



EUROPEAN COMMISSION  
HEALTH & CONSUMER PROTECTION DIRECTORATE-GENERAL

Directorate D - Food Safety: Production and distribution chain  
**Unit D.3 - Chemicals, contaminants and pesticides**

Carbendazim  
5032/VI/98 final  
5 January 2007

### Review report for the active substance **carbendazim**

finalised in the Standing Committee on the Food Chain and Animal Health at its meeting on  
3 March 2006  
in view of the inclusion of carbendazim in Annex I of Directive 91/414/EEC

## 1. Procedure followed for the re-evaluation process

This review report has been established as a result of the re-evaluation of carbendazim, made in the context of the work programme for review of existing active substances provided for in Article 8(2) of Directive 91/414/EEC concerning the placing of plant protection products on the market, with a view to the possible inclusion of this substance in Annex I to the Directive.

Commission Regulation (EEC) No 3600/92<sup>(1)</sup> laying down the detailed rules for the implementation of the first stage of the programme of work referred to in Article 8(2) of Council Directive 91/414/EEC, as last amended by Regulation (EC) No 2266/2000<sup>(2)</sup>, has laid down the detailed rules on the procedure according to which the re-evaluation has to be carried out. Carbendazim is one of the 90 existing active substances covered by this Regulation.

In accordance with the provisions of Article 4 of Regulation (EEC) No 3600/92, United Derivan SA on 5 July 1993, United Phosphorus Ltd on 26 July 1993, K&N Efthymiadis SA (*now Sinon*) on 19 July 1993, BASF AG on 13 July 1998, DuPont de Nemours (France) SA on 23 July 1993, AgrEvo GmbH (*now Bayer CropScience AG*) 27 July 1993, Barclay Chemicals on 27 June 1993, SANC on 23 July 1993, Iberotam on 26 July 1993, Industrias Químicas on 28 July 1993, Aragonesas Agro SA 27 July 1993, Pilar Ibérica SL on 23 July 1993, AgriChem on 15 July 1993, Elf Atochem on 26 July 1993, Portman Agrochemicals on 26 July 1993, Helm AG on 23 July 1993, Calliope SA on 21 July 1993, Industrias Afrasa on 27 July 1993, SA John & Stephen B. on 29 July 1993 and B.V. Luxan on 21 July 1993 notified to the Commission of their wish to secure the inclusion of the active substance carbendazim in Annex I to the Directive.

In accordance with the provisions of Article 5 of Regulation (EEC) No 3600/92, the Commission, by its Regulation (EEC) No 933/94<sup>(3)</sup>, as last amended by Regulation (EC) No 2230/95<sup>(4)</sup>, designated Germany as rapporteur Member State to carry out the assessment of

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<sup>1</sup> OJ No L 366, 15.12.1992, p.10.

<sup>2</sup> OJ No L 259, 13.10.2000, p.27.

<sup>3</sup> OJ No L 107, 28.04.1994, p.8.

<sup>4</sup> OJ No L 225, 22.09.1995, p.1.

carbendazim on the basis of the dossiers submitted by the notifiers. In the same Regulation, the Commission specified furthermore the deadline for the notifiers with regard to the submission to the rapporteur Member States of the dossiers required under Article 6(2) of Regulation (EEC) No 3600/92, as well as for other parties with regard to further technical and scientific information; for carbendazim this deadline was 31 October 1995.

Three dossiers were submitted to the rapporteur Member State. AgrEvo GmbH (*now Bayer CropScience AG*), on behalf of the carbendazim task force (comprising BASF and DuPont de Nemours), submitted a dossier which did not contain substantial data gaps, taking into account the supported uses. The second dossier submitted on behalf of AgriChem and B.V. Luxan was incomplete in 3 of 5 sections, and the third one of K&N Efthymiadis (*now Sinon*) in all sections. Therefore, AgrEvo GmbH (*now Bayer CropScience AG*) being the designated representative of the carbendazim task force, was considered to be the main data submitter. Barclay Chemicals officially withdrew their notification on 23 October 1995. No information has furthermore been submitted by third parties.

In accordance with the provisions of Article 7(1) of Regulation (EEC) No 3600/92, Germany submitted on 21 November 1997 to the Commission the report of its examination, hereafter referred to as the draft assessment report, including, as required, a recommendation concerning the possible inclusion of carbendazim in Annex I to the Directive. Moreover, in accordance with the same provisions, the Commission and the Member States received also the summary dossier on carbendazim from AgrEvo GmbH (*now Bayer CropScience AG*) on 10 February 1998.

In accordance with the provisions of Article 7(3) of Regulation (EEC) No 3600/92, the Commission forwarded for consultation the draft assessment report to all the Member States as well as to AgrEvo GmbH (*now Bayer CropScience AG*) being the designated representative of the carbendazim task force, on 9 December 1997.

The Commission organised an intensive consultation of technical experts from a certain number of Member States, to review the draft assessment report and the comments received thereon (peer review), in particular on each of the following disciplines:

- identity and physical /chemical properties ;
- fate and behaviour in the environment ;
- ecotoxicology ;
- mammalian toxicology ;
- residues and analytical methods ;
- regulatory questions.

The meetings for this consultation were organised on behalf of the Commission by the Pesticide Safety Directorate (PSD) in York, United Kingdom, from March to July 1998 and from February to September 2003.

The report of the peer review (i.e. full report) was circulated, for further consultation, to Member States and the main data submitter on 4 September 1998 for comments and further clarification.

In accordance with the provisions of Article 7(3) of Regulation (EEC) No 3600/92, the dossier, the draft assessment report, the peer review report (i.e. full report) and the comments and clarifications on the remaining issues, received after the peer review were referred to the **Standing Committee on the Food Chain and Animal Health**, and specialised working groups of this Committee, for final examination, with participation of experts from the 15

Member States. This final examination took place from July 1998 to December 2004, and was finalised in the meeting of the **Standing Committee** on 3 March 2006.

These documents were also submitted to the Scientific Committee on Plants for separate consultation. The report of this Committee was formally adopted on 23 March 2001 (SCP/BENOMY/002 – final, SCP/CARBEN/002 – final, SCP/THIOPHAN/002 - final<sup>5</sup>).

The present review report contains the conclusions of the final examination; given the importance of the draft assessment report, the peer review report (i.e. full report) and the comments and clarifications submitted after the peer review as basic information for the final examination process, these documents are considered respectively as background documents A, B and C to this review report and are part of it.

## **2. Purposes of this review report**

This review report, including the background documents and appendices thereto, has been developed and finalised in support of the Directive 2006/135/EC concerning the inclusion of carbendazim in Annex I to Directive 91/414/EEC, and to assist the Member States in decisions on individual plant protection products containing carbendazim they have to take in accordance with the provisions of that Directive, and in particular the provisions of article 4(1) and the uniform principles laid down in Annex VI.

This review report provides also for the evaluation required under Section A.2.(b) of the above mentioned uniform principles, as well as under several specific sections of part B of these principles. In these sections it is provided that Member States, in evaluating applications and granting authorisations, shall take into account the information concerning the active substance in Annex II of the directive, submitted for the purpose of inclusion of the active substance in Annex I, as well as the result of the evaluation of those data.

In accordance with the provisions of Article 7(6) of Regulation (EEC) No 3600/92, Member States will keep available or make available this review report for consultation by any interested parties or will make it available to them on their specific request. Moreover the Commission will send a copy of this review report (not including the background documents) to all operators having notified for this active substance under Article 4(1) of this Regulation.

The information in this review report is, at least partly, based on information which is confidential and/or protected under the provisions of Directive 91/414/EEC. It is therefore recommended that this review report would not be accepted to support any registration outside the context of Directive 91/414/EEC, e.g. in third countries, for which the applicant has not demonstrated to have regulatory access to the information on which this review report is based.

## **3. Overall conclusion in the context of Directive 91/414/EEC**

The overall conclusion from the evaluation is that it may be expected that plant protection products containing carbendazim will fulfill the safety requirements laid down in Article 5(1)(a) and (b) of Directive 91/414/EEC. This conclusion is however subject to compliance with the particular requirements in sections 4, 5, 6 and 7 of this report, as well as to the implementation

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<sup>5</sup> Opinion of the Scientific Committee on Plants regarding the inclusion of carbendazim in Annex I to Council Directive 91/414/EEC concerning the placing of plant protection products on the market

of the provisions of Article 4(1) and the uniform principles laid down in Annex VI of Directive 91/414/EEC, for each carbendazim containing plant protection product for which Member States will grant or review the authorisation.

Furthermore, these conclusions were reached within the framework of the uses which were proposed and supported by the main data submitter and mentioned in the list of uses supported by available data (attached as Appendix IV to this Review Report).

With particular regard to residues, the review has established that the residues arising from the proposed uses, consequent on application consistent with good plant protection practice, have no harmful effects on human or animal health. The Theoretical Maximum Daily Intake (TMDI; excluding water and products of animal origin) for a 60 kg adult is 16 % of the Acceptable Daily Intake (ADI), based on the FAO/WHO European Diet (1998). The calculation was done on basis of residue data and intended uses of carbendazim only. Additional intake from water and products of animal origin are not expected to give rise to intake problems.

