プロスルホカルブ

公表文献調査結果について

シンジェンタジャパン株式会社

1. 概要

プロスルホカルブに関して、再評価資料提出期限の始期（2022 年 7 月 1 日）の 6 ヶ月前から過去15年間を含む期間に発行された公表文献について検索し、適合性及び信頼性の評価を行った。英文の文献検索については、2004 年 10 月 7 日～2022 年 1 月 31 日に発行された公表文献を、和文の文献検索については、2007 年 1 月 1 日～2022 年 1 月 31 日に発行された公表文献を対象とした。なお、2022 年 6 月 28 日時点において、海外の評価機関が発行する評価書において引用されている公表文献はなかった。

2. 報告書の構成について

プロスルホカルブの公表文献に関する報告書及びその概要については以下の通りである。

2.1 英文文献の調査結果について

- 2004 年 10 月 7 日～2016 年 3 月 30 日の期間については EU において提出された報告書を用いる。該当フォルダ中に各分野における公表文献調査結果報告書及び適合性ありと判断された公表文献の写しを収載した。該当期間において「ヒトに対する毒性」の分野に適合性ありと判断された公表文献は確認されなかったため、食品安全委員会より提供されているフォーマットに準じた資料の作成は行っていない。なお、以下の点については申請者が追加で対応を行っている。

    - 環境動態の分野では、EU において提出した報告書において、5 文献について適合性ありと判断されたが、区分 a、b、c の分類及び信頼性評価が実施されていなかった。そのため、申請者が「公表文献の収集、選択等のためのガイドライン（令和 3 年 9 月 22 日　農薬資材審議会農薬分科会決定)」に従って追加で第 2 段階の適合性評価及び信頼性評価を行い、その結果を「文献の検索及び適合性の判断」の報告書の後に追記した。また、区分 a と判断された文献の概要も併せて追記した。

- 2016 年 3 月 1 日～2022 年 1 月 31 日の期間については、Web of Science Core Collection を用いた追加の調査を行った。結果を「農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査報告書」として報告する。該当期間において適合性ありと判断された公表文献は確認されなかったため、農林水産省及び食品安全委員会より提供されているフォーマットに準じた資料の作成は行っていない。

2.2 和文文献の調査結果について

2007 年 1 月 1 日～2022 年 1 月 31 日に発行された和文の公表文献を対象として調査を行った。結果を「農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査報告書」として報告する。該当期間において適合性ありと判断された公表文献は確認され

なかったため、農林水産省及び食品安全委員会より提供されているフォーマットに準じた資料の作成は行っていない。

2.3 海外の評価機関で引用されている公表文献について

2022年6月28日時点において、当該有効成分は米国で農薬使用が認可されておらず、JMPRによる評価も行われていない。欧州では除草剤として登録があり、2022年9月13日時点再評価中である。

参照した欧州における評価書について、「農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査報告書」に報告する。これら評価書においてリスク評価に関連する公表文献の引用は認められなかった。

3. 検索結果のまとめ

3.1 英文文献の調査結果

検索をおこなった全期間（2004 年 10 月 7 日～2022 年 1 月 31 日）の調査結果のまとめを表 3.1-1 及び表 3.1-2 に示す。

表 3.1-1 評価目的との適合性評価（第 1 段階、第 2 段階）の結果のまとめ

分野	該当する論文数	第 1 段階		第 2 段階	
		適合性なし	それ以外（第 2 段階へ）	適合性なし	適合性あり (区分 a+b+c)
ヒトに対する毒性	88 (74*+14**)	70*	18 (4*+14**)	4*	0
農作物及び畜産物への残留	156 (130*+26**)	130*	26**	1**	0
生活環境動植物及び家畜に対する毒性	83 (72*+11**)	65*	18 (7*+11**)	8 (7*+1**)	0
環境動態	216 (202*+14**)	197*	19 (5*+14**)	14 (2*+12**)	3*
上記以外***	-	-	0	36	0
合計	**528******	**462**	**66******	**63**	**3**

*2004 年 10 月 7 日～2016 年 3 月 30 日の調査結果。環境動態の分野は、2022 年に申請者による追加の第 2 段階の適合性評価及び信頼性評価による結果を反映したもの。

**2016 年 3 月 1 日～2022 年 1 月 31 日の調査結果

***「薬効試験」「当該有効成分、代謝物とは関連性がない」「リスク評価対象生物種ではない」等の合計

****重複分を除いた数

表 3.1-2 適合性評価第 2 段階で適合性ありとされた文献の分類結果及び信頼性評価結果

		該当する論文数		
分野		**区分 a**	**区分 b**	**区分 c**
ヒトに対する毒性		-	-	-
農作物及び畜産物への残留		-	-	-
生活環境動植物及び家畜に対する毒性		-	-	-
環境動態		1	-	2
合計		**1**	**0**	**2**
信頼性評価結果 (Klimisch 分類)	Klimisch 1	0	-	-
	Klimisch 2	0	-	-
	Klimisch 3	1	-	-
	Klimisch 4	0	-	-
合計		1	-	-

3.2 和文文献の調査結果

検索をおこなった全期間（2007 年 1 月 1 日～2022 年 1 月 31 日）の調査結果のまとめを表 3.2-1 に示す。

表 3.2-1 評価目的との適合性評価（第 1 段階、第 2 段階）の結果のまとめ

分野	該当する論文数	第1 段階		第2 段階	
		適合性なし	それ以外（第 2 段階へ）	適合性なし	適合性あり (区分 a+b+c)
ヒトに対する毒性	3	0	-	-	-
農作物及び畜産物への残留	15	0	-	-	-
生活環境動植物及び家畜に対する毒性	12	0	-	-	-
環境動態	12	0	-	-	-
上記以外*	-	16	0	-	-
合計	16**	16	0	0	0

*「薬効試験」「当該有効成分、代謝物とは関連性がない」「リスク評価対象生物種ではない」等の合計

**重複分を除いた数

以上

Prosulfocarb

NOTIFICATION OF AN ACTIVE SUBSTANCE UNDER COMMISSION REGULATION (EU) 844/2012

DOCUMENT M-CA, Section 9

Toxicological and Toxicokinetic Studies

LITERATURE DATA

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for prosulfocarb, its relevant metabolite(s) and the EU representative formulation A8545G (BOXER®).

CA 9.2 Author(s) of the review

Syngenta
Jealott's Hill International Research Centre
Bracknell
Berkshire
RG42 6EY
UK

CA 9.3 Summary: A brief summary indicating the purpose of the report, the methodology employed and the results obtained

This report summarises the search for "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites(s) dealing with side effects on health and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The exact search strategy is detailed in Tables 9.5-1 to -5 but a summary of the methodology employed is given below.

1. A very broad search was conducted in 18 scientific source databases (detailed in Table 9.5-2) for prosulfocarb and its metabolites or its representative formulation, using the names summarised below, in conjunction with any of the key words set out in Table 9.5-1.
2. Duplicates titles from between the data bases were automatically removed from the output.
3. A rapid assessment of the titles was conducted to remove any additional duplicates and any obviously irrelevant titles (where enough information was available from the title alone).
4. A further rapid assessment was conducted using summary abstracts and any clearly irrelevant titles were removed.
5. A detailed assessment of the full-text documents for the remaining titles was conducted using the criteria developed for study relevance (see Table 9.4.2-1).
6. Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below and further details are provided in Section 9.5.

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	46	28
Number of *summary records* excluded from the search results after rapid assessment for relevance**	43	27
Total number of *full-text* documents assessed in detail*	3	1
Number of *studies* excluded from further consideration after detailed assessment for relevance	3	1
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

The review has the objective of identifying "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites(s) dealing with side effects on health and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

CA 9.4.2 Criteria for relevance with which decisions to select studies in the dossier were made

Table 9.4.2-1: List of Criteria for relevance for toxicological and toxicokinetic studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
*CA 5.1 ADME studies	1. Well identified test material including purity and impurity profile 2. Relevant test species e.g. rodent – rat/mouse – non-rodent – dog 3. Relevant endpoint e.g. ADME measurement or metabolite identification 4. Well described condition of the test and quantitative assessment of results to substantiate and evaluate whether the study conclusions and endpoints are robust
*CA 5.2 Acute toxicity	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rats and mice, rabbit, guinea pig 3. Relevant route of administration for risk assessment 4. Describe observations, examinations, analyses performed or necropsy 5. Different outcome to those studies currently reported
*CA 5.4 Genotoxicity	1. Well identified test material including purity and impurity profile 2. Relevant cell line or species used 3. "validated" or widely used test method 4. In vitro observation not addressed by in vivo data (including tissue specific effects) 5. In vivo effect in somatic or germs cells in relevant species 6. Relevant route of exposure to test substance 7. Contradicts submitted studies, impacts WoE. 8. Recognised methods for scoring studies outcomes used where applicable

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
*CA 5.3, 5.5, 5.6, 5.7, 5.8.1 Short term, chronic, reproductive and neurotoxicity, studies on metabolites	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rodents rats and mice, non- rodent dog is preferred 3. Sufficient number of animals per group to establish statistical significance 4. Test several dose levels (minimum 3) 5. Relevant route of administration for risk assessment 6. Include negative control (preferable) 7. Establish dose response 8. Describe observations, examinations, analyses performed or necropsy 9. Contradicts submitted studies and/or changes key endpoints
CA 5.8.2 Supplementary studies on the prosulfocarb	1. Identified test material 2. Unusual routes of exposure acceptable as they may introduce important information on other possible toxicological effects 3. Regulatory use usually limited to addressing species sensitivity /safety factors etc. 4. Examples of studies a. Effects of combined exposures b. Hormonal effects (if not guideline studies or included in 5.8.3) c. Hypersensitivity of specific sub-populations d. Gender and age variation in susceptibility (if not included in 5.6 Reproductive studies) e. Mode of action investigations
CA 5.8.3 Endocrine disrupting properties	1. Identified test material 2. All studies considered relevant at this stage – need to be checked for reliability
CA 5.9 Medical data (including epidemiology) CP 7.2 to 7.4	1. Identified test material 2. All records considered relevant at this stage - need to be checked for reliability

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Any documents deemed relevant will be checked for reliability according to the criteria described by Klimisch *et al* (1997)[1] using the ToxRTool (http://ihcp.jrc.ec.europa.eu/our_labs/eurl-ecvam/archive-publications/toxrtool).

Table 9.4.2-2: List of Criteria for relevance for operator exposure information/studies

Data requirements(s) (indicated by the correspondent CP data point (s))	Criteria for relevance
General criteria CP 7.2 all sections	5. Sufficient replicates must be included in the study to demonstrate statistical robustness 6. Agronomic practices must be relevant to scenario in submission, including: crop type ,application method and parameters (e.g. boom height), application rate 7. Leaf type and plant growth stage must be relevant to scenario in submission 8. Climactic/meteorological conditions of study must be relevant to scenario in submission, including rainfall, wind speed and temperature 9. Raw data must be available for analysis 10. Statistical analysis must be robust and relevant 11. Assessment of outliers/extreme values must be robust and relevant
Operator/worker exposure studies CP 7.2.1.2 and CP 7.2.3.2	1. Studies should follow accepted OECD protocol 2. Studies performed to GLP are preferred 3. Replicates should be minimum of 10
Biomonitoring studies CP 7.2.1.2, CP 7.2.2.2 and CP 7.2.3.2	1. Internal exposures must be clearly related to specific external doses 2. Replicates should be minimum of 10

[1] Klimisch H-J, Andreae M and Tillmann U (1997) A Systematic Approach for Evaluating the Quality of Experimental Toxicological and Ecotoxicological Data. Reg Tox Pharmacol 25, 1-5

Data requirements(s) (indicated by the correspondent CP data point (s))	Criteria for relevance
Air monitoring studies CP 7.2.2.2	10. Monitoring parameters must be relevant to bystander/resident exposures, including monitoring distance, height and duration: 11. Accurate logs of relevant local activity must be available (e.g. crop spraying) 12. Accurate logs of local climactic/meteorological conditions must be available for the duration of the monitoring period, including rainfall, wind speed, wind direction, temperature and humidity
Dislodgeable foliar residue studies CP 7.2.3.2	1. Study must have been conducted on a similar formulation 2. Application number and interval must be relevant 3. Replicates must be minimum of 40
Foliar decline studies CP 7.2.3.2	3. Data must demonstrate minimum of two clear half lives 4. Sufficient data points must be provided to demonstrate decline curves between repeat applications 5. Studies with significant rainfall in first 48 hours should be discounted 6. Replicates must be minimum of 10

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

CA 9.5 Search methods

Date of initial search	7 October 2014
Date of most recent update to search	30 March 2016
Date span of the search	10 years

Table 9.5-1: Detailed Search Parameters for Toxicological and Toxicokinetic studies (CA 5.1 to 5.9)

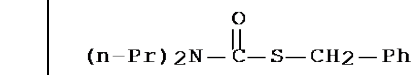
Search Strategy
1 Query Profile **Prosulfocarb** L1 QUE SPE=ON ABB=ON PLU=ON (52888-80-9 OR 123780-41-6 OR (PHENYLMETHYL OR BENZYL)(W)DIPROPYLCARBAMOTHIOAT#) L2 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(W)ESTER(W)DIPROPYL(W)CARBAMOTHIOIC(W)ACID OR (BENZYL OR PHENYLMETHYL)(W)ESTER(W)DIPROPYLZHIO(W)CARBAMIC(W)ACID) L3 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(2W)(DIPROPYLTHIOLCARBAMAT# OR DIPROPYLTHIOCARBAMAT# OR DIPROPYL(W)THIOLCARBAMAT# OR DIPROPYL(W)THIOCARBAMAT#) OR PROSULFOCARB# OR PROSULFUROCARB OR PROSULPHOCARB#) L4 QUE SPE=ON ABB=ON PLU=ON (BENZYLDIPROPYLTHIOCARBAMAT# OR DIPROPYL(W)THIOCARBAMIC(W)ACID(1W)BENZYL(W)ESTER OR PROPYLTHIOCARBAMAT# OR BENZYLDIPROPYL(W)THIOCARBAMAT#) L5 QUE SPE=ON ABB=ON PLU=ON (R(W)15574 OR R15574 OR ICIA0574 OR ICI(W)A0574 OR ICIA(W)0574 OR ICI(1W)0574 OR ICI(1W)574 OR BRN(W)4804364 OR BRN4804364) L6 QUE SPE=ON ABB=ON PLU=ON (SC(W)0574 OR SC0574 OR SC574 OR SC(W)574 OR ARCADE OR ARKADE OR AUROS OR BOXER? OR DEFI OR

```
                DEFY)
L7              QUE SPE=ON  ABB=ON  PLU=ON  (PESTI!ID? OR HERBI!ID? OR
                WEEDKILLER? OR WEED#(A)KILL? OR WEED#(S)(CONTROL? OR
SUPPRESS?)
                 OR DEFOLIANT OR CROP(W)SAFETY OR SAFENER OR (PLANT OR
                CROP)(S)PROTECT?)
L8              QUE SPE=ON  ABB=ON  PLU=ON  (L6(S)L7)
L9              QUE SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5) OR
L8

Prosulfocarb Metabolites
L10             QUE SPE=ON  ABB=ON  PLU=ON  (51954-81-5 OR SYN521384 OR
                SYN(W)521384 OR R(W)331405 OR R331405 OR (PROSULFOCARB OR
                PROSULPHOCARB)(3A)(SULFOXIDE OR SULPHOXIDE))
L11             QUE SPE=ON  ABB=ON  PLU=ON
(BENZYLSULFINYL(4W)DIPROPYLMETHANAM
                ID# OR PHENYLMETHYL(W)SULFINYL(3W)DIPROPYL(W)FORMAMID#)
L12             QUE SPE=ON  ABB=ON  PLU=ON  (61772-67-6 OR R245699 OR
R(W)24569
                9 OR (2(W)DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID
OR
                2(W)(DIPROPYLCARBAMOYL(W)THIO)(5A)ACETIC(W)ACID OR
S(W)DIPROPYL
                CARBAMOYL(W)MERCAPTOACETIC(W)ACID OR
2(W)DIPROPYLCARBAMOYLSULFA
                NYL(W)ACETIC ACID)
L13             QUE SPE=ON  ABB=ON  PLU=ON
(DIPROPYLCARBAMOYL(W)MERCAPTOACETIC
                (W)ACID OR DIPROPYLCARBAMOYL(W)MERCAPTO(W)ACETIC(W)ACID OR
                (DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID)
L14             QUE SPE=ON  ABB=ON  PLU=ON  (SYN545179 OR SYN(W)545179 OR
                2(W)HYDROXY(W)3(W)PHENYLMETHANESULFINYL(W)(PROPIONIC OR
                PROPANOIC)(W)ACID OR
3(W)BENZYLSULFINYL(W)2(W)HYDROXY(W)(PROPIO
                NIC OR PROPANOIC)(W)ACID)
L15             QUE SPE=ON  ABB=ON  PLU=ON
(HYDROXY(1W)PHENYLMETHANESULFINYL(W
                )(PROPIONIC OR PROPANOIC)(W)ACID OR
BENZYLSULFINYL(1W)HYDROXY(W
                )(PROPIONIC OR PROPANOIC)(W)ACID)
L16             QUE SPE=ON  ABB=ON  PLU=ON  (L10 OR L11 OR L12 OR L13 OR L14
                OR L15)
L17             QUE SPE=ON  ABB=ON  PLU=ON  L9 OR L16
```

2. Prosulfocarb - CAS Registry data as of March 30, 2016

```
L92  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   52888-80-9  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Carbamothioic acid, N,N-dipropyl-, S-(phenylmethyl) ester  (CA INDEX
NAME)
OTHER CA INDEX NAMES:
CN   Carbamic acid, dipropylthio-, S-benzyl ester (7CI)
CN   Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester (9CI)
OTHER NAMES:
CN   Arkade
```

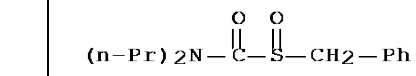
```
CN   Benzyl dipropylthiolcarbamate
CN   Boxer
CN   Boxer (ICI Agrochemicals)
CN   Boxer 800EC
CN   Boxer EC
CN   Defi
CN   Prosulfocarb
CN   R 15574
CN   S-Benzyl dipropylthiocarbamate
CN   S-Benzyl dipropylthiolcarbamate
CN   S-Benzyl N,N-dipropylthiocarbamate
CN   SC 0574
DR   123780-41-6
MF   C14 H21 N O S
CI   COM
SR   CA
LC   STN Files:   BIOSIS, CA, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, CIN,
       IFIALL, MEDLINE, MSDS-OHS, PIRA, REAXYSFILE*, RTECS*, TOXCENTER,
USPAT2,
       USPATFULL, USPATOLD
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

             470 REFERENCES IN FILE CA (1907 TO DATE)
             167 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
             478 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

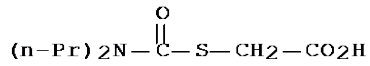
3. Metabolites - CAS Registry data

```
CAS Registry data as of October 29, 2015
L93  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   51954-81-5  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Formamide, 1-[(phenylmethyl)sulfinyl]-N,N-dipropyl- (9CI)  (CA INDEX
NAME)
MF   C14 H21 N O2 S
CI   COM
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, USPATFULL
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               4 REFERENCES IN FILE CA (1907 TO DATE)
               4 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

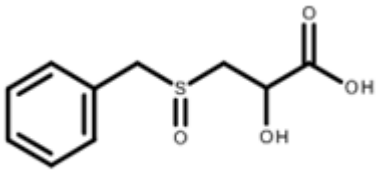
```
CAS Registry data as of February 5, 2016
L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2016 ACS on STN
RN   61772-67-6  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Acetic acid, 2-[[(dipropylamino)carbonyl]thio]-  (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN   Acetic acid, [[(dipropylamino)carbonyl]thio]- (9CI)
OTHER NAMES:
CN   S-(Dipropylcarbamoyl)mercaptoacetic acid
MF   C9 H17 N O3 S
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, TOXCENTER
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               1 REFERENCES IN FILE CA (1907 TO DATE)
               1 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

4. Metabolites with no CAS Registry data

No data available as of February 5, 2016



SYN545179

SYN545179
CSCD097565
C10H12O4S
2-Hydroxy-3-phenylmethanesulfinyl-propionic acid
3-benzylsulfinyl-2-hydroxy-propanoic acid

Plus

```
L1              QUE  (MUTAG? OR CANCER? OR TERATO? OR GENETOX? OR CARCIN?)
L2              QUE  (TUMOUR? OR TUMOR? OR CYTOTOX? OR GENOTOX? OR MELANOM?)
L3              QUE  (NEUROTOXI? OR LD50 OR IC50 OR ((LD OR IC)(W)50))
L4              QUE  (((LONG OR SHORT)(W)TERM?)(L)(EFFECT? OR STUD? OR
TOXIC?))
L5              QUE  (ENDOCRIN? OR INHALAT? OR IRRITAT? OR REPROTOX?)
L6              QUE  (PERCUTANEOU? OR DERMAL? OR ORAL? OR INTOXICAT? OR
INGEST?)
L7              QUE  (((REPRODUCT? OR EMBRYO? OR FOET? OR
DEVELOP?)(5A)TOXI?))
```

