinion was adopted by consensus. The opinion is published on the ECHA webpage at:

http://echa.europa.eu/regulations/biocidal-products-regulation/approval-of-active-substances/bpc-opinions-on-active-substance-approval.

Detailed BPC opinion and background

1. Overall conclusion

The overall conclusion of the BPC is that the Cyphenothrin in product type 18 may be approved. The detailed grounds for the overall conclusion are described in the assessment report.

2. BPC Opinion

2.1. BPC Conclusions of the evaluation

a) Presentation of the active substance including the classification and labelling of the active substance

This evaluation covers the use of cyphenothrin in product type 18. Cyphenothrin is a synthetic pyrethroid insecticide with knockdown and killing action against cockroaches, ants, fleas and bedbugs. Specifications for the reference source are established.

Cyphenothrin a racemic mixture of 4 pairs of diastereoisomers (8 isomers). The minimum purity of cyphenothrin is 92% w/w (total isomers).

The physico-chemical properties of the active substance and biocidal product have been evaluated and are deemed acceptable for the appropriate use, storage and transportation of the active substance and biocidal product.

Validated analytical methods are available for the active substance as manufactured and for the impurities. Validated analytical methods are available for air. No analytical methods for food and feed of animal origin are required.

No harmonised classification for cyphenothrin is available. The CLH dossier is currently in preparation and will be submitted to ECHA as soon as possible.

The eCA proposal for classification and labelling for cyphenothrin according to Regulation (EC) No 1272/2008 (CLP Regulation) is:

(Proposed) Classification according to the CLP Regulation	
Hazard Class and Category Codes	Acute Tox 4 Acute Tox 4 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1
Labelling	
Pictogram codes	GS07 GS08 GS09
Signal Word	Danger
Hazard Statement Codes	H302: Harmful if swallowed H332: Harmful if inhaled. H372: Causes damage to respiratory system through prolonged or repeated exposure by inhalation H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long lasting effects
Specific Concentration	Acute M-factor: 1000

limits, M-Factors	Chronic M-factor: 1000
Justification for the proposal	
-	

b) Intended use, target species and effectiveness

Cyphenothrin is intended to be used in domestic premises indoors by professionals as direct spray against German cockroaches and ants, surface residual spray (including crack and crevice treatment) against German and American cockroaches, and surface spot, crack and crevice treatment against German cockroaches, bed bugs and cat fleas.

Cyphenothrin is a synthetic pyrethroid insecticide with contact and stomach action. It affects the nervous system of insects causing pronounced repetitive activity and a prolongation of the transient increase in sodium permeability of nerve membranes in insects and other invertebrates. This results in continual nerve impulse transmission leading to tremors and death. This is demonstrated by the rapid knockdown action that pyrethroid compounds, e.g. cyphenothrin, have against target insects.

In order to support inclusion of cyphenothrin in Union List, the applicant submitted efficacy studies with two representative products, one with 5% w/v cyphenothrin and an oil-based-aerosol with 0.3% w/w cyphenothrin + 0.1% w/w imiprothrin. The applicant submitted also an efficacy lab study with the oil-based product containing only cyphenothrin as active substance at 0.3% (without imiprothrin) by increasing the content of one solvent in order to replace imiprothrin.

Based on the results of efficacy studies, cyphenothrin proved to be effective indoors as knockdown and killing agent by direct spray against German cockroaches and killing agent by surface residual spray (including crack and crevice treatment) against German and American cockroaches at 0.0625 g a.i./m^2, as well as knockdown and killing agent by direct spray against black garden ants at 0.05 g a.i./m^2. Cyphenothrin was also effective indoors as knockdown and killing agent as a spot, crack and crevice treatment on its own and in combination with another insecticide at 0.0198 g a.i./m^2 against German cockroaches (*Blattella germanica*), bed bugs (*Cimex lectularius*) and cat fleas (*Ctenocephalides felis*).