The review has identified several acceptable exposure scenarios for operators, workers and bystanders, which require however to be confirmed for each plant protection product in accordance with the relevant sections of the above mentioned uniform principles.

The review has also concluded that under the proposed and supported conditions of use there are no unacceptable effects on the environment, as provided for in Article 4 (1) (b) (iv) and (v) of Directive 91/414/EEC, provided that certain conditions are taken into account as detailed in section 6 of this report.

#### **4. Identity and Physical/chemical properties**

The main identity and the physical/chemical properties of carbendazim are given in Appendix I.

The active substance shall comply with the FAO specification and there seem not to be reasons for deviating from that specification; the FAO specification is given in Appendix I of this report.

The review has established that for the active substance notified by the main data submitter AgrEvo GmbH (*now Bayer CropScience AG*), none of the manufacturing impurities considered are, on the basis of information currently available, of toxicological or environmental concern.

In accordance with the provisions of Article 13(5) of Directive 91/414/EEC, Germany is also satisfied, on the basis of the information currently available, that the substances notified by the other data submitters (K&N Efthymiadis (*now Sinon*), AgriChem B.V.) do not, in the meaning of Article 13(2) and (5) of the Directive, differ significantly in degree of purity and nature of impurities from the composition registered in the dossier submitted by the main data submitter.

#### **5. Endpoints and related information**

In order to facilitate Member States, in granting or reviewing authorisations, to apply adequately the provisions of Article 4(1) of Directive 91/414/EEC and the uniform principles laid down in Annex VI of that Directive, the most important endpoints were identified during the re-evaluation process. These endpoints are listed in Appendix II.

## **6. Particular conditions to be taken into account on short term basis by Member States in relation to the granting of authorisations of plant protection products containing carbendazim**

On the basis of the proposed and supported uses (as listed in Appendix IV), the following particular issues have been identified as requiring particular and short term attention from all Member States, in the framework of any authorisations to be granted, varied or withdrawn, as appropriate.

Therefore the Member States must pay particular attention for the protection of:

- aquatic organisms. An appropriate distance must be kept between treated areas and surface water bodies. This distance may depend of the application or not of drift reducing techniques or devices;
- earthworms. Conditions of authorisation shall include risk mitigation measures, such as the selection of the most appropriate combination of numbers and timing of applications, rates of application, and, if necessary, the degree of concentration of the active substance;
- birds and mammals. Conditions of authorisation shall include risk mitigation measures, such as a judicious timing of the application and the selection of those formulations which, as a result of their physical presentation or the presence of agents that ensure an adequate avoidance, minimise the exposure of the concerned species;
- operators, who must wear suitable protective clothing, in particular gloves, coveralls, rubber boots and face protection or safety glasses during mixing, loading, application and cleaning of the equipment, unless the exposure to the substance is adequately precluded by the design and construction of the equipment itself or by the mounting of specific protective components on such equipment;

## **7. List of studies to be generated**

No further studies were identified which were at this stage considered necessary in relation to the inclusion of carbendazim in Annex I under the current inclusion conditions.

Member States must ensure that the authorisation holders report at the latest on 31 March each year on incidences of operator health problems, which should be supplemented by sales data and a survey of use patterns, so that a realistic picture of the toxicological impact of carbendazim can be obtained

## **8. Information on studies with claimed data protection**

For information of any interested parties, Appendix III gives information about the studies for which the main data submitter has claimed data protection and which during the re-evaluation process were considered as essential with a view to annex I inclusion. This information is only given to facilitate the operation of the provisions of Article 13 of Directive 91/414/EEC in the Member States. It is based on the best information available to the Commission services at the time this review report was prepared; but it does not prejudice any rights or obligations of Member States or operators with regard to its uses in the implementation of the provisions of Article 13 of the Directive 91/414/EEC neither does it commit the Commission.

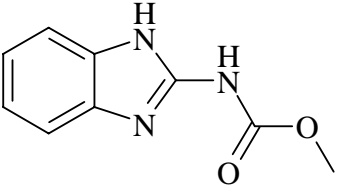
## **9. Updating of this review report**

The technical information in this report may require to be updated from time to time in order to take account of technical and scientific developments as well as of the results of the examination of any information referred to the Commission in the framework of Articles 7, 10 or 11 of Directive 91/414/EEC. Such adaptations will be examined and finalised in the Standing Committee on the Food Chain and Animal Health, in connection with any amendment of the inclusion conditions for carbendazim in Annex I of the Directive.

# APPENDIX I

## Identity, physical and chemical properties

### CARBENDAZIM

<b>Common name (ISO)</b>	Carbendazim
<b>Chemical name (IUPAC)</b>	Methyl benzimidazol-2-ylcarbamate
<b>Chemical name (CA)</b>	Methyl 1H-benzimidazol-2-ylcarbamate
<b>CIPAC No</b>	263
<b>CAS No</b>	10605-21-7
<b>EEC No</b>	EEC: 613-048-00-8; EINECS:234-232-0
<b>FAO SPECIFICATION</b>	AGP: CP/220 (1993); 980 ± 20 g/kg
<b>Minimum purity</b>	980 g/kg
<b>Molecular formula</b>	C <sub>9</sub> H <sub>9</sub> N <sub>3</sub> O <sub>2</sub>
<b>Molecular mass</b>	191.21
<b>Structural formula</b>	

<b>Melting point</b>	Above 302 – 307 °C (under decomposition)
<b>Boiling point</b>	Not applicable
<b>Appearance</b>	<u>Pure a.s.</u> : almost colourless crystalline solid, odourless; <u>Techn. a.s.</u> : sand-coloured to light grey crystalline powder, odourless
<b>Relative density</b>	1.45 at 20 °C
<b>Surface tension</b>	No surface active material
<b>Vapour pressure</b>	9 x 10 <sup>-5</sup> Pa (20 °C); 1.5 x 10 <sup>-4</sup> Pa (25 °C)
<b>Henry's law constant</b>	3.6 x 10 <sup>-3</sup> Pa m <sup>3</sup> mol <sup>-1</sup> (24 °C)
<b>Solubility in water</b>	<u>pH 4</u> : differs from 28 to 36 mg/l at ambient temperature <u>pH 7 - 8</u> : differs from 5 to 7 mg/l at ambient temperature
<b>Solubility in organic solvents</b>	All results in mg/l at 24 °C:  ethanol: 300 benzene: 36 hexane: insoluble - 0.5 ethyl acetate: 80.7 – 135 methylene chloride: 68 methanol: 359 – 480 acetone: 166 – 300 dimethyl-formamide: 5000 chloroform: 100 cyclohexane: < 10 diethylether: < 10 n-heptane: < 0.008 xylene: 2.16 1,2-dichloroethane: 36.6
<b>Partition co-efficient (log P<sub>ow</sub>)</b>	pH 4: 0.9 pH-range 5 - 9: 1.5
<b>Hydrolytic stability (DT<sub>50</sub>)</b>	pH 5: > 350 d (22 °C) pH 7: > 350 d (22 °C) pH 9: 124 d (22 °C)
<b>Dissociation constant</b>	pK <sub>a</sub> : 4.2
<b>Quantum yield of direct photo-transformation in water at λ &gt;290 nm</b>	Not submitted, not required
<b>Flammability</b>	Not highly flammable
<b>Explosive properties</b>	Not explosive
<b>UV/VIS absorption (max.)</b>	λ <sub>max.</sub> : 242.5 – 244 nm (ε=10.41 x 10 <sup>-3</sup> ); two smaller peaks at 279 – 280.5 nm and 285 – 288 nm (ε=14.67 x 10 <sup>-3</sup> )
<b>Photostability in water (DT<sub>50</sub>)</b>	Stable at pH 5

# APPENDIX II

## END POINTS AND RELATED INFORMATION

### CARBENDAZIM

#### 1 Toxicology and metabolism

##### Absorption, distribution, excretion and metabolism in mammals

Rate and extent of absorption:	Rapidly absorbed (ca 80 % based on urinary excretion and metabolites in faeces over 72 h)
Distribution:	Widely distributed; highest residues in liver and kidney
Potential for accumulation:	Low potential for accumulation (body half-life 12 h)
Rate and extent of excretion:	Rapidly excreted; predominantly in urine
Toxicologically significant compounds:	Parent compound (MBC) and metabolites
Metabolism in animals:	Completely metabolised, mainly to 5-hydroxymethyl benzimidazole carbamate (5-OH-MBC); conjugated as either glucuronides or sulfates

##### Acute toxicity

Rat LD <sub>50</sub> oral:	> 10000 mg/kg bw
Rat LD <sub>50</sub> dermal:	> 2000 mg/kg bw
Rat LC <sub>50</sub> inhalation:	> 5.6 mg/l air
Skin irritation:	Not irritant
Eye irritation:	Not irritant
Skin sensitization (test method used and result):	Non-sensitiser (Buehler; mod. Maximisation test)

##### Short term toxicity

Target / critical effect:	Liver (increased weight); testes (inhibition of spermatogenesis)
Lowest relevant oral NOAEL / NOEL:	90-d dog: 300 ppm (10 mg/kg bw/d)
Lowest relevant dermal NOAEL / NOEL:	10-d rabbit: 2000 mg/kg bw/d
Lowest relevant inhalation NOAEL / NOEL:	Not required