```
L8              QUE  ((ACUTE? OR CHRONIC?)(5A)(EFFECT? OR TOXIC? OR TOXIN#))
L9              QUE  (GIRL# OR CHILD OR CHILDREN OR PATIENT# OR HUMAN# OR
MAN)
L10             QUE  (MEN OR WOM!N OR BOY# OR WORKER# OR OPERATOR# OR
FARMER#)
L11             QUE  (APPLICATOR# OR PERSONNEL? OR WORKFORCE OR EMPLOYEE#)
L12             QUE  (MAMMAL? OR RODENT# OR RAT OR RATS OR MOUSE OR MICE)
L13             QUE  (ACCIDENT? OR POISON? OR ALLERG? OR EXPOSURE? OR
EXPOSE#)
L14             QUE  (OCCUPAT? OR EPIDEMIOL? OR SENSITIZ? OR SENSITIS?)
L15             QUE  ((HEALTH OR ADVERSE)(5A)(EFFECT# OR RISK#))
L16             QUE  (MEDICAL OR (FIRST(W)AID) OR (TOXIC?(3A)STUD?) OR
THERAPE?)
L17             QUE  (TOXICOKINETIC# OR EXTRACTAB? OR (RADIO(W)LABEL?))
L18             QUE  (DOG# OR (GUINEA(W)PIG#) OR RABBIT# OR SKIN? OR EYE#)
L19             QUE  (HAND# OR DERMAL? OR BYSTANDER# OR RESIDENT#)
L20             QUE  ((ROTAT? OR SUCCEDING OR FOLLOWING)(3A)CROP#)
L21             QUE  ((DIETARY OR CONSUM? OR CUMULAT? OR AGGREGAT?)(5A)RISK?)
L22             QUE  (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR
L10
                      OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR
L19
                      OR L20 OR L21)
```

Table 9.5-1: Detailed Search Parameters for Toxicological and Toxicokinetic studies (CA 5.1 to 5.9)

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	6
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		0
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0 (1)
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		0 (1)
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		4 (2)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		10 (6)
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		25 (3)

Provider	Database	Justification	Limits applied	Number*
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (8)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		1 (3)
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		0 (4)
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		0

Provider	Database	Justification	Limits applied	Number*
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0
	HCHEMLIST	The database identifies the regulatory requirements for a specific substance from many of the world's most significant regulated substances lists. It records substance identity information, inventory status, source of information, and summaries of regulatory activity, reports, and other compliance information.		0
	CROPU	The database covers all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. The database draws on 1,100 scientific journals, conference proceedings, and patents beginning in 1996. Records contain bibliographic information, titles, abstracts, in-depth indexing, and Enzyme Commission Numbers. Spans the period 1985 to 2003.		0
	CROPB	The Crop Protection Backfile is the companion backfile to the current Crop Protection File, CROPU, covering all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. Bibliographic information and indexing terms are searchable. Spans the period 1968 to 1984.		0

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	46	28
Number of *summary records* excluded from the search results after rapid assessment for relevance**	43	27
Total number of *full-text* documents assessed in detail*	3	1
Number of *studies* excluded from further consideration after detailed assessment for relevance	3	1
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles

Following exclusion of references from the rapid assessment, the full text was assessed from the remaining 4 titles which were identified as potentially relevant or unclear on the basis of their titles. Full details of these papers are given in the tables below.

Table 9.6-2: List of references for all relevant and unclear studies listed by data point number

CA data point number	Author(s)	Year	Title	Source
Initial search				
CA 5.9	Fantke P; Friedrich R; Jolliet O.	2012	Health impact and damage cost assessment of pesticides in Europe	Environmental International 49 9-17
CA 5.2	Stephanie V; Laurent M; Hélène C; Abderrazak Y; Hélène m; Armelle B S.	2011	Role and size of composition of traffic and agricultural aerosols in the molecular responses triggered in airway epithelial cells	Inhalation Toxicology 23 (11) 627-640
CA 5.9	Hayat K; Ashraq M; Ashraq U; Saleem M A.	2010	Determination of pesticide residues in blood samples of villagers involved in pesticide application at District Vehari (Punjab), Pakistan	African Journal of Environmental Science and Technology 4 (10) 666-684
Top-Up search				
CA 5.2	Hamadache M; Khaouane L; Benkortbi O; Si Moussa C Hanini S; Amrane A	2014	Prediction of Acute Herbicide Toxicity in Rats from Quantitative Structure–Activity Relationship Modeling	Environmental Engineering Science 31(5), 243-252

Table 9.6-3: List of references for all relevant and unclear studies listed by Author

Author(s)	Year	CA data point number	Title	Source
Initial Search				
Fantke P; Friedrich R; Jolliet O.	2012	CA 5.9	Health impact and damage cost assessment of pesticides in Europe	Environmental International 49 9-17

Author(s)	Year	CA data point number	Title	Source
Hayat K; Ashraq M; Ashraq U; Saleem M A.	2010	CA 5.9	Determination of pesticide residues in blood samples of villagers involved in pesticide application at District Vehari (Punjab), Pakistan	African Journal of Environmental Science and Technology 4 (10) 666-684
Stephanie V; Laurent M; Hélène C; Abderrazak Y; Hélène m; Armelle B S.	2011	CA 5.2	Role and size of composition of traffic and agricultural aerosols in the molecular responses triggered in airway epithelial cells	Inhalation Toxicology 23 (11) 627-640
Top-Up search				
Hamadache M; Khaouane L; Benkortbi O; Si Moussa C Hanini S; Amrane A	2014	CA 5.2	Prediction of Acute Herbicide Toxicity in Rats from Quantitative Structure–Activity Relationship Modeling	Environmental Engineering Science 31(5), 243-252

A detailed review of the full-text documents identified in Table 9.6-2 resulted in the additional exclusion of the following studies from the dossier.

Table 9.6-4: List of references excluded following detailed review listed by data point number

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
Initial search					
CA 5.9	Fantke P; Friedrich R; Jolliet O.	2012	Health impact and damage cost assessment of pesticides in Europe	Environmental International 49 9-17	Epidemiology paper reviewing a number of pesticides in Europe. Prosulfocarb is not tested individually therefore no new data is presented that would change the current position on toxicity or mode of action
CA 5.2	Stephanie V; Laurent M; Hélène C; Abderrazak Y; Hélène m; Armelle B S.	2011	Role and size of composition of traffic and agricultural aerosols in the molecular responses triggered in airway epithelial cells	Inhalation Toxicology 23 (11) 627-640	Paper does not test proulfocarb individually therefore no new data is presented that would change the current position on toxicity or mode of action
CA 5.9	Hayat K; Ashraq M; Ashraq U; Saleem M A.	2010	Determination of pesticide residues in blood samples of villagers involved in pesticide application at District Vehari (Punjab), Pakistan	African Journal of Environmental Science and Technology 4 (10) 666-684	Epidemiology paper reviewing a number of pesticides in Europe. Prosulfocarb is not tested individually therefore no new data is presented that would change the current position on toxicity or mode of action

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
Top-Up search					
CA 5.2	Hamadache M; Khaouane L; Benkortbi O; Si Moussa C Hanini S; Amrane A	2014	Prediction of Acute Herbicide Toxicity in Rats from Quantitative Structure–Activity Relationship Modeling	Environmental Engineering Science 31(5), 243-252	Development of WSAR modelling for predicting acute toxicity. Prosulfocarb is not tested individually therefore no new data is presented that would change the current position on toxicity or mode of action

All documents listed in Table 9.6-2 were assessed in detail and have been excluded i.e. listed in Table 9.6-4 as not relevant to the toxicology endpoints for prosulfocarb and have therefore not been discussed further.

Prosulfocarb

NOTIFICATION OF AN ACTIVE SUBSTANCE UNDER COMMISSION REGULATION (EU) 844/2012

DOCUMENT M-CA, Section 9

Metabolism and Residues Data

LITERATURE DATA

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for prosulfocarb, its relevant metabolite(s) and the EU representative formulation A8545G (BOXER®).

CA 9.2 Author(s) of the review

Syngenta
Jealott's Hill International Research Centre
Bracknell
Berkshire
RG42 6EY
UK

CA 9.3 Summary: A brief summary indicating the purpose of the report, the methodology employed and the results obtained

This report summarises the search for "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites(s) dealing with metabolism and residues data which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The exact search strategy is detailed in the Tables 9.5-1 to -5 but a summary of the methodology employed is given below.

1. A very broad search was conducted in 18 scientific source databases (detailed in Table 9.5-2) for prosulfocarb and its metabolites using the search terms listed in CA 9.5.1.
2. Duplicates titles from between the data bases were automatically removed from the output.
3. A rapid assessment of the titles was conducted to remove any additional duplicates and any obviously irrelevant titles (where enough information was available from the title alone).
4. A further rapid assessment was conducted using summary abstracts and any clearly irrelevant titles were removed.
5. A detailed assessment of the full-text documents for the remaining titles was conducted using the criteria developed for study relevance (see Table 9.4.2-1)
6. Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below and full details are provided in Section 9.5.

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	99	31
Number of *summary records* excluded from the search results after rapid assessment for relevance**	99	31
Total number of *full-text* documents assessed in detail*	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

The review has the objective of identifying "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites dealing with metabolism and residue studies which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

CA 9.4.2 Criteria for relevance with which decisions to select studies in the dossier were made

Table 9.4.2-1: List of Criteria for relevance for each data requirement

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Metabolism and residues data (CA 6.1 to 6.9)	
Summary	The relevance criteria applied to determine whether a literature reference was relevant for the residues and metabolism sections of the active substance renewal process are given below. 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. did the study meet the relevant guidelines? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. was the compound used previously at the trial site; was the animal feed free from the compound? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 6. Validated Analytical methodology employed. e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	7. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.1 Storage Stability of Residues (plant and animal)	Storage Stability Studies 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. did the study meet the relevant guidelines and GAP? 4. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 5. Validated analytical methodology employed e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 6. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.2 Metabolism, distribution and Expression of Residues (plant and animal) **CA 6.6.2 Metabolism and Distribution in Succeeding Crops**	1. Well defined test material. e.g. if radiolabelled material was used, was an appropriate isotope used? 2. Applicable test species. e.g. ruminant, poultry, etc.? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. is the application rate relevant and equivalent to maximum seasonal rate on rotated crops? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. is plot history supplied? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. Were metabolites identified by appropriate techniques? 6. Validated analytical methodology employed. e.g. were representative clear chromatograms provided to support metabolite identification? 7. Study conditions do not interfere with the interpretation of the study results. e.g. if the test item is photolabile was the study conducted outdoors?
CA 6.3 Magnitude of Residues Trials in Plants	Published monitoring reports were not considered relevant due to the fact that it would not be possible to determine whether or not a misuse scenario had resulted in the residue levels reported. Crop Studies 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. 7. Study conditions should not interfere with the interpretation of the study results. Notes for above criteria 1. Well defined test material (including purity/content) e.g. was the formulation comparable to the proposed representative formulation? 2. Applicable test species

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. is it a representative use crop? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Is the GAP relevant? Correct rate, application method, interval, PHI, spray volume, BBCH (if applicable), region, indoor/outdoor, control samples taken? e.g. were weather details available? e.g. were the control plots well separated from treated plots? e.g. was the field phase conducted according to GLP? e.g. were samples stored deep frozen? Were appropriate numbers of samples taken, e.g. 2kg of apples? e.g. was appropriate sampling methodology employed? Was the sample handling traceable? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. Plot history supplied, e.g. evidence that compound not used that year or previous year, and information on other plant protection products (e.g. to check for common metabolites). 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above and also, have they proposed an endpoint, e.g. MRL, what statistical methods have they used for this? 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Was a validated method used, were acceptable recoveries obtained, were control samples analysed, were control samples 'clean', were representative clear chromatograms provided, Was the analytical phase conducted according to GLP? Were all components of the residue definition analysed for? Were samples analysed within a time period covered by storage stability data?
CA 6.4 Livestock Feeding Studies	Same criteria as for crop studies, examples could be as above with the following additions. <u>Livestock Feeding Studies Notes</u> 1. Well defined test material (including purity/content) 2. Applicable test species e.g. Ruminant, poultry, pig, fish, any edible animal. 3. Study conditions should not differ significantly from recommended protocols. e.g. is the dosing level extreme? e.g. was the application form appropriate, e.g. capsule? e.g. was the number of test species correct, e.g. three cows, nine hens? e.g. was the dosing period appropriate, e.g. minimum 28 days? e.g. were control animals included? e.g. were the animals healthy? e.g. were the animals acclimatized? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. is it clear that additional animal feed did not contain treated substance? 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
CA 6.5 Effects of Processing	High Temperature Hydrolysis 1. Well defined test material (including purity/content) e.g. if radiolabelled test item was used, was an appropriate isotope used (e.g. ^{14}C and not ^{3}H)? e.g. if radiolabelled test item was used, was the labelling position(s) appropriate to capture potential metabolites? e.g. if radiolabelled test item was used, was the specific activity adequate to meet an LOQ of 0.01 mg/kg? N.B. If water solubility of test item is < 0.01 mg/L then no study is required and can be deemed non-relevant 2. Applicable test system e.g. Was the test undertaken in a sterilised buffer medium? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Were the temperature and pH conditions applied typical of processing operations carried out on commodities relevant to the test item? e.g. were samples stored deep frozen? 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above e.g. Were metabolites identified by appropriate techniques (e.g. co-chromatography with known standards using two dissimilar chromatographic systems or by techniques capable of positive structural identification e.g. MS, NMR)? 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Were relevant control experiments carried out when harsher techniques (e.g. acid/base hydrolysis) were used to identify metabolites (i.e. to ensure metabolites identified are not merely artefacts)? e.g. were representative clear chromatograms provided to support metabolite identification? e.g. where sample analysis exceeded 6 months from sample collection was storage stability of samples demonstrated? 7. Study conditions should not interfere with the interpretation of the study results. Field Studies 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.6 Residues in Rotational crops	Same criteria as for crop residue studies, examples could be subtly different, e.g. acceptable PBIs, crop types, again monitoring information should not be considered relevant.
CA 6.7 Proposed residue definition and MRLs	Residue definition would only be affected if data generated in another section, e.g. metabolism/tox. MRLs would only be affected if residues generated and this is

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	covered under CA 6.3.
CA 6.8 Proposed Safety Intervals	Not required. Any animal safety reports that might affect withholding periods would be covered in the review of literature in the Toxicology Section.
CA 6.9 Risk Assessment	Not required – any adverse findings for the risk assessment will have to be due to a data point from one of the other sections, and are therefore covered in other sections of this document.
CA 6.10 Other Studies	Not required.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

CA 9.5 Search methods

Date of initial search	7 October 2014
Date of most recent update to search	30 March 2016
Date span of the search	10 years

For the initial rapid assessment the study titles and abstracts were scanned to identify whether studies were of potential relevance to crop and livestock metabolism and/or residue studies in the context of human exposure through the diet. Studies clearly not within the remit of Regulation (EU) No. 283/2013 and regulation (EU) No. 284/2013 (such as metabolism studies in environmental compartments or microorganisms, other environmental fate studies, toxicological studies, efficacy studies, studies on plants other than crops, and mode of action studies) were eliminated during rapid assessment. Studies on the development of analytical methods relevant to routine (multi-residue) monitoring of prosulfocarb residues in plant and animal commodities for compliance with MRLs, and reports summarising country monitoring data were also excluded from further consideration at rapid assessment.

Assessment of the full text of the remaining titles which were identified as potentially relevant or unclear on the basis of their titles and/or abstracts was conducted.

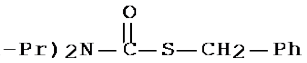
Table 9.5-1: Detailed Search Parameters for Metabolism and Residues data (CA 6.1 to 6.10) – Search Terms

Search Strategy
1 Query Profile **Prosulfocarb** L1 QUE SPE=ON ABB=ON PLU=ON (52888-80-9 OR 123780-41-6 OR (PHENYLMETHYL OR BENZYL)(W)DIPROPYLCARBAMOTHIOAT#) L2 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(W)ESTER(W)DIPROPYL(W)CARBAMOTHIOIC(W)ACID OR (BENZYL OR PHENYLMETHYL)(W)ESTER(W)DIPROPYLZHIO(W)CARBAMIC(W)ACID) L3 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(2W)(DIPROPYLTHIOLCARBAMAT# OR DIPROPYLTHIOCARBAMAT# OR DIPROPYL(W)THIOLCARBAMAT# OR DIPROPYL(W)THIOCARBAMAT#) OR PROSULFOCARB# OR

```
                PROSULFUROCARB OR PROSULPHOCARB#)
L4              QUE SPE=ON  ABB=ON  PLU=ON  (BENZYLDIPROPYLTHIOCARBAMAT# OR
                DIPROPYL(W)THIOCARBAMIC(W)ACID(1W)BENZYL(W)ESTER OR
PROPYLTHIOC
                ARBAMAT# OR BENZYLDIPROPYL(W)THIOCARBAMAT#)
L5              QUE SPE=ON  ABB=ON  PLU=ON  (R(W)15574 OR R15574 OR ICIA0574
                OR ICI(W)A0574 OR ICIA(W)0574 OR ICI(1W)0574 OR ICI(1W)574 OR
                BRN(W)4804364 OR BRN4804364)
L6              QUE SPE=ON  ABB=ON  PLU=ON  (SC(W)0574 OR SC0574 OR SC574 OR
                SC(W)574 OR ARCADE OR ARKADE OR AUROS OR BOXER? OR DEFI OR
                DEFY)
L7              QUE SPE=ON  ABB=ON  PLU=ON  (PESTI!ID? OR HERBI!ID? OR
                WEEDKILLER? OR WEED#(A)KILL? OR WEED#(S)(CONTROL? OR
SUPPRESS?)
                 OR DEFOLIANT OR CROP(W)SAFETY OR SAFENER OR (PLANT OR
                CROP)(S)PROTECT?)
L8              QUE SPE=ON  ABB=ON  PLU=ON  (L6(S)L7)
L9              QUE SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5) OR
L8

Prosulfocarb Metabolites
L10             QUE SPE=ON  ABB=ON  PLU=ON  (51954-81-5 OR SYN521384 OR
                SYN(W)521384 OR R(W)331405 OR R331405 OR (PROSULFOCARB OR
                PROSULPHOCARB)(3A)(SULFOXIDE OR SULPHOXIDE))
L11             QUE SPE=ON  ABB=ON  PLU=ON
(BENZYLSULFINYL(4W)DIPROPYLMETHANAM
                ID# OR PHENYLMETHYL(W)SULFINYL(3W)DIPROPYL(W)FORMAMID#)
L12             QUE SPE=ON  ABB=ON  PLU=ON  (61772-67-6 OR R245699 OR
R(W)24569
                9 OR (2(W)DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID
OR
                2(W)(DIPROPYLCARBAMOYL(W)THIO)(5A)ACETIC(W)ACID OR
S(W)DIPROPYL
                CARBAMOYL(W)MERCAPTOACETIC(W)ACID OR
2(W)DIPROPYLCARBAMOYLSULFA
                NYL(W)ACETIC ACID)
L13             QUE SPE=ON  ABB=ON  PLU=ON
(DIPROPYLCARBAMOYL(W)MERCAPTOACETIC
                (W)ACID OR DIPROPYLCARBAMOYL(W)MERCAPTO(W)ACETIC(W)ACID OR
                (DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID)
L14             QUE SPE=ON  ABB=ON  PLU=ON  (SYN545179 OR SYN(W)545179 OR
                2(W)HYDROXY(W)3(W)PHENYLMETHANESULFINYL(W)(PROPIONIC OR
                PROPANOIC)(W)ACID OR
3(W)BENZYLSULFINYL(W)2(W)HYDROXY(W)(PROPIO
                NIC OR PROPANOIC)(W)ACID)
L15             QUE SPE=ON  ABB=ON  PLU=ON
(HYDROXY(1W)PHENYLMETHANESULFINYL(W
                )(PROPIONIC OR PROPANOIC)(W)ACID OR
BENZYLSULFINYL(1W)HYDROXY(W
                )(PROPIONIC OR PROPANOIC)(W)ACID)
L16             QUE SPE=ON  ABB=ON  PLU=ON  (L10 OR L11 OR L12 OR L13 OR L14
                OR L15)
L17             QUE SPE=ON  ABB=ON  PLU=ON  L9 OR L16
```

2. Prosulfocarb - CAS Registry data as of March 30, 2016

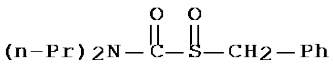
```
L92  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   52888-80-9  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Carbamothioic acid, N,N-dipropyl-, S-(phenylmethyl) ester  (CA INDEX
NAME)
OTHER CA INDEX NAMES:
CN   Carbamic acid, dipropylthio-, S-benzyl ester (7CI)
CN   Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester (9CI)
OTHER NAMES:
CN   Arkade
CN   Benzyl dipropylthiolcarbamate
CN   Boxer
CN   Boxer (ICI Agrochemicals)
CN   Boxer 800EC
CN   Boxer EC
CN   Defi
CN   Prosulfocarb
CN   R 15574
CN   S-Benzyl dipropylthiocarbamate
CN   S-Benzyl dipropylthiolcarbamate
CN   S-Benzyl N,N-dipropylthiocarbamate
CN   SC 0574
DR   123780-41-6
MF   C14 H21 N O S
CI   COM
SR   CA
LC   STN Files:   BIOSIS, CA, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, CIN,
       IFIALL, MEDLINE, MSDS-OHS, PIRA, REAXYSFILE*, RTECS*, TOXCENTER,
USPAT2,
       USPATFULL, USPATOLD
         (*File contains numerically searchable property data)
```



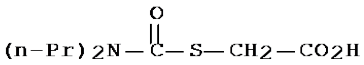
```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

             470 REFERENCES IN FILE CA (1907 TO DATE)
             167 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
             478 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

3. Metabolites - CAS Registry data

```
CAS Registry data as of October 29, 2015
L93  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   51954-81-5  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Formamide, 1-[(phenylmethyl)sulfinyl]-N,N-dipropyl- (9CI)  (CA INDEX
NAME)
MF   C14 H21 N O2 S
CI   COM
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, USPATFULL
         (*File contains numerically searchable property data)
```