Some resistance cases of cyphenothrin have been reported against houseflies (*Musca domestica*) and whiteflies (*Bemisia tabaci*). Strategies such as alternation with insecticides with different modes of action and avoidance of over frequent use are standard practises in agriculture and should be applied also to biocide uses of cyphenothrin.

c) Overall conclusion of the evaluation including need for risk management measures

Human health

Cyphenothrin is rapidly absorbed after single oral administration; it is extensively metabolised and efficiently excreted via urine and faeces. There is no potential for accumulation in the body. Cyphenothrin is harmful by the oral and inhalation routes and classification as Acute Tox 4 with H302 (harmful if swallowed) and H332 (harmful if inhaled) is proposed. It is of low acute dermal toxicity and it is not irritating to the rabbit skin while it is slightly irritating to the rabbit eye. It does not show potential for skin sensitisation. Cyphenothrin is not considered to be immunotoxic, carcinogenic, genotoxic or toxic to reproduction. The most critical effect of cyphenothrin after single or repeated oral administration is Type I pyrethroid toxicity. It causes adverse effects after repeated exposure *via* the inhalation route and classification as STOT RE with H372 (causes damage to respiratory system through prolonged or repeated exposure by inhalation) is proposed.

The table below summarises the exposure scenarios assessed:

Summary table: human health scenarios			
Scenario	**Primary or secondary exposure and description of scenario**	**Exposed group**	**Conclusion**
Indoor spot, crack and crevice treatment using hand held ready-to-use aerosol sprayer	**Primary** exposure during indoor surface spot, crack and crevice application of cyphenothrin	Professionals	**Acceptable** with the use of PPE (gloves and impermeable coverall)
	Secondary exposure of adult, child or toddler touching treated area and inhaling cyphenothrin in atmosphere and hand-to-mouth exposure of a toddler	Bystanders (adult, child, toddler)	**Acceptable** (adult, child) Unacceptable (toddler)
	Combined exposure where the user of product is also a resident	Professionals - adult	**Acceptable**
Indoor general surface treatment using low pressure handheld spray equipment with hydraulic nozzles	**Primary** exposure during mixing/loading and application and cleaning of the spraying equipment	Professionals	**Not acceptable** even with the use of PPE (gloves and impermeable coverall) and RPE (FFp2 half mask)
	Secondary exposure of adult, child, toddler or infant touching treated area and inhaling cyphenothrin in atmosphere and hand-to-mouth exposure of infant and toddler	Bystanders (adult, child, toddler, infant)	**Not acceptable**
	Combined exposure where the user of product is also a resident	Professionals - adult	**Not acceptable**

Professional use of cyphenothrin products for indoor surface spot, crack and crevice treatment is considered to be safe when PPE (gloves and impermeable coverall) is used. The risks are considered acceptable for bystanders (adults and children) following indoor application. It is noted that for toddlers, a risk is identified. Nevertheless, given that the intended use is for spot, crack and crevice treatment and as such, toddlers will not have immediate access to treated residues, no particular concern is raised. In addition, exposure levels might be considered as an overestimation, since the conservative default value of 75% for dermal absorption was used in the calculations, in the absence of dermal absorption data relevant to the product. However, as a precautionary measure, a label instruction for cyphenothrin products should indicate to be applied only to areas inaccessible to children. Combined systemic exposure from application by professional users, residents in the treated building, presents an acceptable risk. Since the representative biocidal product with 0.3% w/w cyphenothrin + 0.1% w/w imiprothrin is classified as skin sensitiser (Skin Sens 1 – H317) and assigned with the phrase EUH066 a local risk assessment was performed. An acceptable risk is identified for local effects as the use of gloves and impermeable coverall is considered to adequately protect the professional users. A dietary risk assessment was not undertaken due to the use pattern. Possible food contamination can be avoided by label restrictions.