**Genotoxicity**

Numerical chromosome aberrations both <i>in vitro</i> and <i>in vivo</i> as a result of the interference with mitotic spindle proteins; threshold concentration for aneugenic activity <i>in vitro</i> between 0.2 – 0.6 µg/ml; NOEL for aneuploidy induction <i>in vivo</i> : 50 mg/kg bw
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**Long term toxicity and carcinogenicity**

Target / critical effect:

Liver (increased weight); testes (inhibition of spermatogenesis)
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Lowest relevant NOAEL:

2-y rat: 500 ppm (22 mg/kg bw/d)
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Carcinogenicity:

Enhanced liver tumours in two mice strains, no increased tumour incidences in a third strain and in both rat studies.
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**Reproductive toxicity**

Target / critical effect - Reproduction:

Decreased pup weights, decreased male fertility, hormonal effects.
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Lowest relevant reproductive NOAEL / NOEL:

Rat: 2000 ppm (100 mg/kg bw/d)
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Target / critical effect - Developmental toxicity:

At maternal toxic doses teratogenic effects, at lower dose levels embryo/fetotoxicity.
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Lowest relevant developmental NOAEL / NOEL:

Rat, rabbit: 10 mg/kg bw/d
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**Delayed neurotoxicity**

Acute clinical signs but no histological evidence of neuropathy
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**Other toxicological studies**

Evidence of liver enzyme induction; minor effects on cellular respiratory function; interference with the mitotic spindle proteins; no teratogenicity concern for dietary exposure.
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**Medical data**

No evidence of adverse effects to workers in manufacturing plants, agricultural workers and consumers.
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**Summary**

	Value	Study	Safety factor
ADI:	0.02 mg/kg bw	based on developmental studies in rats and rabbits	500
AOEL systemic:	0.02 mg/kg bw/d	based on developmental studies in rats	500
ARfD (acute reference dose):	0.02 mg/kg bw	based on developmental studies in rats and rabbits	500

**Dermal absorption**

10%
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## 2 Fate and behaviour in the environment

### 2.1 Fate and behaviour in soil

#### Route of degradation

##### Aerobic:

Mineralization after 100 days:

30 - 36 % after 244 to 270 d

Non-extractable residues after 100 days:

70 - 73 % after 28 d

57 % after 244 d

Major metabolites above 10 % of applied active substance: name and/or code % of applied rate (range and maximum)

2-AB, 4 - 8 % after 250 d

#### Supplemental studies

##### Anaerobic:

Conversion to 2-AB

##### Soil photolysis:

Indication for photolysis on glass plates

##### Remarks:

none

#### Rate of degradation

##### Laboratory studies

DT<sub>50lab</sub> (20 °C, aerobic):

25 - 502 d (n = 8)

DT<sub>90lab</sub> (20 °C, aerobic):

111 d (n = 1)

DT<sub>50lab</sub> (10 °C, aerobic):

28 - 36 d at 15 °C

DT<sub>50lab</sub> (20 °C, anaerobic):

250 - 302 d

##### Field studies (country or region)

DT<sub>50f</sub> from soil dissipation studies:

DT<sub>50f</sub>: ≈ 18 d (n = 4, )Germany)

DT<sub>90f</sub> from soil dissipation studies:

DT<sub>90f</sub>: 234 d (n = 4, Germany)

Soil accumulation studies:

Not required as DT<sub>90f</sub>: < 1 y  
(carbendazim dossier)

Soil residue studies:

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##### Remarks:

e.g. effect of soil pH on degradation rate

none

**Adsorption/desorption** $K_f / K_{oc}$ :

6 – 6.3 / 200 – 246

 $K_d$ :

Stronger adsorption on clay minerals expected.

pH dependence:

Stronger adsorption at low pH.

**Mobility****Laboratory studies:**

Column leaching:

&lt; 2 % of applied dose on leachate

Aged residue leaching:

Not submitted, not required.

**Field studies:**

Lysimeter/Field leaching studies:

Not submitted or required.

**Remarks:**

none

## 2.2 Fate and behaviour in water

### Abiotic degradation

Hydrolytic degradation:

pH 5: > 350 d at 22 °C/ stable  
pH 7: > 350 d at 22 °C/ stable  
pH 9: 22 – 124 d at 22 °C

Major metabolites:

Stable

Photolytic degradation:

Stable

Major metabolites:

Stable

### Biological degradation

Readily biodegradable:

No

Water/sediment study:

Bickenbach

Unter Widdersheim

DT<sub>50</sub> water:

10.8 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.995)

5.8 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.965)

DT<sub>90</sub> water:

36.0 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.995)

19.3 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.965)

DT<sub>50</sub> whole system:

16.1 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.989)

73.6 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.994)

DT<sub>90</sub> whole system:

53.5 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.989)

244.4 d  
(1<sup>st</sup> order; r<sup>2</sup>= 0.994)

Distribution in water / sediment systems  
(active substance)

Bickenbach

Unter Widdersheim

99.0 % in water at t = 0

103.2 % in water at t = 0

84.1 / 13.0 % in water /  
sediment after 3 d

54.7 / 36.7 % in water /  
sediment after 3 d

67.0 / 14.3 % in water /  
sediment after 7 d

36.8 / 51.7 % in water /  
sediment after 7 d

33.4 / 14.9 % in water /  
sediment after 21 d

18.8 / 63.4 % in water /  
sediment after 21 d

2.3 / 7.4 % in water /  
sediment after 42 d

5.4 / 51.6 % in water /  
sediment after 42 d

0.5 % / n.a. \* in water /  
sediment after 149 d

n.a.\* / 33.4 in water /  
sediment after 149 d

\* not analysed because radiocarbon  
concentration was below 5 % AR

Distribution in water / sediment systems  
(metabolites)

2-AB:

6.3 % in sediment after 76 d (Unter Widdersheim)

Accumulation in water and/or sediment:

No accumulation expected.

**Degradation in the saturated zone**

Not submitted or required.

**Remarks:**

none

**2.3 Fate and behaviour in air****Volatility**

Vapour pressure:

 $9 \times 10^{-5}$  Pa (20 °C);  $1.5 \times 10^{-4}$  Pa (25 °C)

Henry's law constant:

 $3.6 \cdot 10^{-3}$  Pa·m<sup>3</sup>·mol<sup>-1</sup> (24 °C)**Photolytic degradation**

Direct photolysis in air:

Not submitted or required

Photochemical oxidative degradation in air

calculation according to Atkinson  
(AOP, ver. 1.51)DT<sub>50</sub>:DT<sub>50</sub> = 0,606 h (12 h-day)refers to OH–reaction in the troposphere,  
long range transport is excluded

Volatilisation:

from plant surfaces: negligible

from soil: negligible

**Remarks:**

none

### 3 Ecotoxicology

#### Terrestrial Vertebrates

Acute toxicity to mammals:

Reproductive toxicity to mammals

Acute toxicity to birds:

Dietary toxicity to birds:

Reproductive toxicity to birds:

LD <sub>50</sub> >5000 mg/kg (dog)
NOEC <sub>parental/repro</sub> = 100 mg/kg bw/d (rat, 3 generation reproduction) NOEL 22.5 mg/kg/d (estimated NOAEL for developmental effects under feeding conditions)
LD <sub>50</sub> >2250 mg/kg (bobwhite quail)
LC <sub>50</sub> ca. 5000 ppm = 615 mg/kg bw/d (mallard duck)
NOEL 322 ppm benomyl (equivalent to 212 ppm carbendazim = 26.4 mg/kg bw/ d (mallard duck))

#### Aquatic Organisms

Acute toxicity fish:

Long term toxicity fish:

Acute toxicity invertebrate:

Chronic toxicity invertebrate:

Acute toxicity algae:

Chronic toxicity sediment dwelling organism:

Species	Time scale	Toxicity (mg /l)	Endpoint
<i>Cyprinus carpio</i>	96 h (st)	0.44	LC <sub>50</sub>
<i>O. mykiss</i>	96 h (st)	0.83	LC <sub>50</sub>
<i>O. mykiss</i>	79 d (fl) ELS	0.011	NOEC (embryo mortality)
<i>D. magna</i>	48 h (st)	0.15	EC <sub>50</sub>
<i>D. magna</i>	21 d (ss)	0.0015	NOEC (reproduction)
<i>S. subspicatus</i>	72 h (st)	> 8.0	EC <sub>50</sub>
<i>C. riparius</i>	28 d (st)	0.0133*	NOEC (emergence)

\* calculated active substance value, because test substance was 500 SC-formulation

#### Honeybees

Acute oral toxicity:

Acute contact toxicity:

48-h LD <sub>50</sub> > 756 µg/bee (360 SC formulation)
48-h LD <sub>50</sub> > 50 µg/bee (technical)