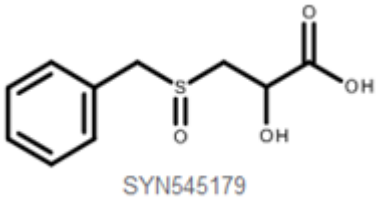
```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               4 REFERENCES IN FILE CA (1907 TO DATE)
               4 REFERENCES IN FILE CAPLUS (1907 TO DATE)


CAS Registry data as of February 5, 2016
L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2016 ACS on STN
RN   61772-67-6  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Acetic acid, 2-[[(dipropylamino)carbonyl]thio]-  (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN   Acetic acid, [[(dipropylamino)carbonyl]thio]- (9CI)
OTHER NAMES:
CN   S-(Dipropylcarbamoyl)mercaptoacetic acid
MF   C9 H17 N O3 S
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, TOXCENTER
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               1 REFERENCES IN FILE CA (1907 TO DATE)
               1 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

4. Metabolites with no CAS Registry data

No data available as of February 5, 2016



SYN545179

SYN545179
CSCD097565
C10H12O4S
2-Hydroxy-3-phenylmethanesulfinyl-propionic acid
3-benzylsulfinyl-2-hydroxy-propanoic acid

plus

L1 QUE (METABOL? OR RESIDUE# OR TRANSFORM? OR BIOTRANSFORM?)
L2 QUE (DEGRAD? OR BIODEGRAD? OR FATE# OR MRL OR MRLS)
L3 QUE (CONJUGAT? OR EXCRET? OR ELIMINAT?)
L4 QUE (FOOD# OR FEED# OR DIET# OR DIETARY OR CONSUMER? OR HUMAN#)
L5 QUE (CONTAMINAT? OR SAFE? OR EXPOS? OR ANALY? OR ASSES?)
L6 QUE (INTAKE? OR (IN(W)TAKE?) OR SURVEY? OR RISK?)
L7 QUE (TOXIC? OR STUDY? OR STUDIES?)
L8 QUE (L4(10A)(L5 OR L6 OR L7))
L9 QUE (LIVESTOCK# OR COW# OR GOAT# OR CATTLE# OR BULLOCK#)
L10 QUE (BOVINE? OR BOVIDAE? OR BOS OR BULL# OR HEIFER? OR CAPRA#)
L11 QUE (SHEEP# OR EWE OR EWES OR RAM# OR SWINE# OR PIGLET#)
L12 QUE (PIG# OR SUIDAE? OR SUS OR OVIS OR OX OR OXEN)
L13 QUE (RUMINANT? OR HEN# OR CHICKEN# OR FOWL# OR TURKEY?)
L14 QUE (DUCK# OR GOOSE OR GEESE OR CAPON# OR POULTRY?)
L15 QUE (MEAT OR MILK OR EGG# OR TISSUE#)
L16 QUE (((BROKEN? OR BREAK?)(W)(DOWN OR UP)) OR BREAKDOWN?)
L17 QUE (BREAKSDOWN? OR UPTAKE? OR PROCESSING? OR BOUND?)
L18 QUE ((NON(W)EXTRACTAB?) OR (ROTATIONAL(3A)CROP#))
L19 QUE ((L1 OR L2 OR L3) OR L8 OR (L9 OR L10 OR L11 OR L12 OR L13 OR L14) OR (L15 OR L16 OR L17 OR L18))

Table 9.5-2: Detailed Search Parameters for Metabolism and Residues data (CA 6.1 to 6.9)

Provider	Database	Justification	Limits applied	Number* (Top-up)
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	4
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		1
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		4
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		0
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		5
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		16 (3)
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		75 (11)

Provider	Database	Justification	Limits applied	Number* (Top-up)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		1
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (16)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		2 (1)
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		1
	SCISEARCH	Is an international index to the literature covering virually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		2
	ANABSTR	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0

Provider	Database	Justification	Limits applied	Number* (Top-up)
	HCHEMLIST	The database identifies the regulatory requirements for a specific substance from many of the world's most significant regulated substances lists. It records substance identity information, inventory status, source of information, and summaries of regulatory activity, reports, and other compliance information.		0
	CROPU	The database covers all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. The database draws on 1,100 scientific journals, conference proceedings, and patents beginning in 1996. Records contain bibliographic information, titles, abstracts, in-depth indexing, and Enzyme Commission Numbers. Spans the period 1985 to 2003.		0
	CROPB	The Crop Protection Backfile is the companion backfile to the current Crop Protection File, CROPU, covering all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. Bibliographic information and indexing terms are searchable. Spans the period 1968 to 1984.		0

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	99	31
Number of *summary records* excluded from the search results after rapid assessment for relevance**	99	31
Total number of *full-text* documents assessed in detail*	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

No titles were identified as potentially relevant or unclear during the rapid assessment for relevance, and therefore have not been considered further here or in MCA Section 6.

Prosulfocarb

NOTIFICATION OF AN ACTIVE SUBSTANCE UNDER COMMISSION REGULATION (EU) 844/2012

DOCUMENT M-CA, Section 9

Ecotoxicological Studies

LITERATURE DATA

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for prosulfocarb, its relevant metabolite(s) and the EU representative formulation A8545G (BOXER®).

CA 9.2 Author(s) of the review

Syngenta
Jealott's Hill International Research Centre
Bracknell
Berkshire
RG42 6EY
UK

CA 9.3 Summary: A brief summary indicating the purpose of the report, the methodology employed and the results obtained

This report summarises the search for "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites(s) dealing with side effects on health and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The exact search strategy is detailed in the Tables 9.5-1 to -5 but a summary of the methodology employed is given below.

1. A very broad search was conducted in 18 scientific source databases (detailed in Table 9.5-2) for prosulfocarb, its major metabolites or representative formulation, in conjunction with any of the ecotoxicology search terms listed in CA 9.5.1.

2. Duplicates titles from between the data bases were automatically removed from the output.

3. A rapid assessment of the titles was conducted to remove any additional duplicates and any obviously irrelevant titles (where enough information was available from the title alone).

4. A further rapid assessment was conducted using summary abstracts and any clearly irrelevant titles were removed.

5. A detailed assessment of the full-text documents for the remaining titles was conducted using the criteria developed for ecotoxicology study relevance (see Table 9.4.2-1)

6. Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below and further details are provided in Section 9.5.

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	41	31
Number of *summary records* excluded from the search results after rapid assessment for relevance**	36	29
Total number of *full-text* documents assessed in detail*	5	2
Number of *studies* excluded from further consideration after detailed assessment for relevance	5	2
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

The review has the objective of identifying "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites dealing with side effects on *environment* and published within the last *ten* years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

CA 9.4.2 Criteria for relevance with which decisions to select studies in the dossier were made

Table 9.4.2-1: List of Criteria for relevance for each data requirement

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Ecotoxicological studies (CA 8.1 to 8.15)	Laboratory Studies 1. Well defined test material (including purity/content) 2. Number of organisms per group sufficient to establish a statistical significance 3. Applicable test species 4. Test organisms are not previously exposed to the test material or other contaminants 5. Several dose levels tested, at least 3, including a negative control, to establish a dose-response, unless the study design is specifically a limit test. Control must be run concurrently with treatments and mortality to be within test validity criteria. 6. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 7. If conducted, analytical confirmation of dosing or sufficient information provided to determine concentrations were within acceptable range (e.g. 80-120%) of nominal targets. 8. Effects are related to single test item, and a quantitative relationship exists between the reported endpoint and risk assessment endpoints of growth, mortality, behaviour and/or reproduction. 9. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 10. Study conditions should not differ significantly from recommended protocols. 11. Study conditions should not interfere with the interpretation of the study results.

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	Field Studies 12. Appropriate and relevant geoclimatic conditions (setting), appropriate application method and rates (exposure) and observation data (biological relevance) to derive endpoints. 13. Well defined test material (including purity/content) 14. Applicable test species 15. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 16. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods and appropriate sampling regime). 17. Study conditions should not differ significantly from recommended protocols, if available for field study. Study conditions should not interfere with the interpretation of the study results

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

CA 9.5 Search methods

Date of initial search	7 October 2014
Date of most recent update to search	30 March 2016
Date span of the search	10 years

Table 9.5-1: Detailed Search Parameters for Ecotoxicological studies (CA 8.1 to 8.15)

Search Strategy
1 Query Profile **Prosulfocarb** L1 QUE SPE=ON ABB=ON PLU=ON (52888-80-9 OR 123780-41-6 OR (PHENYLMETHYL OR BENZYL)(W)DIPROPYLCARBAMOTHIOAT#) L2 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(W)ESTER(W)DIPROPYL(W)CARBAMOTHIOIC(W)ACID OR (BENZYL OR PHENYLMETHYL)(W)ESTER(W)DIPROPYLZHIO(W)CARBAMIC(W)ACID) L3 QUE SPE=ON ABB=ON PLU=ON ((PHENYLMETHYL OR BENZYL)(2W)(DIPROPYLTHIOLCARBAMAT# OR DIPROPYLTHIOCARBAMAT# OR DIPROPYL(W)THIOLCARBAMAT# OR DIPROPYL(W)THIOCARBAMAT#) OR PROSULFOCARB# OR PROSULFUROCARB OR PROSULPHOCARB#) L4 QUE SPE=ON ABB=ON PLU=ON (BENZYLDIPROPYLTHIOCARBAMAT# OR DIPROPYL(W)THIOCARBAMIC(W)ACID(1W)BENZYL(W)ESTER OR PROPYLTHIOCARBAMAT# OR BENZYLDIPROPYL(W)THIOCARBAMAT#) L5 QUE SPE=ON ABB=ON PLU=ON (R(W)15574 OR R15574 OR ICIA0574 OR ICI(W)A0574 OR ICIA(W)0574 OR ICI(1W)0574 OR ICI(1W)574 OR BRN(W)4804364 OR BRN4804364) L6 QUE SPE=ON ABB=ON PLU=ON (SC(W)0574 OR SC0574 OR SC574 OR SC(W)574 OR ARCADE OR ARKADE OR AUROS OR BOXER? OR DEFI OR

Search Strategy

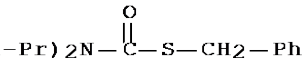
```
                DEFY)
L7              QUE SPE=ON  ABB=ON  PLU=ON  (PESTI!ID? OR HERBI!ID? OR
                WEEDKILLER? OR WEED#(A)KILL? OR WEED#(S)(CONTROL? OR
SUPPRESS?)
                 OR DEFOLIANT OR CROP(W)SAFETY OR SAFENER OR (PLANT OR
                CROP)(S)PROTECT?)
L8              QUE SPE=ON  ABB=ON  PLU=ON  (L6(S)L7)
L9              QUE SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5) OR
L8

Prosulfocarb Metabolites
L10             QUE SPE=ON  ABB=ON  PLU=ON  (51954-81-5 OR SYN521384 OR
                SYN(W)521384 OR R(W)331405 OR R331405 OR (PROSULFOCARB OR
                PROSULPHOCARB)(3A)(SULFOXIDE OR SULPHOXIDE))
L11             QUE SPE=ON  ABB=ON  PLU=ON
(BENZYLSULFINYL(4W)DIPROPYLMETHANAM
                ID# OR PHENYLMETHYL(W)SULFINYL(3W)DIPROPYL(W)FORMAMID#)
L12             QUE SPE=ON  ABB=ON  PLU=ON  (61772-67-6 OR R245699 OR
R(W)24569
                9 OR (2(W)DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID
OR
                2(W)(DIPROPYLCARBAMOYL(W)THIO)(5A)ACETIC(W)ACID OR
S(W)DIPROPYL
                CARBAMOYL(W)MERCAPTOACETIC(W)ACID OR
2(W)DIPROPYLCARBAMOYLSULFA
                NYL(W)ACETIC ACID)
L13             QUE SPE=ON  ABB=ON  PLU=ON
(DIPROPYLCARBAMOYL(W)MERCAPTOACETIC
                (W)ACID OR DIPROPYLCARBAMOYL(W)MERCAPTO(W)ACETIC(W)ACID OR
                (DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID)
L14             QUE SPE=ON  ABB=ON  PLU=ON  (SYN545179 OR SYN(W)545179 OR
                2(W)HYDROXY(W)3(W)PHENYLMETHANESULFINYL(W)(PROPIONIC OR
                PROPANOIC)(W)ACID OR
3(W)BENZYLSULFINYL(W)2(W)HYDROXY(W)(PROPIO
                NIC OR PROPANOIC)(W)ACID)
L15             QUE SPE=ON  ABB=ON  PLU=ON
(HYDROXY(1W)PHENYLMETHANESULFINYL(W
                )(PROPIONIC OR PROPANOIC)(W)ACID OR
BENZYLSULFINYL(1W)HYDROXY(W
                )(PROPIONIC OR PROPANOIC)(W)ACID)
L16             QUE SPE=ON  ABB=ON  PLU=ON  (L10 OR L11 OR L12 OR L13 OR L14
                OR L15)
L17             QUE SPE=ON  ABB=ON  PLU=ON  L9 OR L16
```

2. Prosulfocarb - CAS Registry data as of March 30, 2016

```
L92  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   52888-80-9  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Carbamothioic acid, N,N-dipropyl-, S-(phenylmethyl) ester  (CA INDEX
NAME)
OTHER CA INDEX NAMES:
CN   Carbamic acid, dipropylthio-, S-benzyl ester (7CI)
CN   Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester (9CI)
```

Search Strategy

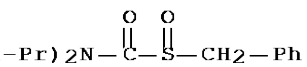
```
OTHER NAMES:
CN   Arkade
CN   Benzyl dipropylthiolcarbamate
CN   Boxer
CN   Boxer (ICI Agrochemicals)
CN   Boxer 800EC
CN   Boxer EC
CN   Defi
CN   Prosulfocarb
CN   R 15574
CN   S-Benzyl dipropylthiocarbamate
CN   S-Benzyl dipropylthiolcarbamate
CN   S-Benzyl N,N-dipropylthiocarbamate
CN   SC 0574
DR   123780-41-6
MF   C14 H21 N O S
CI   COM
SR   CA
LC   STN Files:   BIOSIS, CA, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, CIN,
       IFIALL, MEDLINE, MSDS-OHS, PIRA, REAXYSFILE*, RTECS*, TOXCENTER,
USPAT2,
       USPATFULL, USPATOLD
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

             470 REFERENCES IN FILE CA (1907 TO DATE)
             167 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
             478 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

3. Metabolites - CAS Registry data

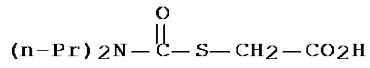
```
CAS Registry data as of October 29, 2015
L93  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   51954-81-5  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Formamide, 1-[(phenylmethyl)sulfinyl]-N,N-dipropyl- (9CI)  (CA INDEX
NAME)
MF   C14 H21 N O2 S
CI   COM
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, USPATFULL
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**
```

Search Strategy

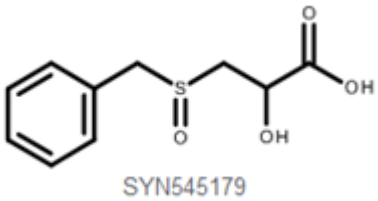
```
               4 REFERENCES IN FILE CA (1907 TO DATE)
               4 REFERENCES IN FILE CAPLUS (1907 TO DATE)


CAS Registry data as of February 5, 2016
L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2016 ACS on STN
RN   61772-67-6  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Acetic acid, 2-[[(dipropylamino)carbonyl]thio]-  (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN   Acetic acid, [[(dipropylamino)carbonyl]thio]- (9CI)
OTHER NAMES:
CN   S-(Dipropylcarbamoyl)mercaptoacetic acid
MF   C9 H17 N O3 S
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, TOXCENTER
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               1 REFERENCES IN FILE CA (1907 TO DATE)
               1 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

4. Metabolites with no CAS Registry data

```
No data available as of February 5, 2016
```



SYN545179

```
SYN545179
CSCD097565
C10H12O4S
2-Hydroxy-3-phenylmethanesulfinyl-propionic acid
3-benzylsulfinyl-2-hydroxy-propanoic acid
```

PLUS

```
L1              QUE  (RIPARIAN? OR REPTILE? OR SNAKE? OR LIZARD?)
L2              QUE  (TORTOISE? OR TURTLE? OR TERRAPIN? OR CROCODIL?)
L3              QUE  (ALLIGATOR? OR CAIMAN? OR GHARIAL? OR HOVERFLIES)
L4              QUE  ((MEADOW#(W)VOLE#) OR PSEUDOKIRSCHNERIELLA)
```

Search Strategy		
L5	QUE	(RHAPHIDOCELIS OR NITZSCHIA OR CYCLOTELLA OR MICROCYSTIS)
L6	QUE	(OSCILLATORIA OR APHANIZOMENON OR ANKISTRODESMUS)
L7	QUE	(TEILINGRIA OR MONORAPHIDIUM OR RADIOCOCCACAE OR TETRASPORALES)
L8	QUE	(TETRAEDRON OR TREUBARIA OR WILLEA OR COSMOCLADIUM)
L9	QUE	(HYPOASPIS OR (SOIL(3A)MICROORGAN?) OR ECHINOCHLOA OR SPARTINA)
L10	QUE	(SALVINIA OR NAJAS OR CALLITRICHE OR MYOSOTIS OR STRATIOTES)
L11	QUE	(HIPPURUS OR PERSICARIA OR CLOEON? OR CORBICULA?)
L12	QUE	(NEOCARIDINIA? OR NEOCARIDINA? OR MYSID? OR CICHLIDAE)
L13	QUE	(CICHLID# OR LEPOMIS? OR SERRANIDAE OR PERCIFORMES)
L14	QUE	(ICTALURUS? OR POECILIA? OR ORYZIAS? OR GASTEROSTEUS?)
L15	QUE	(GASTEROSTEIDAE OR SALVELINUS OR BRACHYDANIO? OR CARASSIUS ?)
L16	QUE	(MISGUMUS? OR CYPRINODON? OR FUNDULUS? OR MISGURNUS?)
L17	QUE	(BREAM OR ROTIFER# OR GAMMARUS OR GAMMARID? OR MAYFLY?)
L18	QUE	(BIVALVE# OR MUSSEL# OR MOLLUSK# OR MOLLUSC# OR BUFO)
L19	QUE	(NEWT# OR SCALLOP# OR CLAM# OR GAMBUSIA OR OREOCHROMIS)
L20	QUE	(OSTRAC? OR TUBIFEX? OR TURBELLARIA OR COPEPODA)
L21	QUE	(PREDACE? OR PREDACI? OR PARASITOID? OR APIS OR APIDAE)
L22	QUE	(BOMBUS OR BOMBINAE OR WORM# OR LUMBRICIDAE OR LUMBRICUS)
L23	QUE	(ALLOBOPHORA? OR DENDROBAENA? OR APORRECTODEA? OR DENDRODRILUS?)
L24	QUE	(EISENIA? OR OCTOLASION? OR (LACE(W)WING#) OR NEUROPTER?)
L25	QUE	(CARABID? OR CARBUS OR STAPHYLINID? OR COCCINEL? OR ADALIA?)
L26	QUE	(STETHORUS? OR SCYMNUS? OR WASP# OR VESPIDAE OR SPHECOIDEA)
L27	QUE	(SPHECIDAE OR STIZIDAE OR OPIUS OR (ICHNEUMON(W)FL?))
L28	QUE	(ICHNEUMONID? OR BRACONID? OR CHALCID? OR CYNIP? OR APHIDI?)
L29	QUE	(EUCOILID? OR IBALIID? OR FIGITID? OR EURYTOM? OR TORYM?)
L30	QUE	(ORYM? OR EUCHARIT? OR PERILAMP? OR PTEROMAL? OR CHRYSOLAMP?)
L31	QUE	(EUPELM? OR ENCYRT? OR SIGNIPHOR? OR APHELIN? OR ELASMID?)
L32	QUE	(ELASMUS OR TETRACAMP? OR MYMAR? OR HELOR? OR PROCTOTRUP?)
L33	QUE	(DIAPRI? OR SCELION? OR PLATYGASTR? OR PLATYGASTER?)
L34	QUE	(CERAPHRON? OR MEGASPIL? OR ARANE? OR OPILION? OR PHALANG?)
L35	QUE	(ARACHNID? OR HARVESTM? OR DADDYLONGLEG? OR (DADDY(W)LONG (W)LEG?))
L36	QUE	((DADDY(W)LONGLEG?) OR COLLEMB? OR (SPRING(W)TAIL?) OR CYDNODROMUS?)
L37	QUE	(PARDOSA? OR ORIUS? OR TYPHLODROM? OR PHYTOSEIULUS? OR SYRPHID?)
L38	QUE	(METASYRPHUS? OR SYRPHUS? OR EUPEODES? OR EPISYRPHUS? OR SYRPHIAN?)
L39	QUE	(EPISTROPHE? OR AMBLYSEIUS? OR POECILUS? OR TRECHUS? OR

Search Strategy

```
                    BEMBIDION?)
L40             QUE  (NEBRIA? OR PTEROSTICHUS? OR CALOSOMA? OR TACHYPORUS? OR
                    NABIDAE?)
L41             QUE  (GEOCORIS? OR HYMENOPT? OR HAEMATOLOECHA? OR CHRYSOPID?
OR
                    SYMPHYTA?)
L42             QUE  (OULEMA? OR APHYTIS? OR BATHYPLECTES? OR LINPHIIDAE? OR
                    LYNPHIIDAE?)
L43             QUE  (LINYPHIIDAE? OR ERIGONE? OR BATHYPHANTES? OR MEIONETA?
OR
                    OEDOTHORAX?)
L44             QUE  (LEPTHYPHANTES? OR LYCOSID? OR LYCOSA? OR CHRYSOPA? OR
                    DACNUSA?)
L45             QUE  (CYRTORHINUS? OR CRYPTOLAEMUS? OR ZETZELLIA? OR
LEPTOMASTIX?)
L46             QUE  (TRICHOGRAMMA? OR ENCARSIA? OR MACROLOPHUS? OR
CHRYSOPERLA?)
L47             QUE  (ALEOCHARA? OR CHRYSOPID# OR CHRYSOPIDAE OR DIABROTICA)
L48             QUE  (PALEXORISTA? OR MAMMAL## OR ANIMAL? OR RABBIT? OR
RODENT#)