For professional use of cyphenothrin products for indoor general surface treatment using low pressure handheld spray equipment, an unacceptable risk has been identified for primary, secondary and combined exposure scenarios. Since the representative product with 5% w/v cyphenothrin is classified as skin irritant (Skin Irrit 2 – H315) and as STOT RE 2 with H373 for local effects to the respiratory system, a local risk assessment was performed. No risk has been identified for local effects. A dietary risk assessment was not undertaken due to the use pattern. Possible food contamination can be avoided by label restrictions.

Environment

The table below summarises the exposure scenarios assessed.

Summary table: environment scenarios		
Scenario	**Description of scenario including environmental compartments**	**Conclusion**
Indoor general surface treatment by professionals using low pressure handheld spray equipment with hydraulic nozzles	Indoor use considering total area spraying (including spot application in cracks and crevices). Sewage Treatment Plant (STP) is expected to be directly exposed while soil, groundwater, surface and sediment are considered to be secondary exposed	<u>General surface area treatment:</u> **Unacceptable risks** to STP, surface water, sediment, soil, earthworm- and fish- eating mammals due to secondary poisoning and groundwater have been identified
Indoor general surface treatment by professionals using low pressure handheld spray equipment with hydraulic nozzles up 1 or 2 applications per year		<u>General surface area treatment:</u> **Unacceptable risk** has been identified for surface water, sediment, soil and groundwater. **Acceptable risk** for STP and secondary poisoning (earthworm-eating and fish-eating mammals) has been demonstrated
Indoor spraying applications in cracks and crevices by professionals using hand held aerosol sprayer, considering 1 or 2 applications per year and an application rate of 0.1 g cyphenothrin/m^2		<u>Application in cracks and crevices:</u> **Unacceptable risk** for sediment has been identified. **Acceptable risk** for STP, surface water, soil, groundwater and secondary poisoning (earthworm-eating and fish-eating mammals) has been demonstrated

Indoor spraying applications in cracks and crevices by professionals using hand held ready-to-use aerosol sprayer, considering its applied once per month at an application rate of 0.02 g cyphenothrin/m^2		Application in cracks and crevices: **Acceptable risks** for all relevant compartments have been identified

The proposed application rates, 0.0625 g a.i./m^2 and 0.0198 g a.i./m^2, have been rounded to 0.1 g a.i./m^2 and 0.02 g a.i./m^2 respectively, in order to assess a worse-case scenario. These rounded applications rates have been used in the assessments.

Cyphenothrin:

Aquatic compartment (including STP, surface water and sediment)

The risk to STP microorganisms was acceptable following the intended indoor uses for application on total surface area (for 1-2 applications/year) and application on cracks and crevices, for both products (low pressure handheld spray equipment and ready-to-use). Regarding surface water an acceptable risk has been identified for application on crack and crevices. For sediment-dwelling organisms an acceptable risk is considered only for applications on cracks and crevices with the lower application rate of 0.02 g cyphenothrin/m^2.

Terrestrial compartment (including soil, groundwater, fish- and earthworm eating predators, bees and other non-target arthropods)

The risk to soil organisms was acceptable for the application on cracks and crevices for both products (low pressure handheld spray equipment and ready-to-use). Regarding groundwater, the calculated PEC values were below 0.1 µg/L, and therefore the trigger value for groundwater in all scenarios is not exceeded. The risks to fish- and earthworm-eating predators were acceptable following the intended indoor uses for application on total surface area (for 1-2 applications/year) and application on cracks and crevices, for both products. Taking into account the intended uses of formulated cyphenothrin in PT18 indoor applications, no exposure of bees and other non-target arthropods is expected and the associated risk was considered as acceptable.

Major metabolites of cyphenothrin:

For the application in cracks and crevices by professionals using hand held ready-to-use aerosol sprayer once per month at an application rate of 0.02 g cyphenothrin/m^2 the risk was acceptable for all metabolites in all compartments.

Overall, an acceptable risk is identified only for all environmental compartments for indoor spraying applications in cracks and crevices when considering one application per month at an application rate of 0.02 g cyphenothrin/m^2.

Overall conclusion

In human health risk assessment and in case of indoor surface spot, crack and crevice treatment with a ready-to-use aerosol sprayer, the relevant scenarios have been assessed and have been considered acceptable for professionals with the use of appropriate personal protective equipment.