**Other arthropod species**

Species	Stage	Test Substance	Dose (kg a.s./ha)	Endpoint	Effect %	Annex VI Trigger
<b>Laboratory tests</b>						
Parasitoid wasps						
<i>Aphidius matricariae</i>	Adults	SC 360 g as/L	0.36	Parasitization	39	30 %
<i>Aphidius rhopalosiphi</i>	Adults	SC 500 g as/L	3.0	Mortality Parasitisation	4 0 (+ 30)	30 %
<i>Aphidius rhopalosiphi</i>	Adults	WG 500 g as/L	1.0	Mortality Parasitisation	10 30.9)	30 %
<i>Diaretiella rapae</i>	Adults	SC 360 g as/L	0.36	Parasitisation Mortality	9.5 9.5	30 %
Predatory mites						
<i>Amblyseius potentillae</i>	Larvae Adults	SC 360 g as/L	0.06 (calculated, not report.)	Mortality Fertility Overall	100	30 %
<i>Typhlodromus pyri</i>	Proto- nymphs	SC 500 g as/L	0.03 0.60	Fertility Fertility	2.2 1.3	30 %
Plant dwelling predators						
<i>Chrysoperla carnea</i>	Larvae Adults	SC 360 g as/L	0.36	Mortality Fertility Overall	-10.2 15.1	30 %
<i>Chrysoperla carnea</i>	Larvae	WG 500 g as/L	1.0	Mortality Fertility	4.0 29	30 %
<i>Coccinella septempunct.</i>	Larvae Adults	SC 360 g as/L	0.36	Mortality Fertility Overall	7.2 54.7 58.2	30 %
<i>Episyrphus balteatus</i>	Larvae Adults	SC 360 g as/L	0.36	Mortality Fertility Overall	29.3 100 100	30 %
Ground dwelling predators						
<i>Aleochara bilineata</i>	Larvae Adults	SC 360 g as/L	0.36	Parasitisation	19.1	30 %
<i>Aleochara bilineata</i>	Larvae Adults	WG 500 g as/L	0.5	Parasitisation	5.3	30 %
<i>Poecilus cupreus</i>	Adults	SC 360 g as/L	0.36	Mortality	3.3	30 %
<b>Field or semi-field tests</b>						
No data						

**Earthworms**

Acute toxicity:

LC <sub>50</sub>	5.4 mg as/kg (14 d)
	3.9 mg as/kg (28 d)

Reproductive toxicity:

NOEC	1.0 mg as/kg
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**Soil micro-organisms**

Nitrogen mineralization:

No effects up to 1.8 kg as/ha
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Carbon mineralization:

No effects up to 1.5 kg as/ha
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**APPENDIX IIIA****CARBENDAZIM**

List of studies for which the main submitter has claimed data protection and which during the re-evaluation process were considered as essential for the evaluation with a view to Annex I inclusion.<sup>6</sup>

**B.1 Identity, B.2 Physical and chemical properties, B.3 Data on application and further information, B.4 Proposals for classification and labelling, B.5 Methods of analysis**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from com- pany) Company<sup>7</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports<sup>8</sup> on previous use in granting national au- thorizations</b>
AIIA-2.3.1	Grewer	1987	Determination of the vapour pressure of HOE 017411 of ZB99 0004 as a function of the temperature. AVO A38118 not GLP, unpublished LUF95-00128	-
AIIA-2.3.2	Weller, O.	1991	Volatility from water / Henry-constant. AVO OE91/080; A46097 not GLP, unpublished LUF95-00129	-
AIIA-2.9.1; AIIA-7.2.1.1; AIIA-7.2.1.4	Priester, T.M.	1995	Hydrolysis of Carbendazim [2-14C]. AVO AMR-265-84; A52842 not GLP, unpublished WAS95-00185	-
AIIA-2.9.1; AIIA-7.2.1.1	Purser, D.	1987	Carbendazim: Behaviour in water. AVO 5330-269/12; A52843 not GLP, unpublished WAS95-00186	-

<sup>6</sup> Prepared by RMS, without further analysis, on the basis of a list provided by the main data submitter

<sup>7</sup> Only notifier listed

<sup>8</sup> Reports received from Member States at the date of finalisation of the present review report (not exhaustive)

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>7</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports<sup>8</sup> on previous use in granting national authorizations</b>
AIIA-2.9.2; AIIA-7.2.1.2	Schwab, W.	1992	HOE 017411-(Carbendazim)-14C, Photoabbau im Wasser. AVO CB92/017; A47539 not GLP, unpublished WAS95-00187	-
AIIA-2.9.4	Appel, M.	1988	HOE 017411/Carbendazim - Determination of the dissociation constants (pK values). AVO OC 01-88; A42938 not GLP, unpublished WAS95-00188	-
AIIA-2.10; AIIA-7.2.2	Gleisberg	1991	Abschätzung der Reaktivität organischer Moleküle mit OH-Radikalen der Troposphäre nach Atkinson (1988). AVO A46060 not GLP, unpublished LUF95-00130	-

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH

AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz

**B.6 Toxicology and metabolism**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from com- pany) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports on previous use in granting national au- thorizations</b>
AIIA-5.8.2	Kochendoer- fer, U.	1993	In vitro effects of carbendazim technical on the mitotic spindle A51927 Generated by: Hoechst L Toxikologie, Germany	-

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH

**B.7 Residue data**

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIA-6.1	Cicotti, M.	1987	Determination of DPX-H6573, its two phenyl metabolites and MBC in spring rape seeds (carry over study). AVO BG-BF-87-03; A52931 GLP, unpublished RIP95-00943	-
AIIA-6.1	Cicotti, M.	1986	Determination of DPX-H6573, its two phenyl metabolites and MBC in winter wheat grain (carry over study). AVO A52930 GLP, unpublished RIP95-00942	-
AIIA-6.1	Han, J.C.-Y.	1994	Characterization of residues in bean plants following foliar spray applications with Methyl 2-14C-Benzimidazolecarbamate (MBC). AVO A52926 not GLP, unpublished RIP95-00940	-
AIIA-6.1	Monson, K.D.	1986	Metablism of [2-14C]Carbendazim in laying hens. AVO AMR-264-84; A52934 not GLP, unpublished RIP95-00941	Evaluated and used in the UK to grant/maintain national authorizations during national review conducted 1992 UK ref.: SC8880/146

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIA-6.1	Rhodes, B.C.	1984	Greenhouse crop rotation study with [2-14C]Carbendazim. AVO AMR 495-86; A52929 not GLP, unpublished RIP95-00939	Evaluated and used in the UK to grant/maintain national authorisations during national review conducted 1992 UK ref: SC8880/144-
AIIA-6.1	Rhodes, R.C., Pease, H.L. and Holt, R.F.	1995	Greenhouse studies on crop uptake of MBC and 2-AB from soil. AVO A52928 not GLP, unpublished RIP95-00944	-
AIIA-6.2; AIIA-6.4	Hughes, D.L.	1985	Residue study of the fungicide MBC in lactating dairy cattle. AVO AMR 429-85; 6129-108; A52920 not GLP, unpublished RIP95-00961	-
AIIA-6.2; AIIA-6.4	Johnson, J.D.	1988	Determination of the plateau level of bound [Phenyl(U)-14C]Carbendazim residues in goat liver. AVO AMR 779-87; A52933 GLP, unpublished RIP95-00951	-
AIIA-6.2; AIIA-6.4	Monson, K.D.	1985	Metabolism of [2-14C]-Carbendazim in the lactating dairy cow. AVO AMR 248-84; A52932 not GLP, unpublished RIP95-00950	Evaluated and used in the UK to grant/maintain national authorisations during national review conducted 1992 UK ref: 880/145-



Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIA-6.3	Schollmeier, M. and Petersen, J.W.	1995	Residue data summary from supervised trials in sugar beets. AVO PSR95/013; A53862 not GLP, unpublished RIP95-00947	-
AIIA-6.9	Hollander and Kramer	1977	Peroral administration of Carbendazim = Hoe 17411 0 F AT002 to laying hens for determination of residues in eggs. AVO 316/77; A16743 not GLP, unpublished RIP95-00960	-

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH

AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz

BAS: BASF Aktiengesellschaft

**B.8 Environmental fate and behaviour**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from com- pany) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports on previous use in granting national au- thorizations</b>
AIIA-7.1.1.2.1; AIIIA-9.1.1.1	Otto, S.	1975	Verhalten des Pflanzenschutzmittel- wirkstoffes im Boden. AVD A22991 not GLP, unpublished BOD95-00442	-
AIIA-7.1.1.2.1; AIIIA-9.1.1.1	Gildemeister, H., Jordan, H.J. and Remmert, U.	1981	Behaviour of the plant protection product HOE 17411 OF AT 102 (Carbendazim) in soil SS 2.2 at 15°C, 20°C and 25°C. AVO (B) 125/81; A16743 not GLP, unpublished BOD95-00446	-
AIIA-7.1.1.2.1	Otto, S.	1976	Crop rotation studies with lettuce and radishes on soil containing aged residues of Carbendazime (2- Methoxycarbonylamino-benzimidazole). AVO LAB. NO. 1357; A07562 not GLP, unpublished BOD95-00443	-
AIIA-7.1.1.2.2; AIIIA-9.1.1.2	Krebs, B. und Baedelt, H.	1990	Untersuchung des Abbaues im Boden unter Freilandbedingungen. AVO DEU88F10621; A42437 not GLP, unpublished BOD95-00449	-
AIIA-7.1.1.2.2; AIIIA-9.1.1.2	Krebs, B. und Baedelt, H.	1990	Untersuchung des Abbaues im Boden unter Freilandbedingungen. AVO DEU88F10611; A42438 not GLP, unpublished BOD95-00450	-
AIIA-7.1.1.2.2; AIIIA-9.1.1.2	Krebs, B. und Baedelt, H.	1990	Untersuchung des Abbaues im Boden unter Freilandbedingungen. AVO DEU88F10631; A42436 not GLP, unpublished BOD95-00448	-