L49             QUE  (BLACKBIRD# OR (BLACK(W)BIRD#) OR ((TURDUS OR
T)(W)MERULA))
L50             QUE  (CHAFFINCH? OR ((FRINGILLA OR F)(W)COELEBS) OR
GREENFINCH?)
L51             QUE  (((CARDUELIS OR C)(W)CHLORIS) OR SONGTHRUSH?)
L52             QUE  ((SONG(W)THRUSH?) OR ((TURDUS OR T)(W)PHILOMELOS) OR
WREN#)
L53             QUE  (((TROGLODYTES OR T)(W)TROGLODYTES) OR
(WILLOW(W)WARBLER#))
L54             QUE  (((PHYLLOSCOPUS OR P)(W)TROCHILUS) OR (GREAT(W)TIT#))
L55             QUE  (((PARUS OR P)(W)MAJOR) OR ROBIN# OR GOLDFINCH?)
L56             QUE  (((ERITHACUS OR E)(W)RUBECULA) OR DUNNOCK#)
L57             QUE  (((CARDUELIS OR C)(W)CARDUELIS) OR LINNET#)
L58             QUE  (((PRUNELLA OR P)(W)MODULARIS) OR SKYLARK# OR
(SKY(W)LARK#))
L59             QUE  ((HEDGE(W)(SPARROW# OR ACCENTOR#)))
L60             QUE  (((CARDUELIS OR C)(W)CANNABINA) OR ((ALAUDA OR
A)(W)ARVENSIS))
L61             QUE  ((RED(W)LEGGED(W)PARTRIDGE#) OR ((ALECTORIS OR
A)(W)RUFA))
L62             QUE  ((MEADOW(W)PIPIT#) OR MEADOWPIPIT# OR ((ANTHUS OR A)(W)
                    PRATENSIS))
L63             QUE  (LAPWING# OR ((VANELLUS OR V)(W)VANELLUS) OR PEEWIT#)
L64             QUE  (STARLING# OR ((STURNUS OR S)(W)VULGARIS))
L65             QUE  ((TURTLE(W)DOVE#) OR ((STREPTOPELIA OR S)(W)TURTUR))
L66             QUE  (YELLOWHAMMER# OR (YELLOW(W)HAMMER#) OR
(YELLOW(W)WAGTAIL#))
L67             QUE  (((EMBERIZA OR E)(W)CITRINELLA) OR
(YELLOW(W)WAG(W)TAIL#))
L68             QUE  (((MOTACILLA OR M)(W)FLAVA) OR
(FAN(W)TAILED(W)WARBLER#))
L69             QUE  ((GREY(W)LAG(W)G!!SE) OR ((ANSER OR A)(W)ANSER))
L70             QUE  (REEDBUNTING# OR (REED(W)BUNTING#) OR ((EMBERIZA OR
E)(W)
                    SCHOENICLUS))
L71             QUE  (CHAFFINCH? OR BLUETIT? OR (BLUE(W)TIT?))
```

Search Strategy
L72 QUE (((PARUS OR P)(W)CAERULEUS) OR (SYLVIA(W)COMMUNIS))
L73 QUE (((GALERIDA OR G)(W)CRISTATA) OR (TREE(W)SPARROW#))
L74 QUE (((COTURNIX OR C)(W)COTURNIX) OR (GREY(W)PARTRIDGE#))
L75 QUE (((PERDIX OR P)(W)PERDIX) OR ((PHASIANUS OR P)(W)COLCHICUS))
L76 QUE (((MILIARIA OR M)(W)CALANDRA?) OR GREYLAGG!!SE)
L77 QUE ((GREYLAG(W)G!!SE) OR ((COLUMBA OR C)(W)PALUMBUS?))
L78 QUE (((STREPTOPELIA OR S)(W)(ORIENTALIS? OR RISORIA?)))
L79 QUE (((MOTACILLA OR M)(W)ALBA?) OR (CRESTED(W)LARK#))
L80 QUE ((WHITE(W)WAGTAIL#) OR (WOOD(W)PIGEON#) OR (BIRD(W)LIFE))
L81 QUE ((SONG(W)BIRD#) OR VANELLUS? OR (PEE(W)WIT#))
L82 QUE (AVIFAUNA? OR (AVI(W)FAUNA?) OR SONGBIRD?)
L83 QUE (ORNITHOLOG? OR PASSERINE? OR WOODPIGEON#)
L84 QUE (((PASSER OR P)(W)MONTANUS) OR QUAIL# OR (CALANDRA(W)LARK#))
L85 QUE (CISTICOLA? OR (Z(W)CISTICOLA?) OR BIRDLIFE)
L86 QUE (GEESE OR GOOSE OR SPARROWS OR PIGEONS OR LARK#)
L87 QUE (WARBLER# OR PARTRIDGE# OR BUNTING# OR WAGTAIL#)
L88 QUE (WHITETHROAT# OR PIED# OR (WHITE(W)THROAT#))
L89 QUE ((FORAGING OR FARMLAND OR GRASSLAND)(3A)BIRD#)
L90 QUE (BLUEBIRD# OR (ROCK(W)PTARMIGAN#) OR (BLACK(W)REDSTART#))
L91 QUE ((PREDATOR? OR NONTARGET? OR (NON(W)TARGET))(3A)BIRD#)
L92 QUE ((CORN(W)BUNTING#) OR SERINS OR SERINUS)
L93 QUE (L49 OR L50 OR L51 OR L52 OR L53 OR L54 OR L55 OR L56 OR L 57 OR L58 OR L59 OR L60 OR L61 OR L62 OR L63 OR L64 OR L65 OR L 66 OR L67 OR L68 OR L69 OR L70 OR L71 OR L72 OR L73 OR L74 OR L 75 OR L76 OR L77 OR L78 OR L79 OR L80 OR L81 OR L82 OR L83 OR L 84 OR L85 OR L86 OR L87 OR L88 OR L89 OR L90 OR L91 OR L92)
L94 QUE L93 NOT (JAPANESE? OR JAPONICA?)
L95 QUE (((SMALL OR WILD)(3A)MAMMAL#) OR (WILD(3A)ANIMAL?))
L96 QUE (VOLE# OR GLIS OR DORMOUSE OR DORMICE OR ELIOMY#)
L97 QUE (LEROT# OR LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS?)
L98 QUE (HARE# OR SORICIDAE? OR SOREX? OR NEOMY# OR CROCIDURA?)
L99 QUE (SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS? OR MICROTUS?)
L100 QUE (CLETHRIONOMYS? OR CRICETIDAE? OR MICROTIN?)
L101 QUE (RAPTOR# OR MARMOSET# OR GOPHER# OR GRASSCUTTER#)
L102 QUE ((PREDATOR? OR NONTARGET? OR (NON(W)TARGET?))(3A)MAMMAL#)
L103 QUE ((WOOD(W)(MOUSE OR MICE)) OR ARVICOLA?)
L104 QUE (MEADOW#(W)VOLE#)
L105 QUE (L95 OR L96 OR L97 OR L98 OR L99 OR L100 OR L101 OR L102 OR L103 OR L104)
L106 QUE (ECOTOX? OR LC50 OR ((LC OR EC OR LR)(W)50) OR EC50 OR LR50)
L107 QUE (ECO OR ECOL OR ECOLOG? OR ENV OR ENVIRONM? OR AQUATIC?)
L108 QUE (L107(5A)(TOX? OR RISK? OR IMPACT? OR EFFECT?))
L109 QUE (AQUATIC? OR FRESHWATER? OR (FRESH(W)WATER?))
L110 QUE (FLORA OR FAUNA OR BIOTA OR ORGANISM? OR INSECT?)
L111 QUE (ENVIRONM? OR LIFE OR INVERTEB? OR CRUSTACE? OR SPECIES)

Search Strategy		
L112	QUE	(ENTOMOFAUNA OR (ENTOMO(W)FAUNA))
L113	QUE	(L109(5A)(L110 OR L111 OR L112))
L114	QUE	(MAGNA? OR (D(W)MAGNA?) OR CHIRONOM? OR BRACHIONUS?)
L115	QUE	(LIMNEA? OR CRASSOSTREA? OR ALGA# OR FISH OR FISHES)
L116	QUE	(ONCORHYNCHUS? OR SALMONIDAE? OR CYPRINUS? OR CYPRINID?)
L117	QUE	(PIMEPHALES? OR PISCES OR TROUT OR SUNFISH? OR CARP)
L118	QUE	(MINNOW? OR (F(W)MINNOW?) OR CATFISH? OR ZEBRAFISH?)
L119	QUE	(GOLDFISH? OR (ZEBRA(W)DANIO#) OR GUPPY OR GUPPIES)
L120	QUE	(KILLFISH? OR FATHEAD? OR BLUEGILL? OR SALMON#)
L121	QUE	(THUNDERFISH? OR (WATER(W)(FLY OR FLEA?)) OR WATERFLEA?)
L122	QUE	(FROG# OR AMPHIBIA? OR SHRIMP# OR PRAWN# OR CRAB# OR TOAD#)
L123	QUE	(TADPOLE# OR CRAYFISH? OR SHELLFISH? OR LOBSTER#)
L124	QUE	(OYSTER# OR SNAIL# OR RANA OR RANIDAE? OR PLANKTON?)
L125	QUE	L106 OR L108
L126	QUE	((NONTARGET? OR (NON(W)TARGET?))(5A)(PLANT? OR FLORA?))
L127	QUE	((AQUATIC(3A)(PLANT? OR (PHYTO(W)TOX?) OR PHYTOTOX?)))
L128	QUE	(SEDIMENT? OR HYDROSOIL? OR DUCKWEED? OR PONDWEED?)
L129	QUE	(((DUCK OR POND)(W)WEED#) OR MACROPHYT? OR PERIPHYTON?)
L130	QUE	(POTAMOGETON? OR CHAROPHYTA? OR ELODEA? OR HYDROCHARITA?)
L131	QUE	(CERATOPHYL? OR CHLAMYDOMON? OR SELENASTRUM? OR CHLORELLA?)
L132	QUE	(SCENEDESMUS? OR SKELETONEMA? OR NAVICULA? OR ANABAENA?)
L133	QUE	(MYRIOPHYLLUM? OR GLYCERIA?)
L134	QUE	(NONTARGET? OR (NON(W)TARGET?) OR BENEFICIAL?)
L135	QUE	(EFFECT? OR INVERTEB? OR ORGANISM? OR ARTHROPOD? OR INSECT?)
L136	QUE	(FAUNA OR SPECIES OR (ENTOMO(W)FAUNA?) OR ENTOMOFAUNA?)
L137	QUE	((L134(5A)(L135 OR L136)))
L138	QUE	(PREDAT? OR (NATURAL(W)ENEM?) OR BEE OR BEES OR HONEYBEE#)
L139	QUE	(BUMBLEBEE# OR ((HONEY OR BUMBLE)(W)BEE#) OR EARTHWORM?)
L140	QUE	((EARTH(W)WORM?) OR LADYBUG# OR LADYBEETLE# OR LADYBIRD#)
L141	QUE	((LADY(W)(BUG# OR BEETLE# OR BIRD#)) OR HOVERFLY)
L142	QUE	(HOOVERFLIES OR SAWFLY OR SAWFLIES OR DRONEFLY)
L143	QUE	(DRONEFLIES OR FLOWERFLY OR FLOWERFLIES OR LACEWING?)
L144	QUE	(((HOVER OR DRONE OR FLOWER OR SAW)(W)(FLY OR FLIES)))
L145	QUE	(SPIDER# OR SPRINGTAIL? OR (ROOT(W)WORM#) OR ROOTWORM#)
L146	QUE	(L137 OR L138 OR L139 OR L140 OR L141 OR L142 OR L143 OR L144 OR L145)
L147	QUE	(BIRD? OR AVES OR AVIAN? OR (AVI(W)FAUNA?) OR AVIFAUNA?)
L148	QUE	(SONGBIRD? OR (SONG(W)BIRD?) OR ORNITHOLOG?)
L149	QUE	(L147 OR L148)
L150	QUE	((WILD(3A)(LIFE OR ANIMAL#)) OR WILDLIFE OR SQUIRREL?)
L151	QUE	(VOLE# OR SCIURUS OR GLIRID? OR GLIS OR DORMOUSE)
L152	QUE	(DORMICE OR ELIOMYS OR LEROT# OR MUSTELID? OR MINK#)
L153	QUE	(MUSTELINE# OR WEASEL? OR STOAT? OR MUSTEL? OR BADGER?)
L154	QUE	(MELES OR MELINAE OR OTTER# OR LUTRA OR LUTRINAE)
L155	QUE	(LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS OR HARE#)
L156	QUE	(TALPA OR MOLE OR MOLES OR HEDGEHOG? OR (HEDGE(W)HOG?))
L157	QUE	(CROCIDURA? OR SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS)
L158	QUE	(MICROTUS OR ARVICOLA OR CLETHRIONOMYS? OR CRICETIDAE?)

Search Strategy
L159 QUE (ERINACEUS OR ERINACEIDAE? OR SORICIDAE? OR SOREX) L160 QUE (ENDOCRIN? OR HORMON?) L161 QUE (DISRUPT? OR MIMIC? OR MODULAT? OR DISORDER? OR DISEASE?) L162 QUE (L160(5A)L161) L163 QUE (DAPHNI? OR CERIODAPHNI? OR HYALELLA? OR ASSELLUS) L164 QUE L113 OR (L114 OR L115 OR L116 OR L117 OR L118 OR L119 OR L120 OR L121 OR L122 OR L123 OR L124) OR L163 L165 QUE (PHYTOPLANKTON? OR AUFWUCH# OR LEMNA? OR ARALES OR CHARA) L166 QUE (L126 OR L127 OR L128 OR L129) OR (L130 OR L131 OR L132 OR L133) OR L165 L167 QUE (NEOMYS OR MICROTINAE?) L168 QUE (L150 OR L151 OR L152 OR L153 OR L154 OR L155 OR L156 OR L157 OR L158 OR L159) OR L167 L169 QUE (LOACH? OR STICKLEBACK? OR MUMMICHOG# OR TILAPIA? OR ASELLUS) L170 QUE L164 OR L169 L171 QUE L125 OR L170 OR L166 OR L146 OR L149 OR L168 OR L162 L172 QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41 OR L42 OR L43 OR L44 OR L45 OR L46 OR L47 OR L48) L173 QUE (L171 OR L172 OR L94 OR L105)

Table 9.5-2: Details of Databases Searched and justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	2+1
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		0+1
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0+2
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		0+1
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		4+1
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		7+5
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		26+5

Provider	Database	Justification	Limits applied	Number*
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0+0
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		0+0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0+0
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0+11
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		0+2
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		2+2
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		0+0
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0+0

Provider	Database	Justification	Limits applied	Number*
	HCHEMLIST	The database identifies the regulatory requirements for a specific substance from many of the world's most significant regulated substances lists. It records substance identity information, inventory status, source of information, and summaries of regulatory activity, reports, and other compliance information.		0+0
	CROPU	The database covers all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. The database draws on 1,100 scientific journals, conference proceedings, and patents beginning in 1996. Records contain bibliographic information, titles, abstracts, in-depth indexing, and Enzyme Commission Numbers. Spans the period 1985 to 2003.		0+0
	CROPB	The Crop Protection Backfile is the companion backfile to the current Crop Protection File, CROPU, covering all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. Bibliographic information and indexing terms are searchable. Spans the period 1968 to 1984.		0+0

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	**Number (Initial Search)**	**Number (Top-Up Search)**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	41	31
Number of *summary records* excluded from the search results after rapid assessment for relevance**	36	29
Total number of *full-text* documents assessed in detail*	5	2
Number of *studies* excluded from further consideration after detailed assessment for relevance	5	2
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles

Following exclusion of references from the rapid assessment, the full text was assessed from the remaining 7 titles which were identified as potentially relevant or unclear on the basis of their titles. Full details of these papers are given in the tables below.

Table 9.6-2: List of references for all relevant and unclear studies listed by data point number

CA data point number	Author(s)	Year	Title	Source
Initial search				
8.2.	Arts GHP, Buijse-Bogdan LL,Belgers JDM, van Rhenen-Kersten CH, van Wijngaarden RPA, Roessink I, Maund SJ, van den Brink PJ, Brock TCM	2006	Ecological impact in ditch mesocosms of simulated spray drift from a crop protection program for potatoes.	*Integrated environmental assessment and management* **2**(2): 105-25
8.2.	Rasmussen, JJ, Wiberg-Larsen P, Baattrup-Pedersen A,Monberg RJ,Kronvang B	2012	Impacts of pesticides and natural stressors on leaf litter decomposition in agricultural streams	*Science of the Total Environment* **416**: 148-155
8.2.4	Auber A, Roucaute M, Togola A,Caquet T	2011	Structural and functional effects of conventional and low pesticide input crop-protection programs on benthic macroinvertebrate communities in outdoor pond mesocosms	*Ecotoxicology* **20**(8): 2042-2055
8.2.4	Liess M, von der Ohe PC	2005	Analyzing effects of pesticides on invertebrate communities in streams	*Environmental Toxicology and Chemistry* **24**(4): 954-965
8.3.1	Genersch E, von der Ohe W, Kaatz H, Schroeder A, Otten C, Buchler R, Berg S, Ritter W, Muhlen W, Gisder S, Meixner M, Liebig G, Rosenkranz	2010	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	*Apidologie* **41**(3) 332-352
Top-Up search				
8.1	Bro E, Millot F, Decors A, Devillers J	2015	Quantification of potential exposure of Gray partridge (*Perdix perdix*) to pesticide active substances in farmlands	*Science of the Total Environment* **521**:315-325
8.2.4	Muenze, R, Orlinskiy P, Gunold R, Paschke A, Kaske O, Beketov MA, Hundt M, Bauer C, Schuurmann G, Moder M, Liess M	2015	Pesticide impact on aquatic invertebrates identified with Chemcatcher® passive samplers and $SPEAR_{pesticides}$ index	*Science of the Total Environment* **537**:69-80

Table 9.6-3: List of references for all relevant and unclear studies listed by Author

Author(s)	Year	CA data point number	Title	Source
Initial Search				
Arts GHP, Buijse-Bogdan LL,Belgers JDM, van Rhenen-Kersten CH, van Wijngaarden RPA, Roessink I, Maund SJ, van den Brink PJ, Brock TCM	2006	8.2	Ecological impact in ditch mesocosms of simulated spray drift from a crop protection program for potatoes.	*Integrated environmental assessment and management* **2**(2): 105-25
Auber A, Roucaute M, Togola A,Caquet T	2011	8.2.4	Structural and functional effects of conventional and low pesticide input crop-protection programs on benthic macroinvertebrate communities in outdoor pond mesocosms	*Ecotoxicology* **20**(8): 2042-2055
Genersch E, von der Ohe W, Kaatz H, Schroeder A, Otten C, Buchler R, Berg S, Ritter W, Muhlen W, Gisder S, Meixner M, Liebig G, Rosenkranz	2010	8.3.1	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	*Apidologie* **41**(3) 332-352
Liess M, von der Ohe PC	2005	8.2.4	Analyzing effects of pesticides on invertebrate communities in streams	*Environmental Toxicology and Chemistry* **24**(4): 954-965
Rasmussen, JJ, Wiberg-Larsen P, Baattrup-Pedersen A,Monberg RJ,Kronvang B	2012	8.2.	Impacts of pesticides and natural stressors on leaf litter decomposition in agricultural streams	*Science of the Total Environment* **416**: 148-155
Top-Up search				
Bro E, Millot F, Decors A, Devillers J	2015	8.1	Quantification of potential exposure of Gray partridge (*Perdix perdix*) to pesticide active substances in farmlands	*Science of the Total Environment* **521**:315-325
Muenze, R, Orlinskiy P, Gunold R, Paschke A, Kaske O, Beketov MA, Hundt M, Bauer C, Schuurmann G, Moder M, Liess M	2015	8.2.4	Pesticide impact on aquatic invertebrates identified with Chemcatcher® passive samplers and $SPEAR_{pesticides}$ index	*Science of the Total Environment* **537**:69-80

A detailed review of the full-text documents identified in Table 9.6-2 resulted in the additional exclusion of the following studies from the dossier.

Table 9.6-4: List of references excluded following detailed review listed by data point number

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
Initial search					
8.2.	Arts GHP, Buijse-Bogdan LL,Belgers JDM, van Rhenen-Kersten CH, van Wijngaarden RPA, Roessink I, Maund SJ, van den Brink PJ, Brock TCM	2006	Ecological impact in ditch mesocosms of simulated spray drift from a crop protection program for potatoes.	*Integrated environmental assessment and management* **2**(2): 105-25	17 Study conditions differ significantly from recommended protocols - mixture of PPPs applied to mesocosm, effects of Prosulfocarb alone could only be assessed for 2 weeks (prior to application of 2nd PPP in programme)
8.2.	Rasmussen, JJ, Wiberg-Larsen P, Baattrup-Pedersen A,Monberg RJ,Kronvang B	2012	Impacts of pesticides and natural stressors on leaf litter decomposition in agricultural streams	*Science of the Total Environment* **416**: 148-155	13 Not a well defined test material (including purity/content) – descriptive study with measurement of prosulfocarb in river water, along with panel of other pesticides. Confounded wrt any effect of prosulfocarb
8.2.4	Auber A, Roucaute M, Togola A,Caquet T	2011	Structural and functional effects of conventional and low pesticide input crop-protection programs on benthic macroinvertebrate communities in outdoor pond mesocosms	*Ecotoxicology* **20**(8): 2042-2055	12. Not an appropriate application method and rate (exposure) – multiple PPPs applied to mimic a crop protection program. Ability to assess effects of Prosulfocarb confounded by presence of other PPPs
8.2.4	Liess M, von der Ohe PC	2005	Analyzing effects of pesticides on invertebrate communities in streams	*Environmental Toxicology and Chemistry* **24**(4): 954-965	13 Not a well-defined test material (including purity/content) – descriptive field study with measurement of prosulfocarb in river water, along with panel of other pesticides. Confounded wrt any effect of prosulfocarb
8.3.1	Genersch E, von der Ohe W, Kaatz H, Schroeder A, Otten C, Buchler R, Berg S, Ritter W, Muhlen W, Gisder S, Meixner M, Liebig G, Rosenkranz	2010	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	*Apidologie* **41**(3) 332-352	13 Not a well-defined test material (including purity/content) – descriptive field study with measurement of prosulfocarb in bee bread, along with panel of other pesticides. Confounded wrt any effect of prosulfocarb

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
Top-Up search					
8.1	Bro E, Millot F, Decors A, Devillers J	**2015**	Quantification of potential exposure of Gray partridge (*Perdix perdix*) to pesticide active substances in farmlands	*Science of the Total Environment* **521**:315-325	13 Not a well-defined test material (including purity/content) – estimation of potential exposure to PPPs using crop management information from farmers – no actual quantification of exposure to prosulfocarb or any other PPP
8.2.4	Muenze, R, Orlinskiy P, Gunold R, Paschke A, Kaske O, Beketov MA, Hundt M, Bauer C, Schuurmann G, Moder M, Liess M	2015	Pesticide impact on aquatic invertebrates identified with Chemcatcher® passive samplers and $SPEAR_{pesticides}$ index	*Science of the Total Environment* **537**:69-80	13 Not a well-defined test material (including purity/content) – descriptive field study with measurement of PPPs using passive accumulation devices. Prosulfocarb not detected

All documents listed in Table 9.6-2 were assessed in detail and have been excluded i.e. listed in Table 9.6-4 as not relevant to the ecotoxicology endpoints for prosulfocarb and have therefore not been discussed further.

Prosulfocarb

NOTIFICATION OF AN ACTIVE SUBSTANCE UNDER COMMISSION REGULATION (EU) 844/2012

DOCUMENT M-CA, Section 9

Fate and Behaviour in the Environment

LITERATURE DATA

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for prosulfocarb, its relevant metabolite(s) and the EU representative formulation A8545G (BOXER®).

CA 9.2 Author(s) of the review

Syngenta
Jealott's Hill International Research Centre
Bracknell
Berkshire
RG42 6EY
UK

CA 9.3 Summary: A brief summary indicating the purpose of the report, the methodology employed and the results obtained

This report summarises the search for "scientific peer-reviewed open literature on prosulfocarb and its potentially relevant metabolites(s) dealing with fate and behaviour data which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The exact search strategy is detailed in Tables 9.5-1 to -5 but a summary of the methodology employed is given below.

1. A very broad search was conducted in 18 scientific source databases (detailed in Table 9.5-2) for prosulfocarb and its metabolites or its representative formulation, using the names summarised below, in conjunction with any of the key words set out in Table 9.5-1.
2. Duplicates titles from between the data bases were automatically removed from the output.
3. A rapid assessment of the titles was conducted to remove any additional duplicates and any obviously irrelevant titles (where enough information was available from the title alone).
4. A further rapid assessment was conducted using summary abstracts and any clearly irrelevant titles were removed.
5. A detailed assessment of the full-text documents for the remaining titles was conducted using the criteria developed for study relevance (see Table 9.4.2-1).
6. Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below and further details are provided in Section 9.5.

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	132	70
Number of *summary records* excluded from the search results after rapid assessment for relevance**	127	70
Total number of *full-text* documents assessed in detail*	5	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	5	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

The review has the objective of identifying "scientific peer-reviewed open literature on active substance prosulfocarb and its potentially relevant metabolites(s) dealing with fate and behaviour data which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

CA 9.4.2 Criteria for relevance with which decisions to select studies in the dossier were made

Table 9.4.2-1: List of Criteria for relevance for each data requirement

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Route and rate of degradation in soil – Laboratory Studies – aerobic and anaerobic, parent and metabolites CA 7.1.1 CA 7.1.1.1 CA 7.1.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 307) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols e.g. temperature and moisture 6. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 7. Sufficient number of samples taken to determine kinetics (minimum 5) 8. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 9. Analytical method well described, LOD/LOQ at appropriate level 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 11. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 12. Identification of 'new' metabolites is robust with appropriate details of method used 13. Anaerobic conditions are verified by measurement

Route and rate of degradation in soil – Field Studies CA 7.1.2.2	1. In addition to criteria under laboratory route and rate: 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate weather data available to verify relevance of study 4. Application technique relevant to proposed use (foliar, ST granule etc) 5. Sufficient sampling detail and description of sample handling prior to analysis 6. Initial and procedural recoveries are adequate to support the conclusions, e.g. 70-120%.
Soil photolysis CA 7.1.1.3	In addition to criteria under laboratory route and rate: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Mobility studies Adsorption, desorption – parent and metabolites CA 7.1.3 Column or TLC leaching CA 7.1.4.1.1, CA 7.1.4.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 106) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols 6. Application rate is appropriate to the proposed use and can be verified from the data 7. Sufficient number of samples taken to determine isotherm (if done) 8. Stability of the test item in the system was demonstrated 9. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Analytical method well described, LOD/LOQ at appropriate level 12. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Lysimeter studies CA 7.1.4.2	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data available to verify relevance of study. Combined rainfall/irrigation sufficient to meet guideline requirements 3. Minimum 1 m depth soil monolith 4. Study continued for sufficient years to support the conclusions
Field leaching CA 7.1.4.3.	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data and groundwater data (depth, direction) available to verify the validity of study 3. Installation and operation of lysimeters and/or wells and samplers follows recommended protocols 4. Study continued for sufficient years to support the conclusions
Hydrolysis CA 7.2.1	1. Well defined test material (including purity/content) 2. Experimental conditions should not differ significantly from recommended protocols 3. Application rate is within an acceptable the range (e.g. consider solubility) and can be verified from the data (time zero samples) 4. Sufficient number of samples taken to determine kinetics (minimum 5) 5. Analytical method well described, LOD/LOQ at appropriate level

	6. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 7. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 8. Identification of 'new' metabolites is robust with appropriate details of method used
Aqueous photolysis CA 7.2.1.2	In addition to criteria under hydrolysis: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Degradation in aquatic systems CA 7.2.2	1. Well defined test material (including purity/content) 2. Water(s) and sediment(s) must be from an agricultural area and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 308) 3. Water/sediment collection, preparation and storage do not differ significantly from recommended protocols 4. Experimental conditions do not differ significantly from recommended protocols e.g. temperature and aeration 5. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 6. Sufficient number of samples taken to determine kinetics (minimum 5) 7. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 8. Analytical method well described, LOD/LOQ at appropriate level 9. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Identification of 'new' metabolites is robust with appropriate details of method used 12. Anaerobic conditions are verified by measurement
Degradation in the saturated zone CA 7.2.3	1. For laboratory studies refer to criteria under laboratory route and rate 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate site characterisation data available e.g. soils, geology, hydrology 4. Installation of samplers e.g. wells, lysimeters follows recommended protocols 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Route and rate of degradation in air CA 7.3.1	1. Experimental conditions or calculations differ significantly from recommended protocols 2. Analytical method well described, LOD/LOQ at appropriate level 3. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Monitoring CA 7.5	1. Site(s) or areas must be geoclimatically relevant for the EU 2. Adequate site characterisation data available e.g. soils, geology, hydrology 3. Installation of samplers e.g. wells, lysimeters follows recommended protocols OR adequate description of wells is available (depth of well, length of screen, depth of screen opening, depth of groundwater)

	4. Appropriate sampling methodology. 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. suitable blank controls included 7. For surface water: description of sampling methodology and handling of detects (peaks, interpolated time-step?), linked to rainfall intensity and volume). Discharge volumes, catchment drained area.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

CA 9.5 Search methods

Date of initial search	7 October 2014
Date of most recent update to search	30 March 2016
Date span of the search	10 years

Table 9.5-1: Detailed Search Parameters for fate and behaviour in the environment (CA 7.1 to 7.12)

Search Strategy

1 Query Profile

Prosulfocarb