Regarding indoor general surface treatment using low pressure handheld spray equipment the relevant scenarios have been assessed and have been considered unacceptable for professionals even with the use of personal protective equipment.

Regarding environmental risk assessment acceptable risk is identified for indoor spraying on cracks and crevices considering hand held ready-to-use aerosol sprayer with an application once per month and at a dose of 0.02 g cyphenothrin/m^2.

Overall a safe use is demonstrated for human health and the environment for spraying of cracks and crevices indoors using hand held aerosols with an application once per month and at a dose of 0.02 g cyphenothrin/m^2 if appropriate risk mitigation measures are applied.

2.2. Exclusion, substitution and POP criteria

2.2.1. Exclusion and substitution criteria

The table below summarises the relevant information with respect to the assessment of exclusion and substitution criteria:

<table>
<tr><th colspan="2">Property</th><th>Conclusions</th><th></th></tr>
<tr><td rowspan="3">CMR properties</td><td>Carcinogenicity (C)</td><td>no classification required</td><td rowspan="3">Cyphenothrin does not fulfil criterion (a), (b) or (c) of Article 5(1)</td></tr>
<tr><td>Mutagenicity (M)</td><td>no classification required</td></tr>
<tr><td>Toxic for reproduction (R)</td><td>no classification required</td></tr>
<tr><td rowspan="3">PBT and vPvB properties</td><td>Persistent (P) or very Persistent (vP)</td><td>P</td><td rowspan="3">Cyphenothrin does not fulfil criterion (e) of Article 5(1), fulfils criterion (d) of Article 10(1)</td></tr>
<tr><td>Bioaccumulative (B) or very Bioaccumulative (vB)</td><td>Not B</td></tr>
<tr><td>Toxic (T)</td><td>T</td></tr>
<tr><td>Endocrine disrupting properties</td><td colspan="3">Cyphenothrin is not considered to have endocrine disrupting properties. Cyphenothrin does not fulfil criterion (d) of Article 5(1)</td></tr>
<tr><td>Respiratory sensitisation properties</td><td colspan="3">No classification required. Cyphenothrin does not fulfil criterion (b) of Article 10(1)</td></tr>
<tr><td>Concerns linked to critical effects</td><td colspan="3">Cyphenothrin does not fulfil criterion (e) of Article 10(1)</td></tr>
</table>

Proportion of non-active isomers or impurities	All isomers are considered part of the active substance. Cyphenothrin does not fulfil criterion (e) of Article 10(1).

The PBT assessment for cyphenothrin's major metabolites is summarized in the following table.

Substance	PBT properties		
	Persistence (P)	Bioaccumulation (B)	Toxicity (T)
4'OH-*c*-S-2703	not P, not vP	not B, not vB	T
nitro derivative of 4'-OH-*c*-S-2703	P	not B, not vB	T
d-*t*-CRA	not P, not vP	not B, not vB	not T
d-*c*-CRA	P		
ωt-COOH-*d*-*c*-CRA	not P, not vP	not B, not vB	not T
t-COOH-CA	vP	not B, not vB	not T
c-COOH-CA	not P, not vP		
PBacid	not P, not vP	not B, not vB	not T

Metabolite NO_2-4'-OH-c-S-2703 fulfils the P and T criteria. Furthermore, metabolites d-c-CRA and t-COOH-CA are characterised as P and vP respectively.

Consequently, the following is concluded:

Cyphenothrin does not meet the exclusion criteria laid down in Article 5 of Regulation (EU) No 528/2012.

Cyphenothrin meets the conditions laid down in Article 10(1)(d) of Regulation (EU) No 528/2012, and is therefore considered as a candidate for substitution. The exclusion and substitution criteria were assessed in line with the "Note on the principles for taking decisions on the approval of active substances under the BPR"[1] and in line with "Further guidance on the application of the substitution criteria set out under article 10(1) of the BPR"[2] agreed at the 54th and 58th meeting respectively, of the representatives of Member States Competent Authorities for the implementation of Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products. This implies that the assessment of the exclusion criteria is based on Article 5(1) and the assessment of substitution criteria is based on Article 10(1)(a, b, d, e and f).