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports on previous use in granting national authorizations</b>
AIIA-7.1.1.2.2; AIIIA-9.1.1.2	Krebs, B. und Baedelt, H.	1990	Untersuchung des Abbaues im Boden unter Freilandbedingungen. AVO DEU88F10641; A42435 not GLP, unpublished BOD95-00447	-
AIIA-7.1.2	Görlitz, G. and Klöckner, Ch.	1986	HOE 017411, Adsorption/desorption in the soil/water system. AVO (B)136/85; A40783 not GLP, unpublished BOD95-00451	-
AIIA-7.1.3.1	Gildemeister, H. und Jordan, H.J.	1981	Versickerungsverhalten des Pflanzenbehandlungsmittels. AVO (B) 10/81; A20913 not GLP, unpublished BOD95-00453	-
AIIA-7.1.3.1; AIIIA-9.1.2.1	Rhodes, R.C. and Long, J.D.	1995	Run-off and Leaching studies with Methyl 2-14C-Benzimidazolecarbamate on soil. AVO A52922 not GLP, unpublished BOD95-00455	-
AIIA-7.1.3.1; AIIIA-9.1.2.1	Spitzer, T. and Bürkle, W.L.	1990	Hoe 017411-14C/Hoe 093049-14C (Carbendazim/Diethofencarb) - Leaching test in LUFA standard soils 2.1, 2.2 and 2.3 in accordance with BBA- Richtlinie IV, 4-2. AVO CB89/157; A47460 not GLP, unpublished BOD95-00454	-
AIIA-7.2.1.1	Görlitz, G. and Klöckner, Ch.	1982	Behaviour of plant protection agents in water. AVO (B) 63/82; A47455 not GLP, unpublished WAS95-00192	-
AIIA-2.9.1; AIIA-7.2.1.1; AIIA-7.2.1.4	Priester, T.M.	1995	Hydrolysis of Carbendazim [2-14C]. AVO AMR-265-84; A52842 not GLP, unpublished WAS95-00185	-

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports on previous use in granting national authorizations</b>
AIIA-2.9.1; AIIA-7.2.1.1	Purser, D.	1987	Carbendazim: Behaviour in water. AVO 5330-269/12; A52843 not GLP, unpublished WAS95-00186	-
AIIA-2.9.2; AIIA-7.2.1.2	Schwab, W.	1992	HOE 017411-(Carbendazim)-14C, Photoabbau im Wasser. AVO CB92/017; A47539 not GLP, unpublished WAS95-00187	-
AIIA-7.2.1.3.1	Voelskow, H.	1990	Testing the biodegradability of Carbendazim. AVO V 89-0464-A1B; A47420 not GLP, unpublished WAS95-00190	-
AIIA-7.2.1.3.1	Wellens	1984	Biological degradation of HOE 017411, active ingredient in Derosal. AVO OEK-W83-309; A47513 not GLP, unpublished WAS95-00189	-
AIIA-7.2.1.3.2	Gildemeister, D.	1988	Degradation of Carbendazim (HOE 017411) in Two Aerobic Aquatic Systems. AVO RCC 088132; 88/0150; A37801 not GLP, unpublished WAS95-00191	-
AIIA-7.2.2	Brüstell, H., Ulrich, C. und Werner, H.-J.	1993	Untersuchung des Verflüchtungsverhaltens nach einmaliger obengenannter Formulierung in Buschbohnen als Modellpflanze. AVO ER91DEU150; A49963 not GLP, unpublished LUF95-00132	-

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIA-7.2.2	Bürstell, H., Ulrich, C. und Werner, H.-J.	1993	Carbendazim (360 g/l) - Code: HOE 017411 00 SC32 A209: Untersuchung des Verflüchtigungsverhaltens nach einmaliger Anwendung oben genannter Formulierung auf Boden im Freiland. AVO ER91DEU151; A49957 not GLP, unpublished LUF95-00131	-
AIIA-2.10; AIIA-7.2.2	Gleisberg	1991	Abschätzung der Reaktivität organischer Moleküle mit OH-Radikalen der Troposphäre nach Atkinson (1988). AVO A46060 not GLP, unpublished LUF95-00130	-

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH

AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz

BBA: Biologische Bundesanstalt für Land-und Forstwirtschaft

**B.9 Ecotoxicology**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>	<b>Reports on previous use in granting national authorizations</b>
AIIIA-10.5	Decker, U.	1992	The effects of Larval and Pupal Exposure to HOE 017411 00 SC 32 A 209 on <i>Coccinella septempunctata</i> L. (Coleoptera: Coccinellidae) in the Laboratory. AVO A49497 GLP, unpublished ANA96-00049	-
AIIIA-10.5	Decker, U.	1992	The effects of Larval and Pupal Exposure to HOE 017411 00 SC 32 A 209 on <i>Chrysoperla carnea</i> Steph. (Neuroptera: Chrysopidae) in the Laboratory. AVO A48779 GLP, unpublished ANA96-00048	-
AIIIA-10.5	Decker, U.	1991	The effects of HOE 017411 00 SC 32 A 209 on Imagines of <i>Poecilus cupreus</i> L. (COLEOPTERA; CARABIDAE) in the laboratory. AVO A47376 GLP, unpublished ANA96-00047	-
AIIIA-10.5	Kühner, C.	1993	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf den Kurzflügelkäfer, <i>Aleochara bilineata</i> Gyll. (Coleoptera, Staphilinidae) im Labor. AVO A50089 GLP, unpublished ANA96-00054	-
AIIIA-10.5	Kühner, C.	1993	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf die Blatt-schlupfwespe, <i>Diaeretilla rapae</i> McIntosh (Hym., Aphidiidae) im Labor. AVO A50088 GLP, unpublished ANA96-00055	-

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIIA-10.5	Kühner, C.	1992	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf den Großen Siebenpunkt Marienkäfer, <i>Coccinella septempunctata</i> L. im Labor. AVO A49235 GLP, unpublished ANA96-00051	-
AIIIA-10.5	Kühner, C.	1992	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf die Florfliege, <i>Chrysoperla carnea</i> Steph. im Labor. AVO A47706 GLP, unpublished ANA96-00050	-
AIIIA-10.5	Petto, R.	1993	Effects of HOE 017411 00 SC 32 A 209 on <i>Aphidius matricariae</i> HAL. (Hymenoptera, Aphidiidae) in laboratory. AVO A51539 GLP, unpublished ANA96-00056	-
AIIIA-10.5	Petto, R. Klepka, S.	1992	Effects of HOE 017411 00 SC32 A209 on the reproduction of <i>Aleochara bilineata</i> Gyll. (Coleoptera, Staphylinidae) in laboratory. AVO A47598 GLP, unpublished ANA96-00052	-
AIIIA-10.5	Pietrzik, J.	1992	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf den Laufkäfer <i>Poecilus cupreus</i> L. im Labor. AVO A47500 GLP, unpublished ANA96-00053	-

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company, report no. GLP or GEP status (where relevant), published or not BVL registration number	Reports on previous use in granting national authorizations
AIIIA-10.5	Tornier, I.	1993	Erfassung der Nebenwirkungen von HOE 017411 00 SC32 A209 auf die Larven der Schwebfliege <i>Episyrphus balteatus</i> (DEG.) im Labor. AVO A52225 GLP, unpublished ANA96-00057	-

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH

AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz

BAY: Bayer CropScience

**APPENDIX III B****CARBENDAZIM**

List of studies which were submitted during the evaluation process and were not cited in the draft assessment report:

**B.1 Identity, B.2 Physical and chemical properties, B.3 Data on application and further information, B.4 Proposals for the classification and labelling, B.5 Methods of analysis**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>9</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-1.9; AIIA-1.10; AIIA-1.11	Bloxham, P. A.	2001	Carbendazim: Analysis and Certification of Product Ingredients for Technical Grade Carbendazim Produced by Suzhou Worldbest Agro-Biochemical Co., Ltd. At the Jiangsu Manufacturing Facility Report no. DuPont-6623 (Report plus Confidential Attachment) DPB GLP, unpublished CHE2002-467
AIIA-1.9; AIIA-1.10; AIIA-1.11	Bloxham, P.A.	2001	Validation of Analytical Methods to Verify the Certified Limits of Technical Grade Carbendazim (DPX-E0965) Report no. DuPont-6621 (Report plus Confidential Attachment). DPB GLP, unpublished CHE2002-470
AIIA-1.9; AIIA-1.10; AIIA-1.11	Schneider, E.	2000	Determination of HAP (2-Hydroxy-3-Amino-Phenazine) and of DAP (2,3-Diamino-Phenazine) in 5 batches Carbendazim tec. Report no. PR00/004 plus Amendment - UCL GmbH. DPB GLP, unpublished CHE2002-469
AIIA-1.9; AIIA-1.10; AIIA-1.11	Schneider, V.	2000	Determination of the Purity (by means of Determination of Impurities) and the Content of 5 Batches Carbendazim technical PR00/016 plus Amendment - UCL GmbH. DPB GLP, unpublished CHE2002-468