```
L1              QUE SPE=ON  ABB=ON  PLU=ON  (52888-80-9 OR 123780-41-6 OR
                (PHENYLMETHYL OR BENZYL)(W)DIPROPYLCARBAMOTHIOAT#)
L2              QUE SPE=ON  ABB=ON  PLU=ON  ((PHENYLMETHYL OR
BENZYL)(W)ESTER(W
                )DIPROPYL(W)CARBAMOTHIOIC(W)ACID OR (BENZYL OR
PHENYLMETHYL)(W)
                ESTER(W)DIPROPYLZHIO(W)CARBAMIC(W)ACID)
L3              QUE SPE=ON  ABB=ON  PLU=ON  ((PHENYLMETHYL OR
BENZYL)(2W)(DIPRO
                PYLTHIOLCARBAMAT# OR DIPROPYLTHIOCARBAMAT# OR
DIPROPYL(W)THIOLC
                ARBAMAT# OR DIPROPYL(W)THIOCARBAMAT#) OR PROSULFOCARB# OR
                PROSULFUROCARB OR PROSULPHOCARB#)
L4              QUE SPE=ON  ABB=ON  PLU=ON  (BENZYLDIPROPYLTHIOCARBAMAT# OR
                DIPROPYL(W)THIOCARBAMIC(W)ACID(1W)BENZYL(W)ESTER OR
PROPYLTHIOC
                ARBAMAT# OR BENZYLDIPROPYL(W)THIOCARBAMAT#)
L5              QUE SPE=ON  ABB=ON  PLU=ON  (R(W)15574 OR R15574 OR ICIA0574
                OR ICI(W)A0574 OR ICIA(W)0574 OR ICI(1W)0574 OR ICI(1W)574 OR
                BRN(W)4804364 OR BRN4804364)
L6              QUE SPE=ON  ABB=ON  PLU=ON  (SC(W)0574 OR SC0574 OR SC574 OR
                SC(W)574 OR ARCADE OR ARKADE OR AUROS OR BOXER? OR DEFI OR
                DEFY)
L7              QUE SPE=ON  ABB=ON  PLU=ON  (PESTI!ID? OR HERBI!ID? OR
                WEEDKILLER? OR WEED#(A)KILL? OR WEED#(S)(CONTROL? OR
SUPPRESS?)
                 OR DEFOLIANT OR CROP(W)SAFETY OR SAFENER OR (PLANT OR
                CROP)(S)PROTECT?)
L8              QUE SPE=ON  ABB=ON  PLU=ON  (L6(S)L7)
L9              QUE SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5) OR
L8
```

Search Strategy

Prosulfocarb Metabolites

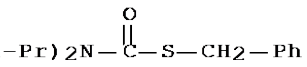
```
L10             QUE SPE=ON  ABB=ON  PLU=ON  (51954-81-5 OR SYN521384 OR
                SYN(W)521384 OR R(W)331405 OR R331405 OR (PROSULFOCARB OR
                PROSULPHOCARB)(3A)(SULFOXIDE OR SULPHOXIDE))
L11             QUE SPE=ON  ABB=ON  PLU=ON
(BENZYLSULFINYL(4W)DIPROPYLMETHANAM
                ID# OR PHENYLMETHYL(W)SULFINYL(3W)DIPROPYL(W)FORMAMID#)
L12             QUE SPE=ON  ABB=ON  PLU=ON  (61772-67-6 OR R245699 OR
R(W)24569
                9 OR (2(W)DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID
OR
                2(W)(DIPROPYLCARBAMOYL(W)THIO)(5A)ACETIC(W)ACID OR
S(W)DIPROPYL
                CARBAMOYL(W)MERCAPTOACETIC(W)ACID OR
2(W)DIPROPYLCARBAMOYLSULFA
                NYL(W)ACETIC ACID)
L13             QUE SPE=ON  ABB=ON  PLU=ON
(DIPROPYLCARBAMOYL(W)MERCAPTOACETIC
                (W)ACID OR DIPROPYLCARBAMOYL(W)MERCAPTO(W)ACETIC(W)ACID OR
                (DIPROPYLAMINO(W)CARBONYL(W)THIO)(5A)ACETIC(W)ACID)
L14             QUE SPE=ON  ABB=ON  PLU=ON  (SYN545179 OR SYN(W)545179 OR
                2(W)HYDROXY(W)3(W)PHENYLMETHANESULFINYL(W)(PROPIONIC OR
                PROPANOIC)(W)ACID OR
3(W)BENZYLSULFINYL(W)2(W)HYDROXY(W)(PROPIO
                NIC OR PROPANOIC)(W)ACID)
L15             QUE SPE=ON  ABB=ON  PLU=ON
(HYDROXY(1W)PHENYLMETHANESULFINYL(W
                )(PROPIONIC OR PROPANOIC)(W)ACID OR
BENZYLSULFINYL(1W)HYDROXY(W
                )(PROPIONIC OR PROPANOIC)(W)ACID)
L16             QUE SPE=ON  ABB=ON  PLU=ON  (L10 OR L11 OR L12 OR L13 OR L14
                OR L15)
L17             QUE SPE=ON  ABB=ON  PLU=ON  L9 OR L16
```

2. Prosulfocarb - CAS Registry data as of March 30, 2016

```
L92  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   52888-80-9  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Carbamothioic acid, N,N-dipropyl-, S-(phenylmethyl) ester  (CA INDEX
NAME)
OTHER CA INDEX NAMES:
CN   Carbamic acid, dipropylthio-, S-benzyl ester (7CI)
CN   Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester (9CI)
OTHER NAMES:
CN   Arkade
CN   Benzyl dipropylthiolcarbamate
CN   Boxer
CN   Boxer (ICI Agrochemicals)
CN   Boxer 800EC
CN   Boxer EC
CN   Defi
CN   Prosulfocarb
CN   R 15574
```

Search Strategy

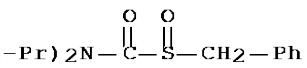
```
CN   S-Benzyl dipropylthiocarbamate
CN   S-Benzyl dipropylthiolcarbamate
CN   S-Benzyl N,N-dipropylthiocarbamate
CN   SC 0574
DR   123780-41-6
MF   C14 H21 N O S
CI   COM
SR   CA
LC   STN Files:   BIOSIS, CA, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, CIN,
       IFIALL, MEDLINE, MSDS-OHS, PIRA, REAXYSFILE*, RTECS*, TOXCENTER,
USPAT2,
       USPATFULL, USPATOLD
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

             470 REFERENCES IN FILE CA (1907 TO DATE)
             167 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
             478 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

3. Metabolites - CAS Registry data

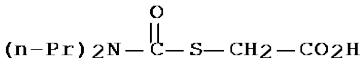
```
CAS Registry data as of October 29, 2015
L93  ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2015 ACS on STN
RN   51954-81-5  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Formamide, 1-[(phenylmethyl)sulfinyl]-N,N-dipropyl- (9CI)  (CA INDEX
NAME)
MF   C14 H21 N O2 S
CI   COM
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, USPATFULL
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               4 REFERENCES IN FILE CA (1907 TO DATE)
               4 REFERENCES IN FILE CAPLUS (1907 TO DATE)


CAS Registry data as of February 5, 2016
L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2016 ACS on STN
RN   61772-67-6  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Acetic acid, 2-[[(dipropylamino)carbonyl]thio]-  (CA INDEX NAME)
OTHER CA INDEX NAMES:
```

Search Strategy

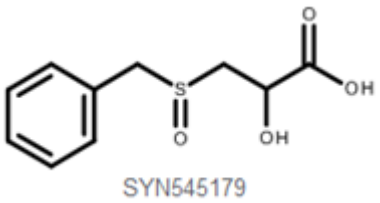
```
CN   Acetic acid, [[(dipropylamino)carbonyl]thio]- (9CI)
OTHER NAMES:
CN   S-(Dipropylcarbamoyl)mercaptoacetic acid
MF   C9 H17 N O3 S
SR   CA
LC   STN Files:   CA, CAPLUS, REAXYSFILE*, TOXCENTER
         (*File contains numerically searchable property data)
```



```
**PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT**

               1 REFERENCES IN FILE CA (1907 TO DATE)
               1 REFERENCES IN FILE CAPLUS (1907 TO DATE)
```

4. Metabolites with no CAS Registry data

No data available as of February 5, 2016



SYN545179

SYN545179
CSCD097565
C10H12O4S
2-Hydroxy-3-phenylmethanesulfinyl-propionic acid
3-benzylsulfinyl-2-hydroxy-propanoic acid

plus

L1 QUE (FATE# OR DEGRAD? OR PERSIST? OR DECOMP? OR DECAY?)
L2 QUE (TRANSFORM? OR DETERIORAT? OR METAB? OR DEGENERAT?)
L3 QUE (BIODEGRAD? OR BIOTRANSFORM? OR BIODETERIORAT?)
L4 QUE (BIODEGENERAT? OR BREAKDOWN? OR BREAKSDOWN?)
L5 QUE (((BROKEN? OR BREAK?)(W)(UP OR DOWN)) OR HALFLIFE#)
L6 QUE (HALFLIVES OR HALF(W)(LIFE OR LIVES) OR DEGRDN# OR DECOMPN#)
L7 QUE (BIODEGRDN# OR DEGN# OR BIODEGN# OR DISSIP? OR RESIDUE?)
L8 QUE (LEACH? OR TRANSPORT? OR MOBIL? OR MOVEMENT? OR HYDROLY?)
L9 QUE (ADSORP? OR ADSORB? OR SORP? OR SORB? OR DESORP?)
L10 QUE (DESORB? OR RUNOFF OR (RUN#(W)OFF) OR DRAIN? OR PERCOLAT?)
L11 QUE (WASHOFF? OR WASHOUT? OR (WASH?(W)(OUT OR OFF)))
L12 QUE ((((OFF(W)TARGET) OR LATERAL OR HORIZONTAL)(3W)MOVE?))
L13 QUE (PHOTOLY? OR PHOTODEGRAD? OR PHOTODECOMP?)

Search Strategy	
L14	QUE (PHOTOTRANSFORM? OR PHOTOSTAB? OR PHOTODEGRDN# OR PHOTODEGN#)
L15	QUE ((PHOTO(W)(DECOMP? OR DEGRAD? OR TRANSFORM? OR STAB? OR CHEM?)))
L16	QUE (PHOTOCHEM? OR VOLATIL? OR VAPOUR? OR VAPOR? OR DT50 OR DT90)
L17	QUE ((DT(W)50) OR (DT(W)90) OR KDOC OR (K(W)DOC) OR KD OR KOC)
L18	QUE ((K(W)OC) OR (PARTITION?(3W)COEFF?) OR FREUNDLICH)
L19	QUE (SEDIMENT? OR SOIL OR SOILS OR PODZOL? OR CLAY? OR SAND?)
L20	QUE (SILT? OR CHERNOZEM? OR PODSOL? OR LOAM? OR PEAT?)
L21	QUE ((ORGANIC(2W)MATTER?) OR MONTMORIL? OR LATOSOL? OR HUMIC?)
L22	QUE (HUMUS? OR SUBSOIL? OR AIR OR WATER? OR ATMOSPHER?)
L23	QUE (RAIN### OR RAINWATER? OR RAINFALL? OR LEACH?)
L24	QUE (GROUNDWATER? OR ENVIRONMENT? OR PRECIPITAT? OR POND#)
L25	QUE (STREAM# OR RIVER# OR DELTA# OR ESTUAR? OR SEDIMENT?)
L26	QUE (AQUATIC? OR MARINE? OR TIDAL? OR BENTHIC? OR LAKE#)
L27	QUE (BENTHOS? OR LIMNO? OR FRESHWATER? OR SEAWATER?)
L28	QUE (SALTWATER? OR ((GROUND? OR FRESH OR SEA OR SALT)(W)WATER?))
L29	QUE (LACUSTRINE? OR MIRE OR MIRES OR RESERVOIR# OR CANAL#)
L30	QUE (LOCH# OR SEA OR OCEAN OR OCEANS OR LAGOON? OR SEAS)
L31	QUE (SEABED OR SEAFLOOR OR INTERTIDAL? OR SHORE? OR COAST?)
L32	QUE (BRACKISH OR LITTORAL? OR SEASHORE? OR MEIOBENTH?)
L33	QUE (MICROBENTH? OR MACROBENTH? OR HARBOUR# OR FLUVIAL?)
L34	QUE (MARSH? OR BOG OR BOGS OR SWAMP? OR FEN OR FENS OR ALLUVI?)
L35	QUE (MUDFLAT? OR (MUD(W)FLAT?) OR BAY OR BAYS OR CREEK#)
L36	QUE (HYDROSOIL# OR (HYDRO(W)SOIL#) OR MESOCOSM? OR MICROCOSM?)
L37	QUE (WETLAND? OR FENLAND? OR ((WET OR FEN)(W)LAND?))
L38	QUE (WATERWAY? OR WATERSHED? OR (WATER(W)(WAY? OR SHED?)))
L39	QUE (CATCHMENT? OR DITCH? OR DRAIN# OR DRAINAG?)
L40	QUE (((FOLIAGE OR FOLIAR OR LEAF OR LEAVES)(5A)EVAPORAT?))
L41	QUE ((SPRAY? OR DUST?)(3A)DRIFT)
L42	QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41)

Table 9.5-2: Detailed Search Parameters for Fate and behaviour in the environment (CA 7.1 to 7.12)

Provider	Database	Justification	Limits applied	Number* (Top Up)
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	4 (2)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		2 (1)
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		1 (3)
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		0 (2)
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		7 (1)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		22 (12)
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		91 (12)

Provider	Database	Justification	Limits applied	Number* (Top Up)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		1 (0)
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		0 (0)
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0 (0)
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (25)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		1 (4)
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		1 (6)
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		2 (2)
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0 (0)

Provider	Database	Justification	Limits applied	Number* (Top Up)
	HCHEMLIST	The database identifies the regulatory requirements for a specific substance from many of the world's most significant regulated substances lists. It records substance identity information, inventory status, source of information, and summaries of regulatory activity, reports, and other compliance information.		0 (0)
	CROPU	The database covers all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. The database draws on 1,100 scientific journals, conference proceedings, and patents beginning in 1996. Records contain bibliographic information, titles, abstracts, in-depth indexing, and Enzyme Commission Numbers. Spans the period 1985 to 2003.		0 (0)
	CROPB	The Crop Protection Backfile is the companion backfile to the current Crop Protection File, CROPU, covering all aspects of pesticides, including their use in crop protection and pest control. Information on plant and insect growth regulators, attractants, repellents and biological control is also included. Bibliographic information and indexing terms are searchable. Spans the period 1968 to 1984.		0 (0)

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 9.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	Number (Initial Search)	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	132	70
Number of *summary records* excluded from the search results after rapid assessment for relevance**	127	70
Total number of *full-text* documents assessed in detail	5	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	5	0

*both from bibliographic databases and other sources of peer-reviewed literature
**aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles

Following exclusion of references from the rapid assessment, the full text was assessed from the remaining title which was identified as potentially relevant or unclear on the basis of their titles. Full details of these papers are given in the tables below.

Table 9.6-2: List of references for all relevant and unclear studies listed by data point number

Reference ID	CA data point number	Author(s)	Year	Title	Source
Initial search					
1	7.1.3.1.1	Michele NEGRE, Iride PASSARELLA, Carlotta BOURSIER, Chiara MOZZETTI, Mara GENNARI	2006	Evaluation of the bioavailability of the herbicide prosulfocarb through adsorption on soils and model soil colloids, and through a simple bioassay	Pest Management Science 62 (2006): 957-964
2	7.3.1	S.C.K. CARLSEN, N.H.SPLIID, B. SVENSMARK	2006	Drift of 10 herbicides after tractor spray application. 1. Secondary drift (evaporation)	Chemosphere 64 (2006): 787-794
3	7.3.1	Anette Ravn JENSEN, Niels Henrik SPLIID, Bo SVENSMARK	2007	Determination of volatilisation (dissipation) and secondary deposition of pesticides in a field study using passive dosimeters	International Journal of Environmental Analytical Chemistry 87:13-14, 913-926
4	7.5	Bengt-Olov LINDQVIST, Jan-Bertil HANSSON, Christina JONSSON, Kenneth PERSSON	2007	Monitoring of pesticides in rawwater wells in Simrishamn	Vatten 63 (2007):159-163
5	7.5	Fabrizio BOTTA, Nils FAUCHON, Helene BLANCHOUD, Marc CHEVREUIL, Benedicte GUERY	2012	Phyt'Eaux Cités: Application and validation of a programme to reduce surface water contamination with urban pesticides	Chemosphere 86 (2012): 166-176
Top-Up search					
		None			

Table 9.6-3: List of references for all relevant and unclear studies listed by Author

Reference ID	Author(s)	Year	OECD data point number	Title	Source
Initial Search					
5	Fabrizio BOTTA, Nils FAUCHON, Helene BLANCHOUD, Marc CHEVREUIL, Benedicte GUERY	2012	7.5	Phyt'Eaux Cités: Application and validation of a programme to reduce surface water contamination with urban pesticides	Chemosphere 86 (2012): 166-176
2	S.C.K. CARLSEN, N.H.SPLIID, B. SVENSMARK	2006	7.3.1	Drift of 10 herbicides after tractor spray application. 1. Secondary drift (evaporation)	Chemosphere 64 (2006): 787-794
3	Anette Ravn JENSEN, Niels Henrik SPLIID, Bo SVENSMARK	2007	7.3.1	Determination of volatilisation (dissipation) and secondary deposition of pesticides in a field study using passive dosimeters	International Journal of Environmental Analytical Chemistry 87:13-14, 913-926
4	Bengt-Olov LINDQVIST, Jan-Bertil HANSSON, Christina JONSSON, Kenneth PERSSON	2007	7.5	Monitoring of pesticides in rawwater wells in Simrishamn	Vatten 63 (2007):159-163
1	Michele NEGRE, Iride PASSARELLA, Carlotta BOURSIER, Chiara MOZZETTI, Mara GENNARI	2006	7.1.3.1.1	Evaluation of the bioavailability of the herbicide prosulfocarb through adsorption on soils and model soil colloids, and through a simple bioassay	Pest Management Science 62 (2006): 957-964
Top-Up search					
	None				

The documents listed in Table 9.6-2 were not excluded during detailed assessment and so have been provided in Document K and summarised in the relevant Document MCA where an assessment of reliability has been conducted and the conclusions documented.

Detailed re-assessment and reliability evaluation by applicant (Syngenta Japan) in 2022

1. Detailed re-assessment

Detailed re-assessment was conducted in accordance with Japanese criteria in 2022 for five studies considered relevant in 2016. As the result, two of the five studies were considered not relevant and three were classified as “Category a” or “Category c”.

Table 1-1: List of references considered not relevant following detailed re-assessment in accordance with Japanese criteria

Ref. ID	CA data point number	Author(s)	Year	Title	Source	Reason(s) for Non-relevance
4	7.5	Bengt-Olov LINDQVIST, Jan-Bertil HANSSON, Christina JONSSON, Kenneth PERSSON	2007	Monitoring of pesticides in rawwater wells in Simrishamn	Vatten 63 (2007):159-163	Monitoring of 77 pesticides in the groundwater wells in Simrishamn in Sweden. The monitoring data in Sweden is not relevant for the risk assessment in Japan.
5	7.5	Fabrizio BOTTA, Nils FAUCHON, Helene BLANCHOUD, Marc CHEVREUIL, Benedicte GUERY	2012	Phyt’Eaux Cités: Application and validation of a programme to reduce surface water contamination with urban pesticides	Chemosphere 86 (2012): 166-176	3-year monitoring of pesticides in the surface water of Orge River in France. The monitoring data in France is not relevant for the risk assessment in Japan.

Table 1-2: List of references considered relevant and the categorization

Ref. ID	CA data point number	Author(s)	Year	Title	Source	Categorization & comments
1	7.1.3.1.1	Michele NEGRE, Iride PASSARELLA, Carlotta BOURSIER, Chiara MOZZETTI, Mara GENNARI	2006	Evaluation of the bioavailability of the herbicide prosulfocarb through adsorption on soils and model soil colloids, and through a simple bioassay	Pest Management Science 62 (2006): 957-964	Category a: Adsorption isotherms of prosulfocarb were determined on 20 soils with different physicochemical properties.

Ref. ID	CA data point number	Author(s)	Year	Title	Source	Categorization & comments
2	7.3.1	S.C.K. CARLSEN, N.H.SPLIID, B. SVENSMARK	2006	Drift of 10 herbicides after tractor spray application. 1. Secondary drift (evaporation)	Chemosphere 64 (2006): 787-794	Category c: The evaporation of 10 herbicides was investigated in five field experiments (one including prosulfocarb application). A statistically significant evaporation of prosulfocarb (80%) was found within 24 h. The experiment shows that even compounds with relatively low vapour pressures may dissipate. Field studies are not required in Japan to investigate evaporation property.
3	7.3.1	Anette Ravn JENSEN, Niels Henrik SPLIID, Bo SVENSMARK	2007	Determination of volatilisation (dissipation) and secondary deposition of pesticides in a field study using passive dosimeters	International Journal of Environmental Analytical Chemistry 87:13-14, 913-926	Category c: The volatilisation and secondary deposition of prosulfocarb was measured using passive dosimeters with Chinese cabbage and soil as collective material. The volatilisation of prosulfocarb determined as dissipation was 81% of the applied amount from the cabbage surface, while no significant loss was measured from soil surfaces after 48 h. Field studies are not required in Japan to investigate evaporation property.

2. Study summary and reliability evaluation

A summary of the study classified “Category a” (Ref. ID: 1) is shown below. The reliability evaluation was conducted with Klimisch code (Klimisch, 1997) in accordance with No.30-syouan-6278 (MAFF, 2021) and OECD Test No. 106 (OECD, 2000). The reliability of the study was scored “Klimisch 3”.

Report:	K-CA 7.1.3.1.1/02 Negre M. *et al.* (2006). Evaluation of the bioavailability of the herbicide prosulfocarb through adsorption on soils and model soil colloids, and through a simple bioassay. Pest Management Science 62:957–964 (Syngenta File No. ICI574_10256).

Guidelines: Not specified.

GLP: No

Executive summary

Adsorption isotherms of prosulfocarb were determined on soils with different physicochemical properties. The extent of adsorption increased with the organic carbon content, but the results also suggested the involvement of some inorganic soil surfaces.