2.2.2. POP criteria

Cyphenothrin is considered persistent and does not demonstrate the potential of long-range transport based on an estimated atmospheric half-life of < 4 h, assuming a 12 h day and an OH radical concentration of 7 x 10^{11} mol OH^-/ cm^3. This conclusion is further supported by the compound's very low vapour pressure (2.9 x 10^{-7} Pa at 25^0C), low predicted Henry's Law constant plus limited environmental exposure from use patterns.

However, the available (eco)toxicological data do not indicate a concern to human health, animals and the environment. Therefore, cyphenothrin does not meet the POP criteria.

[1] See document: Note on the principles for taking decisions on the approval of active substances under the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/c41b4ad4-356c-4852-9512-62e72cc919df/CA-March14-Doc.4.1%20-%20Final%20-%20Principles%20for%20substance%20approval.doc)

[2] See document: Further guidance on the application of the substitution criteria set out under article 10(1) of the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/dbac71e3-cd70-4ed7-bd40-fc1cb92cfe1c/CA-Nov14-Doc.4.4%20-%20Final%20-%20Further%20guidance%20on%20Art10(1).doc)

2.2.3. Public consultation for potential candidates for substitution and alternative substances or technologies

As cyphenothrin is considered a candidate for substitution, ECHA launched the public consultation in accordance with Article 10(3) of Regulation (EU) No 528/2012. The public consultation took place from 21/04/2017 to 20/06/2017. One (confidential) contribution was submitted by the applicant related to the assessment of persistency for cyphenothrin itself.

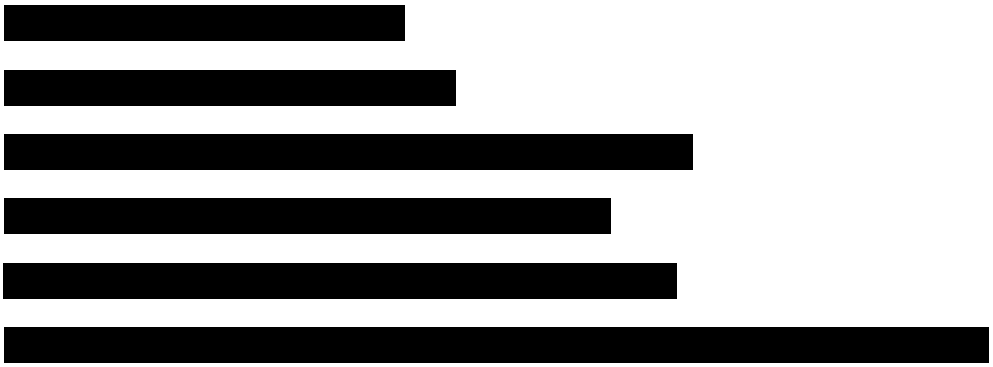
Many other active substances with similar or the same intended uses under PT 18 were approved and included in the Union list of approved active substances, for example alpha-cypermethrin, cypermethrin, cyfluthrin, dinotefuran, *epsilon*-momfluorothrin, imiprothrin and permethrin.

2.3. BPC opinion on the application for approval of the active substance Cyphenothrin in product type PT18

In view of the conclusions of the evaluation, it is proposed that cyphenothrin shall be approved and be included in the Union list of approved active substances, subject to the following specific conditions:

1. Specification: minimum purity of the active substance evaluated: 92 % w/w (total isomers).

2. Relevant impurities[3]:



3. The authorisations of biocidal products are subject to the following condition(s):

   a. The product assessment shall pay particular attention to the exposures, the risks and the efficacy linked to any uses covered by an application for authorisation, but not addressed in the Union level risk assessment of the active substance.

   b. In view of the risks identified for the uses assessed, the product assessment shall pay particular attention to:

      i. Professional users;

      ii. Toddlers;

      iii. Surface water, sediment, soil and groundwater, following indoor surface treatment;

      iv. Earthworm- and fish-eating mammals due to secondary poisoning, following indoor surface treatment.