<sup>9</sup> Only notifier listed

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>9</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-1.11	Weller, O.	1998	Carbendazim (AE F017411 00 1D99): Content of HAP (3-Amino-2-hydroxyphenazine) in five actual production batches. AVO C001383 not GLP, unpublished CHE1999-689
AIIIA-2.7	Martinez, J. Rexer, K.	2001	Determination of the Storage Stability (Two Years Shelf Life at Room Temperature) Carbendazim water miscible suspension concentrate 500 g/l. AVD C013663 not GLP, unpublished PHY2002-294
AIIIA-2.8.2	Martinez, J. Rexer, K.	1999	Determination of the Persistence of Foam Carbendazim water miscible suspension concentrate 500 g/l AVO FOR 0558 (25) 01; C006254 not GLP, unpublished PHY2000-94
AIIIA-2.8.8	Martinez, J. Rexer, K.	1999	Determination of the Pourability Carbendazim water miscible suspension concentrate 500 g/l FOR 0558 (46) 01; C006256 not GLP, unpublished PHY2000-95
AIIA-4.2.2	Smith, B.	1997	Development and validation of a method of analysis for the quantitation of carbendazim in soil; SIN SNG 37/963405 not GLP, unpublished MET1999-1135
AIIA-4.2.3	Meeuwssen, M.C.T.J.	2001	Validation of the determination of carbendazim in water using HPLC, AGC TNO Report V3222 not GLP, unpublished MET2001-131

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>9</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-4.2.3	Smith, B.	1996	Development and validation of a method of analysis for the quantitation of carbendazim in water; SIN SNG 35/953175 not GLP, unpublished MET1999-1136
AIIA-4.2.3	Taylor, N.W.	2000	Enforcement method with validation for surface water by HPLC, AVD EM C05/99-0; C004482 not GLP, unpublished MET2000-715
AIIA-4.2.4	Flack, I.	1997	Carbendazim; Determination of a method of analysis in air; SIN SNG 34/963787 not GLP, unpublished MET1999-1137
AIIA-4.2.5	Leenheers, L.H.; Engel, R.; Spruit, W.E.T.; Meuling, W.J.A.; Jongen, M.J.M.	1993	Determination of methyl 5-hydroxy-2-benzimidazole carbamate in urine by high-performance liquid chromatography with electrochemical detection. SIN not GLP, unpublished MET1999-1134
AIIA-4.2.5	Todd, M.A.	1998	The development and validation of methods of analysis for the determination of carbendazim in animal tissues and produce SIN SNG 036/982198 not GLP, unpublished MET1999-1138
AIIIA-1.4	Bascou, J. Ph.	2002	Minor change statement for the Carbendazim SC Formulation: "Derosal"; Code: AE F017411 00 SC42 A2. AVD C022474 not GLP, unpublished BEI2002-281
AIIIA-2.7	Martinez, J. Rexer, K.	2001	Determination of the Storage Stability (Two Years Shelf Life at Room Temperature) Carbendazim water miscible suspension concentrate 500 g/l. AVD C013663 not GLP, unpublished PHY2002-294

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>9</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIIA-2.8.2	Martinez, J. Rexer, K.	1999	Determination of the Persistence of Foam Carbendazim water miscible suspension concentrate 500 g/l. AVO FOR 0558 (25) 01; C006254 not GLP, unpublished PHY2000-94
AIIIA-2.8.8	Martinez, J. Rexer, K.	1999	Determination of the Pourability Carbendazim water miscible suspension concentrate 500 g/l. AVO FOR 0558 (46) 01; C006256 not GLP, unpublished PHY2000-95
AIIIA-4.2	Evans, R.G.	1999	Recommended procedures for the decontamination of agricultural and horticultural spraying equipment and personal protective equipment following the use of Derosal 500 SC / Carbendazim 500 g/l SC. AVO C004995 not GLP, unpublished PHY2000-96
AIIIA-4.2	Frießleben, R.	2002	Instructions/Recommendations for tank cleaning after application of EXP11104A; Code: AE F01741100 SC42 A2. AVD C018467 not GLP, unpublished PHY2002-295

**Codes of company**

AGC: AgriChem B.V.  
 AVD: Aventis CropScience Deutschland GmbH  
 AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz  
 BAS: BASF Aktiengesellschaft  
 DPB: DuPont de Nemours (Deutschland) GmbH  
 SIN: SINON EU CORPORATION

**B.6 Toxicology and metabolism**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>10</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-5.2.1	McRae, L.A.	1997	Carbendazim technical - Acute oral toxicity to the rat. SIN SNG 93/970614/AC not GLP, unpublished TOX98-51537
AIIA-5.2.2	McRae, L.A.	1997	Carbendazim technical - Acute dermal toxicity to the rat. SIN SNG 50/970760/AC not GLP, unpublished TOX98-51538
AIIA-5.2.3	Jackson, G.C.	1997	Carbendazim technical - Acute inhalation study in rats (4-hour exposure). SIN SNG 102/972901 not GLP, unpublished TOX98-51544
AIIA-5.2.4	Parcell, B.I.	1997	Carbendazim technical - Skin irritation to the rabbit. SIN SNG 95/970644/SE not GLP, unpublished TOX98-51539
AIIA-5.2.5	Parcell, B.I.	1997	Carbendazim technical - Eye irritation to the rabbit. SIN SNG 96/970742/SE not GLP, unpublished TOX98-51540
AIIA-5.2.6	Coleman, D.G.	1997	Carbendazim technical - Skin sensitisation in the guinea-pig. SIN SNG 97/970934/SS not GLP, unpublished TOX98-51541
AIIA-5.4	Adler, I.-D.	2001	Mouse sperm-fish assay with carbendazim. AVD FE-76628; DuPont-4533; C015455 not GLP, unpublished TOX2001-1403

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<sup>10</sup> Only notifier listed

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>10</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-5.4	Leist, K.-H.	2001	Annex II, Tier 1, Document L II, Section 3, Point 5.4 – Genotoxicity Carbendazim. AVD C019367 not GLP, unpublished TOX2001-1404
AIIA-5.4	Leist, K.-H. and Strutt, A.V.	1998	Threshold for aneuploidy - Carbendazim and related substances. AVO TOX98/0028; A67201 not GLP, unpublished TOX98-50896
AIIA-5.4	Marshall, R.R., Murphy, M., Kirkland, D.J. and Bentley, K.S.	1996	Fluorescence in situ hybridisation with chromosome-specific centromeric probes: a sensitive method to detect aneuploidy. Mutation Research, 372, 1996, 233-245 A67202 not GLP, published TOX98-50901
AIIA-5.4.1	Marshall, R.	1996	Benomyl: Induction of aneuploidy in cultured human peripheral blood lymphocytes. DPD CHE NO.: 550/26; HLO 1125-96; A67198 not GLP, unpublished TOX98-50900
AIIA-5.4.1	Adams, K.	1996	Carbendazim - Mammalian cell mutation assay. SIN SNG 76/963243 not GLP, unpublished TOX98-51543
AIIA-5.4.1; AIIA-5.4.2	Evans, R.G., Orme J.,P.,R.	1998	Toxicology and metabolism studies on carbendazim for which data protection is claimed in accordance with article 13 (3) d of directive 91/414/EEC. AVO not GLP, unpublished TOX98-50898
AIIA-5.4.1	Kitching, J.D.	1996	Carbendazim - Metaphase chromosome analysis of human lymphocytes cultured in vitro. SIN SNG 77/963550 not GLP, unpublished TOX98-51542

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>10</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-5.4.1	Marshall, R.	1996	Carbendazim: Induction of aneuploidy in cultured human peripheral blood lymphocytes. DPD CHE NO.: 550/27; HLO 506-96; A67199 not GLP, unpublished TOX98-50899
AIIA-5.8.2	Meuling, W.J.A., Opdam, J.J.G. and De Kort, W.L.A.M.	1998	Dose-excretion study with the fungicide carbendazim in volunteers. AVO A50719 not GLP, unpublished TOX98-50897
AIIA-5.9	Anonymous	1998	Repords of inspection on works surrounding. SIN not GLP, unpublished TOX98-51546
AIIA-5.9	Huang, C., Fang, Y., Lu, T., Lee, T. and Cheng, W.	1998	Records of medical check-up. SIN not GLP, unpublished TOX98-51545
AIIA-5.10	Strutt, A.V.	1998	Updated copy of the evaluation table Doc5033/VI/98 Rev.0 (21.05.1998) on Carbendazim AVO 5033/VI/98 not GLP, unpublished TOX98-50895
AIIIA-7.1.1	McRae, L.A.	1996	Carbendazim 500 g/l SC - Acute oral toxicity to the rat. SIN SNG 29A/952347/AC not GLP, unpublished TOX98-51547
AIIIA-7.1.2	McRae, L.A.	1996	Carbendazim 500 g/l SC - Acute dermal toxicity to the rat. SIN SNG 30A/952248/AC not GLP, unpublished TOX98-51548
AIIIA-7.1.4	Parcell, B.I.	1995	Carbendazim 500 g/l SC - Skin irritation to the rabbit. SIN SNG 31A/952653/SE not GLP, unpublished TOX98-51549