Materials and methods

Soils

The soils were chosen in order to cover a large range of organic carbon concentration which was supposed to be the most important parameter governing the adsorption of prosulfocarb. Soils EU1 to EU6 were Eurosoils provided by ISPRA. The other soils were collected in different Italian regions, mainly in Northern Italy. The soils were air dried, then sieved to 2 mm and stored at room temperature. Their main characteristics, determined in accordance with the methods of Società Italiana Scienza del Suolo are reported in the table below.

Table 2-1: Main properties of the soils studied

Soil name	Soil pH (H_2O)	OC [%]	Clay [%]	Loam [%]	Sand [%]	CEC [meq/100 g soil]	Oxalate extractable [%]		Dithionite-citrate-bicarbonate extractable [%]	
							Fe	Al	Fe	Al
EU6	8.6	0.13	15	64.5	20.6	6.48	0.12	0.06	1.00	0.11
CI	6.2	0.33	5.3	5.6	89.1	2.18	0.04	0.02	0.73	0.08
CR	8	0.67	5.6	51.2	43.3	37.0	0.15	0.08	0.63	0.09
EU1	6	0.76	28.8	27.1	44.2	21.88	0.52	0.06	0.71	0.15
SV	6.4	0.85	9	53.4	47.5	37.4	0.39	0.10	0.74	0.12
CD	8	0.86	23.9	38.5	37.6	16.31	0.30	0.07	1.01	0.10
FS	6.3	0.94	9.9	36.2	54	40.9	0.45	0.09	0.98	0.15
CP	8	0.98	43.4	46.4	10.4	17.08	0.26	0.10	1.38	0.11
EU4	7	1.13	13.4	62.8	23.9	12.62	0.23	0.08	1.06	0.11
GR	8.2	1.21	27.5	49.9	22.6	10.86	0.25	0.08	0.59	0.08
RM	7.9	1.26	39.3	46.6	15.2	27.99	0.33	0.02	1.23	0.10
MA	5.2	1.43	5.2	28	66.8	4.40	0.18	0.08	0.39	0.08
CZ	5	1.93	2.6	25.1	72.4	8.30	0.17	0.16	0.52	0.18
EU3	5.6	2.64	2.7	29.8	67.5	10.62	0.54	0.16	1.46	0.22
VB	6	3.42	4.1	25.6	70.3	4.66	0.29	0.09	1.87	0.26
EU2	8.1	3.58	11.4	41.3	47.4	18.07	0.16	0.02	0.71	0.09
AV	8	7.93	4.1	26.2	69.8	55.26	0.95	0.06	1.41	0.06
EU5	3.6	8.14	0.5	9.9	89.7	21.42	0.06	0.10	0.07	0.15
MC	5.6	11.8	2.9	31.5	65.6	57.56	1.25	0.51	3.64	0.71
TR	6.7	19.0	1.5	21.2	77.3	86.77	0.58	0.19	0.86	0.20

Reagents

Prosulfocarb (98.9% pure) was a Pestanal analytical standard provided by Sigma-Aldrich. All reagents were analytical or HPLC grade.

Adsorption on soil

Adsorption isotherms on soils were obtained by the equilibration of sorbent (5 g) with calcium chloride solutions (0.01 N; 25 mL) containing an increasing concentration (4–32 µM) of prosulfocarb in the dark at 25°C for 24 h. Calcium chloride was used as a supporting electrolyte to minimize ionic strength variations. The supernatant was separated by centrifugation (3000 rpm for 30 min) and the concentration of prosulfocarb in solution was determined by high performance liquid chromatography (HPLC). The amount adsorbed was calculated by subtraction.

HPLC analysis

The liquid phases of the adsorption experiments and of the bioassays were diluted with acetonitrile, filtered on a 0.45 µm syringe filter and analysed by HPLC under the following conditions: the instrument was a Perkin Elmer LC250 equipped with a Perkin Elmer LC235 diode array detector and a Lichrosphere LC18 (25 cm, 4.6 mm, 5 µm) column; the mobile phase was water acidified to pH 3 with phosphoric acid + acetonitrile (40 + 60 by volume); the wavelength was 220 nm.

Results and discussion

Adsorption isotherms on soils fitted the Freundlich equation. The corresponding coefficients K_f and 1/n are reported in the table below, along with the average K_d of each isotherm.

Table 2-2: Adsorption coefficients of prosulfocarb on different soils

Soil name	1/n	K_f [mol kg^{-1}/(mol $L^{-1})^{1/n}$]	R^2	K_d (average) [L/kg]	K_{OC}
EU6	1.21	2.6	0.913	4.4	20
CI	0.85	4.8	0.973	3.3	14.5
CR	0.74	13.4	0.921	7.4	20
EU1	0.69	87.4	0.952	88.2	115
SV	0.75	21.2	0.938	13.6	24.9
CD	0.99	8.9	0.979	8.7	10.3
FS	0.74	18.3	0.963	10.9	19.5
CP	0.99	19.6	0.977	19.6	20
EU4	0.88	18.2	0.913	15.9	16.1
GR	1	12.9	0.93	14.1	10.7
RM	0.78	20.4	0.988	14.3	16.2
MA	0.88	45.1	0.985	40.8	31.5
CZ	0.98	35.5	0.955	33.8	18.4
EU3	0.69	65.2	0.935	54.4	24.7
VB	1	74.2	0.978	76.5	20
EU2	0.7	70.2	0.867	64.5	19.6
AV	0.86	95.9	0.923	87.2	12.1
EU5	n.d.	n.d.	n.d.	n.d.	n.d.
MC	n.d.	n.d.	n.d.	n.d.	n.d.
TR	n.d.	n.d.	n.d.	n.d.	n.d.

n.d.: not determinable because adsorption was close to 100% of the amount of prosulfocarb in solution

Most of the isotherms were L-type (1/n < 1), indicating a progressive saturation of the adsorption sites at increasing concentration of the herbicide. Isotherms were linear (1/n = 1) on soils CD, CP, GR and VB, and S-type on soil EU6. S-type isotherms are unusual in adsorption of organic xenobiotics on whole soils but have been reported in adsorption on clays. Soil EU6 has a medium clay content (15%) as well as a very low organic carbon content (0.13%), and its particular behaviour (S-isotherm) could be attributed to a preferential interaction with the predominant clay surfaces. In the case of highly organic soils (EU5, MC and TR), isotherm determination was not possible because the amount of prosulfocarb left in solution after equilibration was too low to be detected with sufficient accuracy. These results suggest that organic soil surfaces play a predominant role in the adsorption of prosulfocarb. In order to indicate a possible relationship between adsorption and organic matter and other soil components, a tentative plot was made of the average K_d values of each isotherm against organic carbon, clay, DCB and oxalate extractable Fe and Al. Coefficient K_d was used rather than K_f because K_f [mol kg^{-1}/(mol L^{-1})$^{1/n}$] is dependent on 1/n, and hence comparison between K_f of isotherms having different 1/n values is not mathematically correct. Only the organic carbon content was correlated with K_d, although with a low correlation coefficient (R^2 = 0.50) (Figure 7.1.3-1). However, when excluding soil EU1 from the calculation, R^2 increased to 0.806.

The high extent of adsorption of prosulfocarb on soil EU1, notwithstanding its low organic carbon content, indicated by its very high K_{oc}, could be due to the affinity of prosulfocarb for the inorganic surfaces, in particular clay minerals, as suggested by the high clay content of this soil (28.8%). However, assuming that prosulfocarb can adsorb on the clay surfaces, it is not clear why other soils with high clay contents (CP, GR, RM) do not behave as EU1 and why no correlation between K_d and clay content was found. An explanation could be that the involvement of the clay surfaces in adsorption occurs only in poorly organic soils rich in clay minerals. On the other hand, if the clay fraction controls adsorption on soil EU1, the isotherm should be S-type as observed for EU6. These discrepancies reflect the complexity of the adsorption process, which seems to be mediated not only by the amount of each soil component but also by the way these components interact, and probably by other factors, such as, for example, the soil pH (acidic for soil EU1 and basic for the other clay-rich soils). The nature of the inorganic soil fraction is likely to be another important factor controlling the adsorption behaviour of prosulfocarb. Information on the mineralogical composition of the soils would be useful for a more quantitative understanding of the adsorption behaviour.

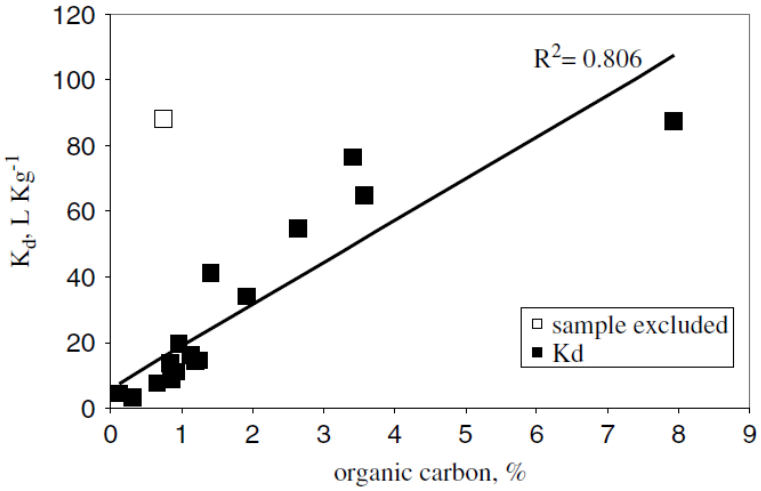


Figure 2-1: Correlation between K_d and soil organic carbon

(Negre *et al.*, 2006)

Reliability Assessment			
Criteria		**Score**	**Evaluator's comments on criteria (optional)**
No	**Test substance identification**		
1	Is the purity of the substance given?	1	98.9%
2	Is information on the source/origin of the substance given?	1	Sigma-Aldrich
3	Is all information on the nature and/or physico-chemical properties of the test item given, which you deem indispensable for judging the data?	1	The information is publicly available.
	Subtotal Test substance identification	**3/3**	
	Test sample characterization		
4	Is information given on the source of test samples plus, if considered necessary to judge the study, other specifications?	1	
5	Are the important parameters (organic carbon, clay content, soil texture and pH) specified in OECD Test No.106 given?	1	
6	Are the methods used for soil characterisation given?	1	The methods of Societ`a Italiana Scienza del Suolo
7	Does the method of collection, storage and preparation of soil samples meet the description in OECD Test No.106?	1	
	Subtotal Test sample characterization	**4/4**	
	Study design / Test method documentation		
8	Was preliminary study or established estimation conducted to determine the soil/solution ratio, equilibration time and other experimental parameters?	0	Not stated.
9	Does the experimental procedure meet the description in OECD Test No.106?	1	Well aligned with OECD Test No.106. Only agitation conditions are not stated.
10	Do the numbers of test substance concentration, controls and replicates meet the description in OECD Test No.106?	0	Not stated clearly. Only test substance concentration range is stated.
11	Is an analytical method with sufficient accuracy described?	0	Analytical procedure is described, but no validity information or reference is stated.
	Subtotal Study design / Test method documentation	**1/4**	
	Study results documentation		
12	Are the study endpoint(s) and their method(s) of determination clearly described?	1	
13	Is the description of the study results for all endpoints investigated transparent and complete?	0	No indivisual measurements are described.
14	Are the calculation methods applied for data analysis given and applied in a transparent manner?	0	Not stated clearly.
	Subtotal Study result documentation	**1/3**	
	Total Score	**9/14**	

Study Assessment	Score	Rationale
Reliability	Klimisch 3 (Documentation is not sufficient for an assessment and is not convincing for an expert judgement.)	• 9 out of 14 reliability criteria are met according to No.30-syouan-6278 and OECD Test No. 106. • The information of test substance, test samples and experimental procedure is well-documented. • The study endpoints are clearly described. • Several critical information for judging the data is missing. - Preliminary study or estimation methods for the determination of critical test parameters - Presence of control(s) or blank(s) - Number of replicates tested - Number of test substance concentrations tested - Validity information/reference of the analytical method employed - Calculation method employed
GLP	**No**	**n.a.**
Date of evaluation:		September 13, 2022
Evaluator information		
Name		Hiroyuki Suzuki (Syngenta Japan K.K.)

3. References

- Klimisch H-J, Andreae M and Tillmann U (1997): A systematic approach for evaluating the quality of experimental toxicological and ecotoxicological data. *Regulatory Toxicology and Pharmacology* 25: 1-5
- MAFF (2021): Data requirements for registration of agricultural chemicals (Annex); "Effect on livestock, or flora and fauna in the human living environment" (The notification No.30-syouan-6278, issued on March 29, 2019, amended on August 17, 2021)
- OECD (2000): OECD Guidelines for the Testing of Chemicals, No. 106, January 21, 2000, "Adsorption – Desorption Using a Batch Equilibrium Method"

農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査報告書

有効成分名：プロスルホカルブ

提出日：2022 年 9 月 16 日
修正日：2023 年 2 月 27 日

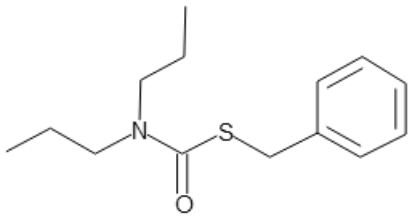
シンジェンタジャパン株式会社

農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査
有効成分名：プロスルホカルブ

目次

1.検索対象有効成分及び検索実施日、検索期間

1.1.検索対象有効成分

一般名	プロスルホカルブ、Prosulfocarb
化学構造	
IUPAC/CAS 名	*S*-(phenylmethyl) dipropylcarbamothioate
CAS 番号	52888-80-9

1.2.検索データベース/プラットフォーム

英文論文検索：Web of Science Core Correction（WOSCC）

和文論文検索：J-STAGE

1.3.検索実施日

WOSCC　　：2022 年 3 月 24 日

J-STAGE　　：2022 年 8 月 3 日

1.4.検索期間

WOSCC　　：2016 年 3 月 1 日～2022 年 1 月 31 日

J-STAGE　　：2007 年 1 月 1 日～2022 年 1 月 31 日

2.検索条件

2.1.検索に用いたデータベース

文献検索に用いた検索プラットフォームの特徴、収載範囲、最新更新日/更新頻度、検索日、検索期間を表1に示した。また、欧州化学品庁（ECHA）、欧州食品安全機関（EFSA）、米国環境保護庁（USEPA）、FAO/WHO合同残留農薬専門家会議（JMPR）の評価書に結果が引用されている文献を検索する際には、表2に示した各国、各機関のデータベースを用いて有効成分名による検索を実施し、該当する評価書を選抜した。該当する評価書から、該当有効成分に関してリスク評価に関連して利用可能な文献を選抜した。

表 1　文献検索に用いたデータベース（文献データベース）

データベース名	データベースの特徴	収載範囲 (文献検索時の文献数)	最新更新日 更新頻度	検索日	検索期間
Web of Science Core Collection	科学、社会科学、芸術、人文科学における世界有数の学術雑誌、書籍の検索データベース	1900 年～現在 (15 億件)	2022/3/23 毎日更新	2022/3/24	2016/3/1～ 2022/1/31
J-STAGE	国立研究開発法人科学技術振興機構（JST）が提供する、日本国内の科学技術情報の電子ジャーナルプラットフォーム。自然科学、人文・社会科学、学際領域等の分野について、国内 1,500 以上の発行機関が、3,000 誌以上のジャーナルや会議録等の刊行物を公開。	1999 年～現在 5,435,807 件 (2022 年 8 月)	2022/8/3 毎日更新	2022/8/3	2007/1/1～ 2022/1/31

表 2 文献検索に用いたデータベース（国際機関評価情報）

データベース名	データベースの特徴	最新更新日	検索日	本有効成分の状況
ECHA substance database	第三者から提供されたデータを含む、物質の EU 分類（調和）についての非機密データの要約。正確性を期すためには、EU 官報の電子版など、公式な情報源を参照する必要がある。	2022/6/24	2022/6/28	・ECHA 届出済
EU Pesticides Database (v2.2)	農薬製品に使用されている有効成分、食品中の最大残留基準値（MRL）、加盟国における農薬製品の緊急認可に関する情報。	2022/6/11	2022/6/28	・登録あり ・再評価中
OpenEFSA Portal	EFSA 関連の評価状況、資料と試験（非機密）、会議の議題と議事録、専門家情報など、資料の受領から EFSA 見解の採択までのリスク評価プロセスのデータベース。	-	2022/6/28	・登録あり ・再評価中
Official website of the United States Government	2003 年に開設された、米国 EPA、消費者製品安全委員会（CPSC）、化学物質安全・有害性調査委員会（CSB）など、複数の米国機関の規制動向、パブリックコメント、補足分析、通知、規則など、公開されているすべての規制資料の検索サイト。	2022/3/27	2022/6/28	・登録なし
FAO/WHO (JMPR)	国際的な食品貿易の安全性、品質、公平性に貢献するために、国際的な食品規格、ガイドライン、実施規範に関する情報。関連する農薬の毒性および残留データは、FAO/WHO の残留農薬に関する合同専門家会議（JMPR）で評価または再評価実施。	2022/6/27	2022/6/28	・Codex MRL 設定なし

2.2.検索に使用したキーワード

化合物名のキーワードには、表 3-1、3-2、3-3 及び 3-4 に示した有効成分並びに製剤名（商品名）を設定した。日本及び欧州の評価結果において、ヒトの健康や環境影響を評価する上で考慮しなければならないとされた化合物、たとえば、有効成分よりも毒性が高いと判断された代謝物、分解物等のその他成分は認められず、検索対象とはしなかった。J-STAGE を使用した文献検索においては、英語（アルファベット）と日本語をそれぞれキーワードに設定した検索結果が異なること、及びキーワードの入力に関して文字数の制限があることから、「4 分野に関連する文献検索に用いたキーワード」及び「評価対象となる生物種等に関するキーワード」については、英語及び日本語キーワードの検索を別に行い、結果を統合して適合性評価（第 1 段階、第 2 段階）を実施した。

2.2.1.化合物名

表 3-1　検索に用いたキーワード：有効成分プロスルホカルブ（WOSCC）

一般名	Prosulfocarb
IUPAC/CAS 名	*S*-(phenylmethyl)dipropylcarbamothioate *S*-benzyl-dipropylcarbamothioate
CAS 番号	52888-80-9
EEC Number	634-871-9
その他名称	ICI574

表 3-2　検索に用いたキーワード：有効成分プロスルホカルブ（J-STAGE）

一般名	プロスルホカルブ、Prosulfocarb
IUPAC/CAS 名	*S*-(フェニルメチル) ジプロピルカルバモチオアート *S*-(phenylmethyl) dipropylcarbamothioate
CAS 番号	52888-80-9
その他名称	ICI574

表 3-3　検索に用いたキーワード：有効成分プロスルホカルブを含む製剤（WOSCC）

製剤名	Boxer
その他名称	–

表 3-4　検索に用いたキーワード：有効成分プロスルホカルブを含む製剤（J-STAGE）

製剤名	ボクサー、Boxer
その他名称	–

2.2.2.評価対象となる影響

4 分野に関する文献検索において WOSCC は表 4-1 に示す分類フィールドを用い、J-STAGE では表 4-2 に示すキーワードおよび必要に応じてワイルドカードを設定し、遺漏の無い検索を実施した。

表 4-1　WOSCC 検索における評価対象となる影響に関する分類フィールド

ヒトに対する毒性	toxicology public environmental occupational health
農作物及び畜産物への残留	plant sciences environmental sciences
生活環境動植物及び家畜に対する毒性	toxicology environmental sciences entomology ecology
環境動態	environmental sciences

表 4-2　4 分野に関連する文献検索に用いたキーワード（J-STAGE）

ヒトに対する毒性	mortality OR irritation OR sensitization OR allergy OR hypersensitivity OR metaboli* OR distribution OR absorption OR excretion OR kinetic OR PK OR TK OR cytochrome OR enzyme OR mutagen OR DNA OR genotoxicity OR carcinogen OR cancer OR tumor OR oncology OR immune OR neurotoxicity OR endocrine OR hormone OR development* OR toxicity OR reproduction OR malformation OR maternal OR pregnancy OR embryo OR fetus OR offspring OR *dermal OR exposure OR operator OR worker OR occupant OR biomonitoring OR medical OR poison OR apoptosis OR necrosis OR cytotoxic OR cohort OR epidemiology OR adverse effect OR case control
	"死亡率" OR "刺激性" OR "感作性" OR "アレルギー" OR "過敏症" OR "代謝" OR "分布" OR "吸収" OR "排泄" OR "キネティックス" OR "PK" OR "TK" OR "チトクローム" OR "酵素" OR "変異原" OR "DNA" OR "遺伝毒性" OR "発がん性物質" OR "発がん" OR "腫瘍" OR "免疫" OR "神経毒性" OR "エンドクリン" OR "内分泌かく乱化学物質" OR "ホルモン" OR "発達" OR "毒性" OR "生殖" OR "奇形" OR "母性" OR "妊娠" OR 胚 OR "胎児" OR "子孫" OR "経皮" OR "ばく露" OR "作業者" OR "使用者" OR "居住" OR "バイオモニタリング" OR "医学" OR 毒 OR "アポトーシス" OR "壊死" OR "細胞毒性" OR "コホート" OR "疫学" OR "悪影響" OR "事例研究"
農作物及び畜産物への残留	uptake OR metaboli* OR breakdown OR translocation OR degradation OR storage OR stability OR residue OR process OR preharvest OR postharvest OR preplant OR *emergence OR "processing factor" OR "conversion factor" OR hydroxylation OR photolysis OR rotation OR succeed OR "supervised trial" OR "field trial" OR "dietary exposure" OR MRL OR "maximum residue"
	"取込" OR "代謝" OR "分解" OR "移行" OR "保存" OR "安定性" OR "残留" OR "過程" OR "プロセス" OR "収穫前" OR "収穫後" OR "移植前" OR "播種" OR "処理能力" OR "換算係数" OR "加水分解" OR "光分解" OR "輪作" OR "後作" OR "管理試験" OR "圃場試験" OR "食品経由での暴露" OR "MRL" OR "最大残留"
生活環境動植物及び家畜に対する毒性	bioaccumulation OR bioconcentration OR biomagnification OR effect OR biodiversity OR protection goals OR eco OR impact OR population OR pest OR "endocrine disrupt*" OR acute OR chronic OR long term OR ecotoxicology OR colony OR hive OR aquatic OR freshwater OR macro organism OR micro organism OR microbial OR biodegradation
	"生物濃縮" OR "影響" OR "生物多様性" OR "環境保護目標" OR "集団" OR "病害" OR "エンドクリン" OR "内分泌かく乱物質" OR "急性" OR "慢性" OR "長期" OR "生態毒性" OR "コロニー" OR "巣" OR "水生" OR "淡水" OR "微生物" OR "生分解"
環境動態	degradation OR photo OR hydrolysis OR accumulate OR dissipation OR "vapor pressure" OR mobility OR adsorption OR desorption OR persistent OR pollution OR contamination OR aged residue OR column leaching OR leach OR lysimeter OR drift OR run off OR atmosphere OR transport OR long range transport OR short range transport OR monitoring OR surveillance OR environmental OR exposure OR fate OR residue
	"分解" OR "光" OR "加水分解" OR "濃縮" OR "消失" OR "蒸気圧" OR "移行性" OR "吸着" OR "脱着" OR "残留性" OR "集団" OR "汚染" OR "カラムリーチング" OR "ライシメーター" OR "ドリフト" OR "飛散" OR "流亡" OR "大気" OR "移動" OR "モニタリング" OR "サーベイ調査" OR "環境" OR "動態" OR "残留"