[3] Disclaimer ECHA 6 July 2018: the information provided here is 'blackened out' pending the assessment of a confidentiality claim.

c. For products that may lead to residues in food or feed, the need to set new or to amend existing maximum residue levels (MRLs) in accordance with Regulation (EC) No 470/2009[4] or Regulation (EC) No 396/2005[5] shall be verified, and any appropriate risk mitigation measures shall be taken to ensure that the applicable MRLs are not exceeded.

d. Cyphenothrin is considered a candidate for substitution in accordance with Article 10(1)(d) of Regulation (EU) No 528/2012.

As cyphenothrin is proposed to be classified as Acute Tox 4, STOT RE 1, Aquatic Chronic 1 and Aquatic Acute 1 and is persistent (P) in the environment and therefore gives rise to concern according to Article 28(2) being of an equivalent level of concern it can not be included in Annex I of Regulation (EU) 528/2012.

2.4. Elements to be taken into account when authorising products

1. The active substance cyphenothrin is considered as a candidate for substitution, and consequently the competent authority shall perform a comparative assessment as part of the evaluation of an application for either national or Union authorisation.

2. The following recommendations and risk mitigation measures have been identified for the uses assessed. Authorities should consider these risk mitigation measures when authorising products, together with possible other risk mitigation measures, and decide whether these measures are applicable for the concerned product:

   a. An unacceptable risk is identified for STP, surface water, sediment, soil, groundwater and earthworm- and fish-eating mammals due to secondary poisoning for products used indoors as a spray for total surface treatment. If the risk cannot be reduced to an acceptable level by appropriate risk mitigation measures or by other means, these uses should not be authorised.

   b. If an unacceptable risk is identified for professional users, safe operational procedures and appropriate organizational measures shall be established. Products shall be used with appropriate personal protective equipment where exposure cannot be reduced to an acceptable level by other means.

   c. An unacceptable risk for professional users is identified for products applied to surfaces by low pressure handheld spraying. If the risk cannot be reduced to an acceptable level by appropriate risk mitigation measures, these uses should not be authorised.

   d. Unprotected persons and animals should be kept away from treated areas until surfaces are dry.

   e. An unacceptable risk for toddlers is identified following secondary exposure to treated surfaces. If the risk cannot be reduced to an acceptable level by appropriate risk mitigation measures, for example, restricting uses to areas not accessible to children, these uses should not be authorised.

   f. Do not contaminate foodstuffs, eating utensils or food contact surfaces.

   g. An assessment of the risk in food and feed areas may be required at product authorisation where use of the product may lead to contamination of food and feeding stuffs.

[4] Regulation (EC) No 470/2009 of the European Parliament and of the Council (OJ L 152, 16.6.2009, p. 11
[5] Regulation (EC) No 396/2005 of the European Parliament and of the Council (OJ L 70, 16.3.2005, p. 1

h. Resistance to cyphenothrin has been reported for some insect pests both in agriculture and public health. Strategies such as alternation fwith insecticides with different modes of action and avoidance of over frequent use should be applied to biocide uses of cyphenothrin.

i. To minimise excess spraying, special equipment (e.g. nozzle with straw) for application in cracks and crevices is recommended.

2.5. Requirement for further information

Sufficient data have been provided to verify the conclusions on the active substance, permitting the proposal for the approval of cyphenothrin. However, the following further data must be submitted to the evaluating Competent Authority (Greece) as soon as possible but no later than 6 months before the date of approval of the active substance:

- a fully validated analytical method for the determination of residues of cyphenothrin in soil;
- information on the clean-up of the residue analytical method of cyphenothrin in drinking water;
- a fully validated method for the determination of residues of cyphenothrin in surface water.

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