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>10</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIIA-7.1.5	Parcell, B.I.	1995	Carbendazim 500 g/l SC - Eye irritation to the rabbit. SIN SNG 32A/952767/SE not GLP, unpublished TOX98-51550
AIIIA-7.1.6	Allan, S.A.	1995	Carbendazim 500 g/l SC - Skin sensitisation in the guinea-pig. SIN SNG 33A/952864/SS not GLP, unpublished TOX98-51551
AIIIA-7.2.1.1	Brown, J.C.	2003	Position Paper Carbendazim: Submission of recalculated Operator Exposure Estimates DPD DuPont-13379 not GLP, unpublished

#### Codes of company

AVD: Aventis CropScience Deutschland GmbH  
 AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz  
 BAY: Bayer CropScience  
 SIN: SINON EU CORPORATION

**B.7 Residue data**

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>11</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIA-6.3; AIIIA-8.1	Welcker, H.	1998	Carbendazim SC (suspension concentrate) 500 g/l, Code: AE F017411 00 SC42 A204. Residue trials in wheat to determine carbendazim residues at harvet following three applications; Euro- pean union (northern zone), 1997. AVO ER97ECN101; A59515 GLP, unpublished RIP98-00755
AIIA-6.3; AIIIA-8.1	Welcker, H.	1998	Carbendazim SC = water miscible suspension con- centrate, 500 g/l, Code: AE F017411 00 SC42 A204. Residue trials in wheat to determine carbendazim residues at harvet following three applications; Euro- pean union (southern zone), 1997. AVO ER97ECS101; A59514 GLP, unpublished RIP98-00753
AIIA-6.3; AIIIA-8.1	Zietz, E.	1997	Carbendazim suspension concentrate, 500g/l Code: HOE 017411 00 SC42 A203 is identical to the new AgrEvo Code AE F017411 00 SC42 A203: Determination of the residues of Carbendazim in barley following treatment with Derosal SC 500 under field conditions in Spain, Southern France and Italy, 1996 AVO ER96ECS101; A58408 GLP, unpublished

<sup>11</sup> Only notifier listed

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>11</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIA-6.3; AIIIA-8.1	Zietz, E.	1997	Carbendazim suspension concentrate, 500g/l Code: HOE 017411 00 SC42 A203 is identical to the new AgrEvo Code AE F017411 00 SC42 A203: Determination of the residues of Carbendazim in barley following treatment with Derosal SC 500 under field conditions in England, Northern France and Germany, 1996 AVO ER96ECN101; A58409 GLP, unpublished
AIIA-6.3; AIIIA-8.1	Zietz, E.	1997	Carbendazim suspension concentrate, 500g/l Code: HOE 017411 00 SC42 A203 is identical to the new AgrEvo Code AE F017411 00 SC42 A203: Determination of the residues of Carbendazim in wheat following treatment with Derosal SC 500 under field conditions in Spain, Southern France and Italy, 1996 AVO ER96ECS102; A58406 GLP, unpublished
AIIA-6.3; AIIIA-8.1	Zietz, E.	1997	Carbendazim suspension concentrate, 500g/l Code: HOE 017411 00 SC42 A203 is identical to the new AgrEvo Code AE F017411 00 SC42 A203: Determination of the residues of Carbendazim in wheat following treatment with Derosal SC 500 under field conditions in England, Northern France and Germany, 1996 AVO ER96ECN102; A58407 GLP, unpublished
AIIA-6.3; AIIIA-8.1	Zietz, E.	1998	Determination of the residues of Carbendazim in barley (malting barley) and processed products (malt, beer, and pearl barley) following treatment with Derosal SC 500 under field conditions in England, northern France and Germany 1997. Interim Report AVO IF-97/03981-00; ER97ECN102; A67186 GLP, unpublished RIP98-00757

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>11</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIA-6.3; AIIA-6.5.2	Zietz, E.	1999	Determination of the residues of carbendazim in barley (malting barley) and processed products (malt, beer and pearl barley) following treatment with Derosal SC 500 under field conditions in England, northern France and Germany 1997. AVO IF-97/03981-00; ER97ECN 102; C005304 GLP, unpublished RIP2000-251
AIIA-6.5.1	Taylor, N. W.	2000	Carbendazim Analytical grade Code: AE F017411 Confirmation of analytical target following hydrolysis under representative (simulated) processing conditions. AVD RESID/99/39; Study Number 028/11/005; C006861 GLP, unpublished RIP2000-2201
AIIA-6.8; AIIIA-8.5	Ferreira, E.M.	1998	Proposal for Maximum Residue Levels (EU MRLs) for Carbendazim in Cereals, northern France and Germany 1997. AVO RESID/98/11 not GLP, unpublished RIP98-00760

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH  
 AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz  
 BAS: BASF Aktiengesellschaft

**B.8 Environmental fate and behaviour**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>12</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-7.1.1.2.2	Anonymous	1998	Carbendazim: Comparison of half-life calculations in soil under field conditions by non-linear regression analysis with the model KIM and the approach by TIMME, FREHSE and LASKA. AVO not GLP, unpublished BOD98-01087
AIIA-7.2.1.3.1	Kelly, C., Thirkettle, K.M. and Smith, B.	1996	Carbendazim Technical - Ready Biodegradability (Closed Bottle Test). EFT SNG 79/962943 GLP, unpublished WAS98-00574
AIIA-7.2.1.3.2	Kley, C.	2002	Kinetic evaluation of a water/sediment study with Carbendazim using TopFit 2.0. AVD C020879 not GLP, unpublished WAS2002-168
AIIA-7.2.1.3.2	Knoch, E.	2001	Degradability and Fate of [U-14C-phenyl]Carbendazim in the Aquatic Environment (Water/Sediment System). AVD C 017201, IF-99/23071-00 GLP, unpublished WAS2002-167
AIIIA-9.1.3	Schäfer, D.	2002	Calculation of PEC values in soil for the fungicide carbendazim under European conditions AVD OE02/163; C026510 not GLP, unpublished BOD2002-725
AIIIA-9.2.1	Kley, C. Tarara, G.	2002	Addendum to Document A67913: Simulation of the leaching behaviour using the leaching model PELMO 2.01 AVD C026511 not GLP, unpublished

<sup>12</sup> Only notifier listed

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>12</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIIA-9.2.3	Kley, C.	2002	Predicted Environmental Concentrations in surface water and sediment (PEC <sub>sw</sub> , PEC <sub>sed</sub> ) for the fungicide Carbendazim for application in Europe. AVD C020880 not GLP, unpublished WAS2002-169

**Codes of company**

AVD: Aventis CropScience Deutschland GmbH  
AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz  
EFT: K & N Efthymiadis SA

**B.9 Ecotoxicology**

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>13</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-8.1.1	Rodgers, M.	1996	Carbendazim technical: Acute oral toxicity (LD50) to bobwhite quail. SIN SNG 65/952692 GLP, unpublished AVS98-00233
AIIA-8.1.2	Rodgers, M.	1996	Carbendazim technical: Subacute dietary toxicity (LD50) to bobwhite quail. SIN SNG 57/952152 GLP, unpublished AVS98-00235
AIIA-8.1.3	Frey, L.T., Grimes, J., Stence, M., Beavers, J.B. and Jaber, M.	1996	DPX-T1991-615,-529 (Benomyl): A reproduction study with the northern bobwhite ( <i>Colinus virginianus</i> ). DPD 112-391 GLP, unpublished AVS98-00210
AIIA-8.1.3	Frey, L.T., Stence, M., Beavers, J.B. and Jaber, M.	1996	DPX-T1991-615,-529 (Benomyl): A reproduction study with the mallard ( <i>Anas platyhynchos</i> ). DPD 112-392 GLP, unpublished AVS98-00211
AIIA 8.2	Kelly, C., Thirkettle, K., Smith, B., Graham, F.H.	1997	Carbendazim technical prolonged toxicity to <i>Daphnia magna</i> SIN SNG 80/970692 WAT 2000-565
AIIA-8.2.7; AIIIA-10.2.4	Sowig, P., Gosch, H.	2002	Chronic toxicity to the sediment dwelling chironomid larvae <i>Chironomus riparius</i> ; Carbendazim; water miscible suspension concentrate; 500 g/l. AVD CE01/093; C018793 GLP, unpublished WAT2002-316

<sup>13</sup> Only notifier listed

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>13</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIA-8.3.2; AIIIA-10.5.1	Baxter, I.	2000	Carbendazim; 500 g/l; Suspension concentrate Toxicity of the fungicide AE F017411 00SC42 A2 to the parasitoid <i>Aphidius rhopalosiphi</i> in a laboratory test. AVD ENVIR/005CN; C008372 GLP, unpublished ANA2002-273
AIIA-8.3.2; AIIIA-10.5.1	Künast, C.	1995	Effect of BAS 346 21 F on the Lacewing <i>Chrysopa</i> ( <i>Chrysoperla</i> ) <i>carnea</i> ( <i>Chrysopidae</i> , <i>Neuroptera</i> ) in Laboratory Trials. BBA BASF95/10343 GLP, unpublished ANA2001-278
AIIA-8.3.2; AIIIA-10.5.1	Sowig, P.	2001	Comparative survey of the effects of carbendazim on <i>Chrysopa</i> ( <i>Neuroptera</i> : <i>Chrysopidae</i> ). AVD OE 01/055; C012895 GLP, unpublished ANA2002-275
AIIA-8.3.2; AIIIA-10.5.1	Sowig, P.	2001	Statement on the effects of Carbendazim on non-target arthropods. AVD OE 01/135; C017370 GLP, unpublished ANA2002-272
AIIA-8.3.2; AIIIA-10.5.1	Waltersdorfer, A.	2000	Toxicity to the predatory mite <i>Typhlodromus pyri</i> Scheuten ( <i>Acari</i> , <i>Phytoseiidae</i> ) in the laboratory; Carbendazim; water miscible suspension concentrate; 500 g/l. AVD CW99/148; C008683 GLP, unpublished ANA2002-274
AIIA-8.4.1	Rodgers, M. H.	1996	Carbendazim technical: Acute toxicity (LC50) to the earthworm ( <i>Eisenia foetida</i> ). SIN SNG 58/950983 not GLP, unpublished ARW98-00096