*：　ワイルドカード（前方一致検索、後方一致検索）

2.2.3.評価対象の生物種等

以下の 4 分野に関連する評価対象の生物種等のキーワード設定において、WOSCC では表 5-1 に示すキーワードを、J-STAGE では表 5-2 に示す英文及び和文のキーワードを設定し、必要に応じてワイルドカード（前方一致検索、後方一致検索）を用いて、遺漏の無い検索を実施した。

表 5-1 評価対象となる生物種等に関するキーワード（WOSCC）

ヒトに対する毒性	rat* OR mouse OR mice OR dog* OR rabbit* OR monkey* OR pig* OR human* OR hen OR *typhimurium* OR *coli* OR somatic OR gen* OR public OR health OR epidemi* OR public
農作物及び畜産物への残留	crop* OR plant* OR commodity OR food OR feed* OR livestock OR hen OR cattle* OR cow* OR goat* OR pig* OR ruminant* OR cow* OR poultry OR honey OR milk OR process*
生活環境動植物及び家畜に対する毒性	plant* OR avian OR wild OR bird* OR mallard OR duck OR quail OR bobwhite OR vertebrat* or mammal* OR rat OR mouse OR mice OR rabbit* OR hare OR lemna OR alga* OR fish OR amphib* OR reptil* OR daphni* OR crustace* OR aquatic OR marin* OR estuarine* OR chiron* OR sediment dwell* OR gastropod* OR mollusc* OR bumble OR honey OR solitary OR bee* OR pollinator OR api* OR arthropod* OR beneficial* OR insect* OR collembol* OR earthworm*
環境動態	soil OR water* OR sediment OR air

*： ワイルドカード（前方一致検索、後方一致検索）

表 5-2 評価対象となる生物種等に関するキーワード（J-STAGE）

ヒトに対する毒性	rat OR mouse OR dog OR rabbit OR monkey OR pig OR human OR hen OR typhimurium OR coli
	"ラット" OR "マウス" OR "イヌ" OR "ウサギ" OR "サル" OR "ブタ" OR "人間" OR "ヒト" OR "ニワトリ" OR "チフス菌" OR "大腸菌"
農作物及び畜産物への残留	crop OR plant OR commodity OR food OR feed OR livestock OR hen OR cattle OR goat OR pig OR ruminant OR cow OR poultry
	"作物" OR "植物" OR "食料" OR "飼料" OR "家畜" OR "ニワトリ" OR "乳牛" OR "ヤギ" OR "ブタ" OR "反すう動物" OR "ウシ" OR "家きん"
生活環境動植物及び家畜に対する毒性	avian OR bird OR mallard duck OR quail OR bobwhite OR lemna OR alga* OR daphnia OR fish OR crustacean OR aquatic OR chironomus OR bee OR pollinator OR apis
	"植物" OR "鳥類" OR "野生" OR 鳥 OR "マガモ" OR "アヒル" OR "ウズラ" OR "ウキクサ" OR "藻類" OR "ミジンコ" OR 魚 OR "甲殻類" OR "水生" OR "ユスリカ" OR "ハチ" OR "花粉媒介生物" OR "ミツバチ"
環境動態	soil OR water OR sediment
	"土壌" OR "水" OR "底質"

*： ワイルドカード（前方一致検索、後方一致検索）

3.適合性及び信頼性評価方法

3.1.第 1 段階の適合性評価（Rapid Assessment）における判断基準

文献の表題及び概要に基づき、明らかに評価の目的と適合しない文献の除外を目的として下記の①～⑮の選抜条件を設定して検証し、それに該当したものは以降の検討から除いた。

① 当該農薬と関係しない論文（当該農薬の代替剤等）
② 政策、社会、経済分析に関する論文
③ 農産物等の生産、流通に関する論文
④ 薬効、薬害、物理的化学的性状に関する論文
⑤ 分析法やその開発に関する論文
⑥ 新規合成法や基礎化学の観点で記載された論文
⑦ 特許関連文献
⑧ リスク評価をする上で十分なデータや情報を含まない学会発表等の概要や総説、成書
⑨ リスク評価に使用できる新規のデータが提示されていない意見書
⑩ 科学論文や規制についての総説を含む二次情報において、当該文献が参照する一次資料（原著）の確認ができないもの
⑪ 一般的な農薬の暴露に関する論文（当該農薬に限定せず、広範囲の農薬について記載されたもの）
⑫ 異なる有効成分に由来する混合製剤の毒性に関する論文
⑬ 2.2.2の 4 分野に関係しない論文
⑭ 日本で登録されている処方以外の製剤に関する論文
⑮ コンピュータシミュレーション等を用いたドライラボのみの論文

3.2.第 2 段階の適合性評価（Detailed Assessment）における判断基準

第 2 段階として、第 1 段階で除外した以外の公表文献については、文献全文の内容に基づいて評価目的との適合性を検証し、その結果により分類した。3.1の①から⑮及び以下の①～②の選抜条件を設定して検証し、除外理由を明記して以降の検討から除外した。

① 試験設計、試験系、試験種、被験物質、暴露経路等が評価に活用する観点で妥当でないもの
  ①-1 試験方法が記載されていないもの
  ①-2 適切に評価できる試験種で実施されていないもの
  ①-3 適切な経路で投与/処理されていないもの
  ①-4 投与又は処理した被験物質量が明記されていないもの
  ①-5 添加に用いた媒体が確認できないもの
  ①-6 分析法が記載されていないもの
② 日本の代表的な使用方法/使用条件における評価に活用できない文献（ほ場条件、土性等）

3.3.区分 a、b、c への分類

3.1及び3.2で除外した以外の文献については、適合性があると判断した文献とし、分類基準を設定して全文をレビューし、下記 3 つの区分（表6）に分類した。その際の分類基準として、以下の①～⑥を設定した。また、ヒトに対する毒性に関して、区分 a に該当するかどうかについては、⑦～⑨を参考とした。

① 実施している試験環境がテストガイドラインで定める条件と合っていること
② 投与又は処理した被験物質の純度が明記されていること
③ 統計解析が可能な動物数／例数が確保されていること
④ 複数の用量で実施されていること（最低 3 用量で実施）
⑤ 無処理区（コントロール区）が設定されており、テストガイドラインに照らしその結果が適正であること
⑥ 解析方法及び結果が報告されていること
⑦ 公表文献で用いられた用量が、研究内容と同等である安全性試験で用いられた最低用量よりも低いこと
⑧ 公表文献の研究結果が、他の試験結果と比較できる単位を用いて報告されていること
⑨ 研究の結論、エンドポイント及び用量が正確で、信頼でき、妥当であることを実証するための十分な情報が公表文献中に提供されており、研究結果が再現される可能性があると判断できること

表 6 評価目的への適合性がある文献の分類

区分	該当する文献
a	リスク評価パラメーター（ADI、ARfD、AOEL、残留基準、生活環境動植物の登録基準、水産PEC 等）を設定又は見直すために利用可能と判断される文献
b	リスク評価パラメーターを設定する際の補足データとして利用が可能と想定される文献
c	a 又は b に分類されない文献

3.4.結果の信頼性に基づく分類

評価目的への適合性評価において「区分 a 」に分類した文献については、論文の信頼性を評価する方法として国際的に広く用いられているKlimisch基準（表7）における分類を参考として、適切な分類基準を設定し、信頼性を評価した。ヒトに対する毒性以外の 3 分野については、6278号局長通知で定めるテストガイドラインへの適用状況を中心に分類基準を設定し、Klimisch基準のどの分類に該当するかを判断した。

表 7 Klimisch 基準の概要

分類	信頼性	判断基準
1	信頼性あり（制限なし）	以下のいずれかの試験/データに該当する場合。 ・有効性が確認された方法又は国際的に認められたテストガイドラインに基づいて実施されている（GLP適合が望ましい）。 ・試験項目（評価パラメーター）が特定（国レベル）のテストガイドラインに基づいている。 ・全ての試験項目がテストガイドラインに示された方法と関連性が強い/同等により報告されている。
2	信頼性あり（制限あり）	以下のいずれかの試験/データに該当する場合（非GLP試験のことが多い）。 ・試験項目は特定の試験ガイドラインに完全には準拠していないが、内容が受け入れ可能である。 ・試験方法がテストガイドラインから逸脱しているものの、詳細な報告に基づき科学的に受け入れ可能な結果が示されている。
3	信頼性なし	試験系、被験物質又は暴露経路の妥当性、記載情報の不十分さ等の観点から、エキスパートジャッジのためには許容できないと考えられる試験/データ。
4	評価不能	試験の詳細が不明であり、要約のみの記載又は二次情報（書籍、総論等）として記載された試験/データ。

（１）ヒトに対する毒性については、ToxRtool (Toxicological data Reliability assessment Tool)を分類基準として活用した。（https://ec.europa.eu/jrc/en/scientific-tool/toxrtool-toxicological-datareliability-assessment-tool）

（２）それ以外の3 分野については、6278 号局長通知で定めるテストガイドラインへの適用状況を中心に以下のような分類基準を設定し、Klimisch 基準のどの分類に該当するかを判断した。

(ア) 農作物及び畜産物への残留

① 試験した作物がTG で定める代表的な作物か

② 試験系の条件が明記されているか（たとえば、作物の生育ステージ、圃場の状況、処理量、処理方法、処理時期、PHI、サンプリング方法）

③ サンプリング後の試料保管中の被験物質の安定性が検証されているか

④ サンプリング後の試料の保管条件が明記されているか

⑤ 栽培条件（密度や仕立て）が適切であるか

⑥ 処理量が登録で定めるGAPの範囲内であるか

(イ) 生活環境動植物及び家畜に対する毒性

① 水生生物試験では、被験物質が水に溶解していること

② 供試した生物種の由来、飼育条件、系統、週齢、体重あるいは体長、等が明らかであること

③ 試験期間の環境（温度等）がTG に照らし適切であること

④ 試験期間を通じて計画した濃度で被験物質に暴露していること

⑤ 経時的な観察記録や結果の確認がなされていること

(ウ) 環境動態

① 試験系の条件が明記されていること（たとえば、土壌の試験であれば、土質、pH、有機炭素含量、密度、水分含量、微生物活性等）

② 試験に使用した土壌等がTGで定める条件を満たしていること

③ サンプリング方法がTGで定めた条件をみたしていること

④ サンプリング後の試料の保管中の被験物質の安定性が検証されていること

⑤ サンプリング後の試料の保管条件が明記されていること

4.検索結果のまとめ

日本語の文献検索においては、J-STAGE の検索式の入力枠に字数制限があったため、前段階として名称ごとのヒット数を確認した。その結果、ヒット数がゼロだった名称は検索キーワードから除外することとした。ヒット数が多かったが除外したキーワードとその理由は次の通り。

ボクサーまたは Boxer：「ボクサー」で 165 件、「Boxer」で 179 件のヒットがあったが、ボクサー骨折（中手骨骨折）、ボクサー犬（犬種）、人名、ボクシング関係、ヒューマンビートボクサーなど、一見して農薬と無関係の論文多数であることがわかった。製剤ボクサーとの関連論文の有無を確認するため「(プロスルホカルブ OR Prosulfocarb) AND (ボクサー OR boxer)」で検索した結果ヒットしたのは 1 報のみで、同論文は英文だったため対象外であり、「ボクサー」および「Boxer」は検索用語から削除することとした。

4.1.各データベースを検索した結果のまとめ

表 8-1 Web of Science Core Collection における英文論文検索結果

データベース名	Web of Science Core Collection		
検索日	2022 年 3 月 24 日		
検索対象期間	2016 年 3 月 1 日～2022 年 1 月 31 日		
最終の更新日	2022 年 3 月 23 日		
検索に用いたキーワード	A：表 3-1、3-3 B：表 4-1 C：表 5-1		
検索結果			
検索条件（キーワード）	A	A AND B	A AND B AND C
対象とする農薬名で検索抽出した総論文数	875	NA	NA
ヒトに対する毒性	NA	*16	*14
農作物及び畜産物への残留	NA	*38	*26
生活環境動植物及び家畜に対する毒性	NA	*35	*11
環境動態	NA	*22	*14

NA： 該当なし
*： 4 分野間での重複あり

表 8-2　J-STAGE における和文論文検索結果

データベース名	J-STAGE		
検索日	2022 年 8 月 3 日		
検索対象期間	2007 年 1 月 1 日～2022 年 1 月 31 日		
最終の更新日	2022 月 8 月 3 日		
検索に用いたキーワード	A: 表 3-2、3-4 B: 表 4-2 C: 表 5-2		
検索結果			
検索条件（キーワード）	A	A AND B	A AND B AND C
対象とする農薬名で検索抽出した総論文数	16	NA	NA
ヒトに対する毒性	NA	*9	*3
農作物及び畜産物への残留	NA	*15	*15
生活環境動植物及び家畜に対する毒性	NA	*15	*12
環境動態	NA	*14	*12

NA：　該当なし
*：　4 分野間での重複あり

表 9　すべてのデータベースの検索結果を統合したまとめ

分野	論文数	
	WOSCC	J-STAGE
対象とする農薬名で検索抽出した総論文数（全データベースの合計）	875	16
データベース間の重複を除いた総論文数(4 分野間の重複を除く)	50	16
ヒトに対する毒性に関する論文数	*14	*3
農作物及び畜産物への残留に関する論文数	*26	*15
生活環境動植物及び家畜に対する毒性に関する論文数	*11	*12
環境動態に関する論文数	*14	*12

*：　4 分野間での重複あり

4.2.適合性の確認結果

表 10-1　評価目的との適合性評価（第 1 段階、第 2 段階）の結果のまとめ（WOSCC）

分野	該当する論文数	第1 段階		第2 段階	
		適合性なし	それ以外（第 2 段階へ）	適合性なし	適合性あり
ヒトに対する毒性	*14	-	-	0	0
農作物及び畜産物への残留	*26	-	-	1	0
生活環境動植物及び家畜に対する毒性	*11	-	-	1	0
環境動態	*14	-	-	12	0
上記以外	NA	-	-	**36	0
合計	50	-	-	50	0

-：　第 1 段階適合性評価を省略
NA：　該当なし
*：　4 分野間での重複あり
**：　文献全文を用いた第 2 段階適合性評価を実施した結果、上記 4 分野には該当しなかった文献数

表 10-2　評価目的との適合性評価（第 1 段階、第 2 段階）の結果のまとめ（J-STAGE）

分野	該当する論文数	第1 段階		第2 段階	
		適合性なし	それ以外（第 2 段階へ）	適合性なし	適合性あり
ヒトに対する毒性	*3	0	0	NA	NA
農作物及び畜産物への残留	*15	0	0	NA	NA
生活環境動植物及び家畜に対する毒性	*12	0	0	NA	NA
環境動態	*12	0	0	NA	NA
上記以外	NA	**16	0	NA	NA
合計	16	16	0	NA	NA

NA：　該当なし
*：　4 分野間での重複あり
**：　表題、概要を用いた第 1 段階適合性評価を実施した結果、上記 4 分野には該当しなかった文献数

表 11　適合性評価第 2 段階で適合性ありとされた文献と分類結果

分野	該当する論文数					
	区分 a		区分 b		区分 c	
	WOSCC	J-STAGE	WOSCC	J-STAGE	WOSCC	J-STAGE
ヒトに対する毒性	NA	NA	NA	NA	NA	NA
農作物及び畜産物への残留	NA	NA	NA	NA	NA	NA
生活環境動植物及び家畜に対する毒性	NA	NA	NA	NA	NA	NA
環境動態	NA	NA	NA	NA	NA	NA
合計	NA	NA	NA	NA	NA	NA

NA：　該当なし

4.3.海外評価機関等の評価書に引用のある文献

表 2 に記載のあるデータベースを検索して、EFSA、USEPA、JMPR 等の海外公的機関における評価書を検索し、その検索結果を表 12 に示した。

選抜した評価書に結果が引用されている文献は認められなかった。

表 12　海外公的機関における関連リスク評価書を検索したデータベースと選抜した評価書

データベース	選抜した評価書名
EU Pesticides Database (v2.2)	EC (2006): Draft Assessment Report (DAR) Prosulfocarb, dated March 2006
	EC (2007): Review Report for the active substance prosulfocarb, SANCO/2824/07 – rev. 3, dated 9 October 2007
OpenEFSA Portal	EFSA (2007): Conclusion regarding the peer review of the pesticide risk assessment of the active substance prosulfocarb, dated 27 July 2007

表 13　適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC)

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
1	Ⅱ6.4	Slaby, S; Le Cor, F; Dufour, V; Auger, L; Pasquini, L; Cardoso, O; Curtet, L; Baudoin, JM; Wiest, L; Vulliet, E; Feidt, C; Dauchy, X; Banas, D	2022	Distribution of pesticides and some of their transformation products in a small lentic waterbody: Fish, water, and sediment contamination in an agricultural watershed	Environmental Pollution, 292 B http://dx.doi.org/10.1016/j.envpol.2021.118403	・フランス北東部のグランデスト地方の養魚場において水、底質及び魚を採取し、20 種類の農薬と 20 種類の代謝分解物を HPLC-ESI-MS/MS により分析 ・フランス北東部のグランデスト地方における特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない
2	Ⅱ7	Bo, XF; Sun, JF; Mei, Q; Wei, B; An, ZX; Han, DD; Li, ZQ; Xie, J; Zhan, JH; He, MX	2020	Degradation of prosulfocarb by hydroxyl radicals in gas and aqueous phase: Mechanisms, kinetics and toxicity	Ecotoxicology and Environmental Safety, 191 http://dx.doi.org/10.1016/j.ecoenv.2020.110175	・理論化学計算を用いて、H-脱離反応とセンタードット OH 付加反応の 2 種類の反応を考慮し、PSC の環境リスク、メカニズム、キネティクスおよび生成物を調査 ・既存の研究データを利用したドライラボ研究
3	Ⅱ7	Braun, KE; Luks, AK; Schmidt, B	2017	Fate of the C-14-labeled herbicide prosulfocarb in a soil and in a sediment-water system	Journal of Environmental Science and Health Part B-Pesticides Food Contaminants and Agricultural Wastes, 52 (2), 122-130 http://dx.doi.org/10.1080/03601234.2016.1248140	・ドイツ　メルゼンハウゼンの圃場から土壌を採取し、中国・長江三峡貯水池から底質を採取して、C-14 標識体プロスルホカルブの土壌及び水/底質における動態を調査 ・ドイツ　メルゼンハウゼンの圃場から採取した土壌及び中国・長江三峡貯水池から採取され底質を用いた分解試験であり、日本の代表的な使用方法/使用条件における評価に使用できない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
4	Ⅱ7.2	Barba, V; Marin-Benito, JM; Garcia-Delgado, C; Sanchez-Martin, MJ; Rodriguez-Cruz, MS	2019	Assessment of C-14-prosulfocarb dissipation mechanism in soil after amendment and its impact on the microbial community	Ecotoxicology and Environmental Safety, 182 http://dx.doi.org/10.1016/j.ecoenv.2019.109395	・^{14}C 標識プロスルホカルブを無処理及びグリーンコンポスト添加土壌に施用した場合の消長及び全物質収支を調査。土壌デヒドロゲナーゼ活性、リン脂質脂肪酸組成分析を行い、微生物群集の活動と構造に及ぼす影響を評価 ・スペイン サラマンカの典型的土壌と、有機残渣グリーンコンポストを基質として実施した土壌分解実験であり、日本の代表的な使用方法/使用条件における評価に使用できない
5	Ⅱ7	Devault, DA; Guillemin, JP; Millet, M; Eymery, F; Hulin, M; Merlo, M	2022	Prosulfocarb at center stage!	Environmental Science and Pollution Research, 29 (1), 61-67 http://dx.doi.org/10.1007/s11356-019-06928-8	・プロスルホカルブの理論的に予想される環境挙動を考慮し、フランスにおけるプロスルホカルブの現場使用と環境汚染の可能性に関するケーススタディを報告 ・既存の研究データを利用したドライラボ研究
6	Ⅱ7	Kruse-Plass, M; Hofmann, F; Wosniok, W; Schlechtriemen, U; Kohlschutter, N	2021	Pesticides and pesticide-related products in ambient air in Germany	Environmental Sciences Europe, 33 (1) http://dx.doi.org/10.1186/s12302-021-00553-4	・ドイツの生物保護区でパッシブエアサンプラーと換気フィルターマットを用いて、69 地点の環境大気中の農薬と関連物質を定量分析 ・ドイツにおける特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない
7	Ⅱ7	Marin-Benito, JM; Barba, V; Ordax, JM; Andrades, MS; Sanchez-Martin, MJ; Rodriguez-Cruz, MS	2018	Application of green compost as amendment in an agricultural soil: Effect on the behaviour of triasulfuron and prosulfocarb under field conditions	Journal of Environmental Management, 207, 180-191 http://dx.doi.org/10.1016/j.jenvman.2017.11.024	・トリアスルフロンとプロスルホカルブの市販製剤を砂質埴壌土に無添加及びグリーンコンポスト添加した圃場条件下で処理し、消長、残留性及び移行性を調査 ・スペイン サラマンカにおける特定の期間、場所、条件について代表的な圃場データであり、日本の代表的な使用方法/使用条件における評価に使用できない ・日本で登録されている処方以外の製剤に関する試験