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>13</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-8.4.2	Lührs, U.	2001	Effects of Derosal SC360 on reproduction and growth of earthworms <i>Eisenia fetida</i> (Savigny 1826) in artificial soil. BAY 9801022 GLP, unpublished ARW2003-100
AIIA-8.4.2	Lührs, U.	2002	Effects of Derosal SC 360 on reproduction and growth of earthworms <i>Eisenia fetida</i> in artificial soil. BAY 15071022 GLP, unpublished ARW2003-101
AIIA-8.4.2	Lührs, U.	2002	Effects of Derosal SC 360 on reproduction and growth of earthworms <i>Eisenia fetida</i> in artificial soils. BAY 12621022 GLP, unpublished ARW2003-99
AIIA-8.4.2	Lührs, U.	2003	Effects of Derosal SC 360 on reproduction and growth of earthworms <i>Eisenia fetida</i> in artificial soil. BAY 15071022 GLP, unpublished ARW2003-102
AIIA-8.4.2; AIIIA-10.6.1.2	Lührs, U.	2001	Carbendazim/ Flusilazole (DPX-N7872) SE (1:2): Effects on reproduction and growth of the earthworm, <i>Eisenia fetida</i> (Savigny 1826), in artificial soil. BAY 10111022 GLP, unpublished ARW2002-121
AIIA-8.5	Carter, J.N.	1995	Carbendazim technical grade ai: Effects on soil non-target micro-organisms. SIN SNG 27/951971 GLP, unpublished BMF98-00085

<b>Annex point/ reference number</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title source (where different from company) Company<sup>13</sup>, report no. GLP or GEP status (where relevant), published or not BVL registration number</b>
AIIA-8.5	McMurray, A.	1999	Carbendazim - Suspension concentrate 500 g/l: A laboratory assessment of the effects of AE F017411 00 SC42 A205 on soil microflora respiration and nitrogen transformation. AVO ENV4576 ! C005934 GLP, unpublished BMF2000-7
AIIA-8.6; AIIIA-10.8	Evans, R. G.;	1998	Statement on the biological activity of carbendazim against non-target species as determined in preliminary testing. AVO C001669 not GLP, unpublished PFL1999-92
AIIIA-10.1.1	Rodgers, M.	1996	Carbendazim 500g/l SC: Acute oral toxicity (LD50) to bobwhite quail. SIN SNG 66/961724 GLP, unpublished AVS98-00234
AIIIA-10.6.1	Van Gestel, C.A.M., Dirven-Van Breemen, E.M., Baerselman, R. Emans, H.J.B., Janssen, J.A.M., Posthuma, R., Van Vliet, P.J.M.	1992	Comparison of sublethal and lethal criteria for nine different chemicals in standardized toxicity tests using the Earth-worm <i>Eisenia andrei</i> . Ecotoxicology and Environmental Safety, 23, 1992, 206-220 not GLP, published ARW96-00039
AIIIA-10.6.1.1	Rodgers, M. H.	1996	Carbendazim 500 g/l SC: Acute toxicity (LC50) to the earthworm ( <i>Eisenia foetida</i> ). SIN SNG 67/961466 not GLP, unpublished ARW98-00097
AIIIA-10.6.1.2	Sowig, P.	2001	Effects on growth and reproduction of earthworms ( <i>Eisenia fetida</i> ) Carbendazim; watwe miscible suspension concentrate;500g/l Code: AE F017411 00 SC42 A208 AVD Rep-No.CE1/041; C014451 GLP, unpublished ARW2002-206

Annex point/ reference number	Author(s)	Year	Title source (where different from company) Company <sup>13</sup> , report no. GLP or GEP status (where relevant), published or not BVL registration number
AIIIA-10.6.2	Römbke, J., Foerster, B. and Schallnass, H.-J.	2001	Benomyl (DPX-T1991) 50WP: Effects on the decomposition of organic material in the field. DPD DuPont -1384 GLP, unpublished ARW2001-53
AIIIA-10.6.2	Sowig, P.	2001	Statement on the effect of Carbendazim on organic matter breakdown AVD C017369 GLP, unpublished
AIIIA-10.7.1	Carter, J.N.	1995	Carbendazim 500 g/l SC: Effects on soil non-target micro-organisms. SIN SNG 70/952677 GLP, unpublished BMF98-00086

### Codes of company

AVD: Aventis CropScience Deutschland GmbH  
 AVO: Hoechst Schering AgrEvo GmbH Zulassung Pflanzenschutz  
 BAY: Bayer CropScience  
 DPD: Dupont De Nemours (France) S.A.S  
 SIN: SINON EU CORPORATION

**APPENDIX IV****List of uses supported by available data****CARBENDAZIM**

Crop and/ or situation  (a)	Member State or Country	Product name	F G or I  (b)	Pests or Group of pests controlled  (c)	Formulation		Application				Application rate per treatment			PHI (days)  (l)	Remarks:  (m)
					Type  (d-f)	Conc. of as (i)	method kind (f-h)	growth stage & season (j)	number min max (k)	interval between applications (days)	kg as/hl  min max	water l/ha  min max	kg as/ha  min max		
<b>Wheat Rye Triticale</b>	EU (North)	*)	F	<i>Pseudocercospora herpetrichoides</i> <i>Septoria sodorum</i> <i>Fusarium culmorum</i> <i>Erysiphe graminis</i>	*)	*)	medium volume spraying	treatments at BBCH 32-49 and 60-69	2			200-600	0.250	42	
<b>Wheat Rye Triticale</b>	EU (South)	*)	F	<i>Pseudocercospora herpetrichoides</i> <i>Septoria sodorum</i> <i>Fusarium culmorum</i> <i>Erysiphe graminis</i>	*)	*)	medium volume spraying	treatments at BBCH 32-49 and 60-69	2			200-600	0.250	35	
<b>Barley Oats</b>	EU (North)	*)	F	<i>Pseudocercospora herpetrichoides</i> <i>Septoria sodorum</i> <i>Fusarium culmorum</i> <i>Erysiphe graminis</i>	*)	*)	medium volume spraying	treatments at BBCH 32-49 and 60-69	2			200-600	0.250	42	

Crop and/ or situation  (a)	Member State or Country	Product name	F G or I  (b)	Pests or Group of pests controlled  (c)	Formulation		Application				Application rate per treatment			PHI (days)  (l)	Remarks:  (m)
					Type  (d-f)	Conc. of as (i)	method kind (f-h)	growth stage & season (j)	number min max (k)	interval between applications (days)	kg as/ha min max	water l/ha min max	kg as/ha min max		
<b>Oilseed rape</b>	EU (North)	*)	F	<i>Sclerotinia sclerotiorum</i> <i>Cylindrosporium concentricum</i> <i>Cylindrosporium brassicae</i> <i>Alternaria brassicae</i>	*)	*)	medium volume spraying	Treatment at BBCH 71-75	1			150-600	0.500	42	
<b>Sugarbeet</b>	EU (North)	*)	F	<i>Cercospora beticola</i> <i>Erysiphe betae</i>	*)	*)	medium volume spraying	spray at appearance of first symptoms; second application to be applied 3 weeks later	2			300-600	0.075	49	
<b>Sugarbeet</b>	EU (South)	*)	F	<i>Cercospora beticola</i> <i>Erysiphe betae</i>	*)	*)	medium volume spraying	spray at appearance of first symptoms; second application to be applied 3 weeks later	2			300-600	0.0625	45	
<b>Maize</b>	EU (South)	*)	F	<i>Helminthosporium maidis</i> <i>Spacelotheca spp.</i>	*)	*)	medium volume spraying	beginning of tassel emergence to start of grain develop- ment	2			400-600	0.100	28	

\*) No specific formulation is listed as the supported uses have been drawn up following an evaluation of all relevant carbendazim-based straight products and co-formulations registered in the EU.

- (a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (e.g. fumigation of a structure)
- (b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
- (c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
- (d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
- (e) GCPF Codes - GIFAP Technical Monograph No 2, 1989
- (f) All abbreviations used must be explained
- (g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench

- (h) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plant - type of equipment used must be indicated
- (i) g/kg or g/l
- (j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
- (k) Indicate the minimum and maximum number of application possible under practical conditions of use
- (l) PHI - minimum pre-harvest interval
- (m) Remarks may include: Extent of use/economic importance/restrictions