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
8	Ⅱ7.1	Marin-Benito, JM; Barba, V; Ordax, JM; Sanchez-Martin, MJ; Rodriguez-Cruz, MS	2018	Recycling organic residues in soils as amendments: Effect on the mobility of two herbicides under different management practices	Journal of Environmental Management, 224, 172-181 http://dx.doi.org/10.1016/j.jenvman.2018.07.045	・2 種類の除草剤（トリアスルフロン、プロスルホカルブ）を、無添加土壌及びグリーンコンポストで改良した圃場実験圃場で 7 ヶ月間、2 回反復散布した後の移動性および残留性を評価 ・異なる有効成分による複合影響はリスク評価に利用できない ・被験物質は市販製剤（Auros Plus®）であり、日本で登録されている処方以外の製剤に関する試験
9	-	Amatori, S; Barley, OR; Gobbi, E; Vergoni, D; Carraro, A; Baldari, C; Guidetti, L; Rocchi, MBL; Perroni, F; Sisti, D	2020	Factors Influencing Weight Loss Practices in Italian Boxers: A Cluster Analysis	International Journal of Environmental Research and Public Health, 17 (23) http://dx.doi.org/10.3390/ijerph17238727	・当該有効成分、代謝物には関連性がない
10	Ⅱ7.1	Barba, V; Marin-Benito, JM; Sanchez-Martin, MJ; Rodriguez-Cruz, MS	2020	Transport of C-14-prosulfocarb through soil columns under different amendment, herbicide incubation and irrigation regimes	Science of the Total Environment, 701 http://dx.doi.org/10.1016/j.scitotenv.2019.134542	・プロスルホカルブを有機質改良剤としてグリーンコンポストを 20%添加した土壌カラムに処理し、28 日間 2 種類の灌漑方法を実施し、充填土壌カラムからの溶出に及ぼす影響を評価 ・スペイン サラマンカの典型的土壌と、有機残渣グリーンコンポストを基質として実施した土壌リーチング試験であり、日本の代表的な使用方法/使用条件における評価に使用できない
11	Ⅱ7	Villiot, A; Chretien, E; Drab-Sommesous, E; Riviere, E; Chakir, A; Roth, E	2018	Temporal and seasonal variation of atmospheric concentrations of currently used pesticides in Champagne in the centre of Reims from 2012 to 2015	Atmospheric Environment, 174, 82-91 http://dx.doi.org/10.1016/j.atmosenv.2017.11.046	・フランス ランス中心部において、大気試料を採取して農薬の定量分析を実施 ・フランス ランス シャンパーニュにおける特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
12	Ⅱ7	Garcia-Delgado, C; Barba-Vicente, V; Marin-Benito, JM; Igual, JM; Sanchez-Martin, MJ; Rodriguez-Cruz, MS	2019	Influence of different agricultural management practices on soil microbial community over dissipation time of two herbicides	Science of the Total Environment, 646, 1478-1488 http://dx.doi.org/10.1016/j.scitotenv.2018.07.395	・市販の複合製剤として散布された除草剤トリアスルフロンとプロスルホカルブの消長と、土壌から抽出したリン脂質脂肪酸組成を用いた土壌微生物群集の変化を圃場条件で評価 ・リスク評価対象生物種ではない ・異なる有効成分による複合影響は、リスク評価には利用できない ・日本で登録されている処方以外の製剤に関する試験
13	Ⅱ4 Ⅱ6	Dufour, V; Wiest, L; Slaby, S; Le Cor, F; Auger, L; Cardoso, O; Curtet, L; Pasquini, L; Dauchy, X; Vulliet, E; Banas, D	2021	Miniaturization of an extraction protocol for the monitoring of pesticides and polar transformation products in biotic matrices	Chemosphere, 284 http://dx.doi.org/10.1016/j.chemosphere.2021.131292	①魚類と大型無脊椎動物の分析マトリックスを用いて、農薬及び代謝分解物定量について、微量分析用のサンプル調製法を開発 ②フランスのドンブ地方の２つの池から採取した17匹の魚と 19 匹の無脊椎動物中の農薬残留を定量分析 ①分析方法の開発 ②フランスにおける特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない
14	-	Lim, LJH; Ho, RCM; Ho, CSH	2019	Dangers of Mixed Martial Arts in the development of chronic traumatic encephalopathy	International Journal of Environmental Research and Public Health, 16 (2) http://dx.doi.org/10.3390/ijerph16020254	・当該有効成分、代謝物には関連性がない
15	-	Casper, ST; O'Donnell, K	2020	The punch-drunk boxer and the battered wife: Gender and brain injury research	Social Science & Medicine, 245 http://dx.doi.org/10.1016/j.socscimed.2019.112688	・当該有効成分、代謝物には関連性がない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
16	-	Bischoff, K; Chiapella, A; Weisman, J; Crofton, LM; Hillebrandt, J	2017	Zinc Toxicosis in a Boxer dog secondary to ingestion of holiday garland	Journal of Medical Toxicology, 13 3, 263-266 http://dx.doi.org/10.1007/s13181-017-0602-z	・当該有効成分、代謝物には関連性がない
17	-	Nodari, ER; Alonso, S; Mancin, M; De Nardi, M; Hudson-Cooke, S; Veggiato, C; Cattoli, G; De Benedictis, P	2017	Rabies Vaccination: Higher failure rates in imported dogs than in those vaccinated in Italy	Zoonoses and Public Health, 64 (2), 146-155 http://dx.doi.org/10.1111/zph.12268	・当該有効成分、代謝物には関連性がない
18	-	Han, TS; Gabe, J; Sharma, P; Lean, MEJ	2020	Life expectancy of white and non-white elite heavyweight boxers	Journal of Racial and Ethnic Health Disparities, 7 (2), 281-289 http://dx.doi.org/10.1007/s40615-019-00656-y	・当該有効成分、代謝物には関連性がない
19	Ⅱ7	Kim, JH; Seo, JS; An, JY; Kwon, YS; Hwang, KH; Koo, SJ; Kim, JH	2020	Dissipation of herbicide methiozolin and its metabolites in aerobic sediment-water systems	Bulletin of Environmental Contamination and Toxicology, 105 (4), 656-664 http://dx.doi.org/10.1007/s00128-020-02976-w	・C-14 標識メチオゾリンを 2 つの底質（埴壌土、砂質）/水系に好気条件下で施用し、その 300 日以内の分布、半減期および代謝物について検討 ・当該有効成分、代謝物には関連性がない
20	Ⅰ5	Andersen, BJ; Samarappuli, DP; Wick, A; Berti, MT	2020	Faba bean and pea can provide late-fall forage grazing without affecting maize yield the following season	Agronomy-Basel, 10 (1) http://dx.doi.org/10.3390/agronomy10010080	・飼料、被覆作物、翌シーズンのトウモロコシ *Zea mays* への栄養分の循環において、マメとエンドウとの相互関係を調査 ・当該有効成分、代謝物には関連性がない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
21	Ⅰ5	Kacan, K	2020	Developing effective control methods and investigating problematic weeds in sesame (Sesamum indicum l.) production areas in Mugla, Turkey	Fresenius Environmental Bulletin, 29 (11), 9590-9600	・圃場試験において、オリーブ工場排水、手鍬の使用、除草剤散布（イマザモックス、リニュロン、オキサジアゾン、クロリダゾン、プロスルホカルブ+メトリブジン、ベンダゾン+MCPA、ペンディメタリン、メトラクロール+ベノキサコール）による雑草への制御効果を検討 ・薬効試験 ・異なる有効成分による複合影響
22	Ⅰ5 Ⅱ7	Scherner, A; Schreiber, F; Fomsgaard, IS; Melander, B; Avila, LA; Kudsk, P	2018	Effect of tillage systems on the dissipation of prosulfocarb herbicide	Weed Technology, 32 (2), 195-204 http://dx.doi.org/10.1017/wet.2017.103	・プロスルホカルブを 3 種類の耕起システムで管理した圃場に冬期穀物の早まきと遅まき作物に対して施用し、土壌試料を HPLC 化学分析と Silky Windgrass を指標植物とするバイオアッセイで調査 ・薬効試験 ・デンマークにおける特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない
23	Ⅱ7	Mhadhbi, T; Pringault, O; Nouri, H; Spinelli, S; Beyrem, H; Gonzalez, C	2019	Evaluating polar pesticide pollution with a combined approach: a survey of agricultural practices and POCIS passive samplers in a Tunisian lagoon watershed	Environmental Science and Pollution Research, 26 (1), 342-361 http://dx.doi.org/10.1007/s11356-018-3552-3	・チュニジアの地中海沿岸にある Bizerte ラグーン流域の農家周辺を対象に、4 地点の水試料と底質を採取し、農薬残留分析を実施。 ・チュニジアにおける特定の期間、場所、条件について代表的なモニタリングデータであり、日本の代表的な使用方法/使用条件における評価に使用できない
24	Ⅱ8	Lackmann, C; Velki, M; Bjedov, D; Ecimovic, S; Seiler, TB; Hollert, H	2021	Commercial preparations of pesticides exert higher toxicity and cause changes at subcellular level in earthworm Eisenia andrei	Environmental Sciences Europe, 33 (1) http://dx.doi.org/10.1186/s12302-021-00455-5	・エスフェンバレレート(製剤 Sumialfa)、チアクロプリド(製剤 Calypso)、ジメテナミド-p(製剤 Frontier)、プロスルホカルブ(製剤 Filon)の有効成分とそれぞれの市販製剤をろ紙接触試験で 48 時間ばく露したアンドレツリミミズ *Eisenia andrei* に及ぼす影響を評価 ・リスク評価対象生物種ではない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
25	I 5	Celar, FA; Kos, K	2022	Compatibility of the commercial biological control agents Trichoderma asperellum (ICC 012) and Trichoderma gamsii (ICC 080) with selected herbicides	Journal of Plant Diseases and Protection, 129 (1), 85-92 http://dx.doi.org/10.1007/s41348-021-00547-7	・アミドスルフロン、ジカンバ、フルアジホップ-P-ブチル、フルロクロリドン、ホラムスルフロン、イソキサフルトール、メトリブジン、ペンディメタリン、プロスルホカルブ、ピリデート、s-メトラクロール、テンボトリオンを拮抗菌 *Trichoderma asperellum* (ICC012) 及び *Trichoderma gamsii* (ICC080)に処理し、菌糸成長に対する *in vitro* 影響を調査 ・薬効試験
26	I 5	Akhter, MJ; Abdurruhman, AM; Mathiassen, SK; Kudsk, P	2021	Low effectiveness of prosulfocarb and mesosulfuron-methyl	Plants-Basel, 10 (6) http://dx.doi.org/10.3390/plants10061186	・プロスルホカルブ及びメソスルフロン＋ヨードスルフロンのナギナタガヤ *Vulpia myuros* に対する効果を評価 ・薬効試験
27	I 5	Brunton, DJ; Boutsalis, P; Gill, G; Preston, C	2021	Inheritance of evolved thiocarbamate resistance in rigid ryegrass (Lolium rigidum) populations from Australia	Weed Science, 69 (6), 642-647 http://dx.doi.org/10.1017/wsc.2021.43	・オーストラリア南部のライグラス *Lolium rigidum* の耐性個体と感受性個体の交配を行い、プロスルホカルブに対する耐性を評価 ・薬剤耐性 ・薬効試験
28	I 5	Busi, R; Goggin, DE; Onofri, A; Boutsalis, P; Preston, C; Powles, SB; Beckie, HJ	2020	Loss of trifluralin metabolic resistance in Lolium rigidum plants exposed to prosulfocarb recurrent selection	Pest Management Science, 76 (12), 3926-3934 http://dx.doi.org/10.1002/ps.5993	・プロスルホカルブ継代反復処理による選抜をライグラス *Lolium rigidum* で行い、トリフルラリン代謝及び耐性に及ぼす影響を評価 ・薬剤耐性 ・薬効試験
29	I 5	Augustin, B; Weinheimer, S	2018	Efficiency and crop compatibility of different herbicides in Solanum sisymbriifolium	28th German Conference on Weed Biology and Weed Control, 458, 209-213 http://dx.doi.org/10.5073/jka.2018.458.030	・学会講演概要

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
30	I 5	Brunton, DJ; Boutsalis, P; Gill, G; Preston, C	2020	Control of thiocarbamate-resistant rigid ryegrass (Lolium rigidum) in wheat in southern Australia	Weed Technology, 34 (1), 19-24 http://dx.doi.org/10.1017/wet.2019.72	・南オーストラリアの Paskeville と Arthurton で圃場実験を行い、小麦におけるチオカルバメート耐性ライグラスの防除に有効な除草剤の選択肢を調査 ・薬効試験
31	I 5	Shergill, LS; Fleet, B; Preston, C; Gill, G	2016	Management of ACCase-inhibiting herbicide-resistant smooth barley (Hordeum glaucum) in field pea with alternative herbicides	Weed Technology, 30 (2), 441-447 http://dx.doi.org/10.1614/WT-D-15-00099.1	・ピロキサスルホン、プロスルホカルブ＋S-メトラクロール、ジメテナミド-P、プロピザミド、トリフルラリン単独あるいはトリアレートまたはジウロンとの併用、イマザモックスを Smooth barley に施用して、効果及び薬害を評価 ・薬効試験
32	-	Ambrozy, T; Maciejczyk, M; Klimek, AT; Wiecha, S; Stanula, A; Snopkowski, P; Palka, T; Jaworski, J; Ambrozy, D; Rydzik, L; Cynarski, W	2020	The effects of intermittent hypoxic training on anaerobic and aerobic power in boxers	International Journal of Environmental Research and Public Health, 17 (24) http://dx.doi.org/10.3390/ijerph17249361	・当該有効成分、代謝物には関連性がない
33	I 5	Brunton, DJ; Boutsalis, P; Gil, G; Preston, C	2018	Resistance to multiple pre herbicides in a field-evolved rigid ryegrass (Lolium rigidum) population	Weed Science, 66 (5), 581-585 http://dx.doi.org/10.1017/wsc.2018.31	・南オーストラリア州 Eyre Peninsula の圃場で発生したライグラス *Lolium rigidum* 耐性集団（EP162）と 2 つの感受性集団（SLR4、VLR1）について、用量反応試験を実施 ・薬効試験
34	I 5	Busi, R; Powles, SB	2016	Cross-resistance to prosulfocarb plus S-metolachlor and pyroxasulfone selected by either herbicide in Lolium rigidum	Pest Management Science, 72 (9), 1664-1672 http://dx.doi.org/10.1002/ps.4253	・西オーストラリア州のランダム調査で収集した ライグラス *Lolium rigidum* の個体群を用い、プロスルホカルブ＋S-メトラクロールまたはピロキサスルホンに対する耐性を調査 ・薬効試験

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
35	I 5	Celar, FA; Kos, K	2016	Effects of selected herbicides and fungicides on growth, sporulation and conidial germination of entomopathogenic fungus Beauveria bassiana	Pest Management Science, 72 (11), 2110-2117 http://dx.doi.org/10.1002/ps.4240	・フルアジナム、プロピネブ、水酸化第 2 銅、メチラム、、クロロタロニル、マンコゼブ及び除草剤（イソキサフルトール、フルアジホップ-P-ブチル、フルロクロリドン、ホラムスルフロン、プロスルホカルブの *in vitro* 殺菌効果について調査 ・薬効試験
36	I 5	Brunton, DJ; Boutsalis, P; Gill, G; Preston, C	2019	Resistance to very-long-chain fatty-acid (VLCFA)-inhibiting herbicides in multiple field-selected rigid ryegrass (Lolium rigidum) populations	Weed Science, 67 3, 267-272 http://dx.doi.org/10.1017/wsc.2018.93	・オーストラリア南部の作付地域の圃場から得られたライグラス *Lolium rigidum* の 5 耐性集団及び感受性集団について、オカルバメート系、クロロアセタミド系及びスルホニルイソキサゾリン系除草剤への用量反応試験を実施 ・薬効試験
37	-	Jamerlan, A; Dominguez, J; Ligsay, A; Youn, YC; An, SSA; Kim, SY	2019	Current fluid biomarkers, animal models, and imaging tools for diagnosing chronic traumatic encephalopathy	Molecular & Cellular Toxicology, 15 (4), 353-368 http://dx.doi.org/10.1007/s13273-019-0039-3	・総説 ・当該有効成分、代謝物には関連性がない
38	-	Maluk, M; Ferrando-Molina, F; Del Egido, LL; Langarica-Fuentes, A; Yohannes, GG; Young, MW; Martin, P; Gantlett, R; Kenicer, G; Hawes, C; Begg, GS; Quilliam, RS; Squire, GR; Young, JPW; Iannetta, PPM; James, EK	2022	Fields with no recent legume cultivation have sufficient nitrogen-fixing rhizobia for crops of faba bean (Vicia faba L.)	Plant and Soil, 472 (1-2), 345-368 http://dx.doi.org/10.1007/s11104-021-05246-8	・当該有効成分、代謝物には関連性がない

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
39	I 5	Busi, R; Beckie, HJ	2021	Are herbicide mixtures unaffected by resistance? A case study with Lolium rigidum	Weed Research, 61 (2), 92-99 http://dx.doi.org/10.1111/wre.12453	・ライグラス *Lolium rigidum* の 140 の圃場個体群を 14 の除草剤処理でスクリーニングし、効果及び耐性を調査 ・薬効試験
40	-	Sabic, H; Kious, B; Boxer, D; Fitzgerald, C; Riley, C; Scholl, L; McGlade, E; Yurgelun-Todd, D; Renshaw, PF; Kondo, DG	2019	Effect of altitude on veteran suicide rates	High Altitude Medicine & Biology, 20 (2), 171-177 http://dx.doi.org/10.1089/ham.2018.0130	・当該有効成分、代謝物には関連性がない
41	-	Honigman, B; Valley, M; Lowenstein, SR	2019	Editorial comment on: Effect of Altitude on Veteran Suicide Rates by Sabic et al. (From: Sabic H, Kious B, Boxer D, Fitzgerald C, Riley C, Scholl L, mcglade E, Yurgelun-Todd D, Renshaw PF, Kondo DG. High Alt Med Biol 2019;20:171-177; DOI: 10.1089/ham.2018.0130)	High Altitude Medicine & Biology, 20 (2), 178-180 http://dx.doi.org/10.1089/ham.2019.0058	・当該有効成分、代謝物には関連性がない ・科学的な査読付き論文ではない
42	I 5	Brunton, DJ; Boutsalis, P; Gill, G; Preston, C	2020	Varying responses of field-selected herbicide-resistant rigid ryegrass (Lolium rigidum) populations to combinations of phorate with PPI herbicides	Weed Science, 68 (4), 367-372 http://dx.doi.org/10.1017/wsc.2020.27	・特定の除草剤分解（チトクローム P450）酵素を阻害する有機リン酸系殺虫剤ホレート、チオカルバメート系除草剤トリアレートおよびプロスルホカルブを、野外で選抜したライグラス *Lolium rigidum* 集団に同時に処理して、3 種類の作用部位の除草剤に対する反応を検討 ・薬効試験

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
43	-	Chesmore, AA; Weiler, LM; Taussig, HN	2017	Mentoring relationship quality and maltreated children's coping	American Journal of Community Psychology, 60 (1-2), 229-241 http://dx.doi.org/10.1002/ajcp.12151	・当該有効成分、代謝物には関連性がない
44	I 5	Busi, R; Gaines, TA; Powles, S	2017	Phorate can reverse P450 metabolism-based herbicide resistance in Lolium rigidum	Pest Management Science, 73 (2), 444-451 https://doi.org/10.1002/ps.4441	・有機リン酸系殺虫剤ホレートと 5 種類の除草剤との相乗作用と拮抗作用を、耐性ライグラス *Lolium rigidum* 集団で調査 ・薬効試験
45	I 5	Busi, R; Gaines, TA; Powles, S	2017	Phorate can reverse P450 metabolism-based herbicide resistance in Lolium rigidum	Pest Management Science, 73 (2), 410-417 http://dx.doi.org/10.1002/ps.4441	・有機リン酸系殺虫剤ホレートと 5 種類の除草剤との相乗作用と拮抗作用を、複数の除草剤に耐性を持つライグラス *Lolium rigidum* 集団で調査 ・薬効試験
46	I 5	Babineau, M; Mathiassen, SK; Kristensen, M; Holst, N; Beffa, R; Kudsk, P	2017	Spatial distribution of acetolactate synthase resistance mechanisms in neighboring populations of silky windgrass (Apera spica-venti)	Weed Science, 65 (4), 479-490 http://dx.doi.org/10.1017/wsc.2017.11	・過去にヨードスルフロンナトリウム塩耐性シルキーウィンドグラスが発見された圃場に隣接する圃場で採取したシルキーウィンドグラス 8 個体について、3 つの除草剤作用部位に対する耐性を調査 ・薬効試験
47	I 5	Torra, J; Montull, JM; Taberner, A; Onkokesung, N; Boonham, N; Edwards, R	2021	Target-site and non-target-site resistance mechanisms confer multiple and cross-resistance to ALS and ACCase Inhibiting herbicides in Lolium rigidum from Spain	Frontiers in Plant Science, 12 http://dx.doi.org/10.3389/fpls.2021.625138	・スペイン由来のライグラス *Lolium rigidum* に ALS 及び ACCase 阻害型除草剤を施用し、効果及び耐性を調査 ・薬効試験

表 13 適合性評価の第 2 段階で「適合しない」と判断した論文とその理由（WOSCC）続き

リスト No.	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
48	-	Xiao, LB; Fang, XQ; Zhao, WY	2018	Famine relief, public order, and revolts: Interaction between government and refugees as a result of drought/flood during 1790-1911 in the North China Plain	Regional Environmental Change, 18 (6), 1721-1730 http://dx.doi.org/10.1007/s10113-018-1298-6	・当該有効成分、代謝物には関連性がない
49	I 5	Ducker, R; Zollner, P; Parcharidou, E; Ries, S; Lorentz, L; Beffa, R	2019	Enhanced metabolism causes reduced flufenacet sensitivity in black-grass (Alopecurus myosuroides Huds.) field populations	Pest Management Science, 75 (11), 2996-3004 http://dx.doi.org/10.1002/ps.5414	・ノスズメノテッポウ *Alopecurus myosuroides* に対するフルフェナセット及び他の除草剤における防除効果と耐性の調査 ・薬効試験
50	I 5	Janusauskaite, D; Razbadauskiene, K	2021	Comparison of productivity and physiological traits of faba bean (Vicia faba L.) varieties under conditions of Boreal Climatic Zone	Agronomy-Basel, 11 (4) http://dx.doi.org/10.3390/agronomy11040707	・薬効試験 ・当該有効成分、代謝物には関連性がない

5.結果及び結論

プロスルホカルブ及び製品について、系統的な文献調査を実施した。文献検索は、Web of Science Core Collection（WOSCC）及び J-STAGE で実施した。検索対象期間は WOSCC が 2016 年 3 月 1 日～2022 年 1 月 31 日、J-STAGE が 2007 年 1 月 1 日～2022 年 1 月 31 日とした。

WOSCC を用いた文献検索の結果、化合物名で 875 件の文献がヒットし、さらに「評価対象となる影響に関する分類フィールド」及び「評価対象となる生物種等に関するキーワード」を合わせて検索し重複分を除外した総文献数は 50 件となった。この 50 文献について、表題と概要に基づく第 1 段階適合性評価は実施せずに、文献全文に基づく第 2 段階適合性評価を実施したが、適合性のある文献は認められなかった。

J-STAGE を用いた文献検索の結果、化合物名等で 16 件の文献がヒットし、さらに「4 分野に関連するキーワード」および「評価対象となる生物種等に関するキーワード」で絞り込みを行ったが、重複した文献はなく総文献数は 16 件となった。この 16 文献について、表題と概要に基づく第 1 段階適合性評価を実施したが、適合性のある文献は認められなかった。

当該有効成分は米国で農薬使用が認可されておらず、JMPR による評価も行われていないが、欧州では除草剤として登録があり、2022 年 9 月 13 日現在再評価中である。選抜した国際機関評価書に結果が引用されている文献は認められなかった。

以上の結果から検索対象期間中には、リスク評価に関連する公表文献は認められなかった。

6.参考文献

- ✓ EC (2006): Draft Assessment Report (DAR) Prosulfocarb, dated March 2006
- ✓ EC (2007): Review Report for the active substance prosulfocarb, SANCO/2824/07 – rev. 3, dated 9 October 2007
- ✓ EFSA (2007): Conclusion regarding the peer review of the pesticide risk assessment of the active substance prosulfocarb, dated 27 July 2007
- ✓ EFSA (2011): Guidance of EFSA: Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009. EFSA Journal 2011; 9(2): 2092
- ✓ EPA (2012): Guidance for considering and using open literature toxicity studies to support human health risk assessment. Office of Pesticide Programs, U.S. Environmental Protection Agency
- ✓ Klimisch H-J, Andreae M and Tillmann U (1997): A systematic approach for evaluating the quality of experimental toxicological and ecotoxicological data. Regulatory Toxicology and Pharmacology 25, 1-5
- ✓ OECD (2005): OECD guidance for industry data submissions on plant protection products and their active substances (dossier guidance), rev. 2, May 2005
- ✓ Schneider K, Schwarz M, Burkholder I, Kopp-Schneider A, Edler L, Kinsner-Ovaskainen A, Hartung T, Hoffmann S (2009): ToxRTool, a new tool to assess the reliability of toxicological data. Toxicology Letters 189, pp. 138-144
- ✓ 公表文献の収集、選択等のためのガイドライン（案） 令和 3 年 7 月 28 日
- ✓ 残留農薬の食品健康影響評価における公表文献の取扱いについて（令和 3 年 3 月 18 日農薬第一専門調査会決定）最終改正：令和 3 年 9 月 13 日
- ✓ 再評価における公表文献の提出について 令和 3 年 10 月 1 日付け 3 消安第 3460 号農林水産省消費・安全局長通知