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HEALTH & CONSUMER PROTECTION DIRECTORATE-GENERAL

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E1 - Plant health

Picoxystrobin

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COMMISSION WORKING DOCUMENT - DOES NOT NECESSARILY REPRESENT THE VIEWS OF THE COMMISSION SERVICES

Review report for the active substance **picoxystrobin**

Finalised in the Standing Committee on the Food Chain and Animal Health at its meeting on 4 July 2003 in view of the inclusion of picoxystrobin in Annex I of Directive 91/414/EEC.

1. Procedure followed for the evaluation process

This review report has been established as a result of the evaluation of the new active substance picoxystrobin, made in the context of the work provided for in Articles 5 and 6 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.

In accordance with the provisions of Article 6(2) of Directive 91/414/EEC, the Irish authorities received on 26 May 1999 an application from Zeneca Agrochemicals (now Syngenta), hereafter referred to as the applicant, for the inclusion of the active substance picoxystrobin in Annex I to the Directive. Irish authorities indicated to the Commission on 27 May 1999 the results of a first examination of the completeness of the dossier, with regard to the data and information requirements provided for in Annex II and, for at least one plant protection product containing the active substance concerned, in Annex III to the Directive. Subsequently, and in accordance with the requirements of Article 6(2), a dossier on picoxystrobin was distributed to the Member States and the Commission.

The Commission referred the dossier to the Standing Committee on the Food Chain and Animal Health in the meeting of the working group 'legislation' thereof on 10 June 1999, during which the Member States confirmed the receipt of the dossier.

In accordance with the provisions of Article 6(3), which requires the confirmation at Community level that the dossier is to be considered as satisfying, in principle, the data and information requirements provided for in Annex II and, for at least one plant protection product containing the active substance concerned, in Annex III to the Directive and in accordance with the procedure laid

down in Article 20 of the Directive, the Commission confirmed in its Decision 1999/555/EC [1] of 22 July 1999 that these requirements were satisfied.

Within the framework of that decision and with a view to the further organisation of the works related to the detailed examination of the dossier provided for in Article 6(2) and (4) of Directive 91/414/EEC, it was agreed between the Member States and the Commission that Ireland, as rapporteur Member State and the United Kingdom as co-rapporteur Member State, would carry out the detailed examination of the dossier and report the conclusions of the examination accompanied by any recommendations on the inclusion or non-inclusion and any conditions relating thereto, to the Commission as soon as possible and at the latest within a period of one year.

Ireland and the United Kingdom submitted to the Commission on 11 June 2001 the report of its detailed scientific examination, hereafter referred to as the draft assessment report, including, as required, a recommendation concerning the possible inclusion of picoxystrobin in Annex I to the Directive.

On receipt of the draft assessment report, the Commission forwarded it for consultation to all the Member States and the applicant on 23 July 2001.

Further discussion between the Rapporteur Member State and the Co-rapporteur Member State were organised , to review the draft assessment report and the comments received thereon 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 active substance was evaluated in the Co-rapporteur System. The meetings between the Rapporteur Member State and the Co-rapporteur Member State took place from November 2001 to April 2002.

The report of the peer review (i.e. the Reporting Table) was finalised and circulated, for further consultation, to Member States and the applicant on 7 March 2002.

The dossier, revised draft assessment report and the peer review report (i.e. full report) including in particular an outline resumé of the remaining technical questions, 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 September 2002 to July 2003, and was finalised in the meeting of the Standing Committee on 4 July 2003.

The present review report contains the conclusions of this final examination; given the importance of the revised draft assessment report, the peer review report (i.e. full report) and the comments and

[1] OJ L 210, 10.08.1999, p.22

clarifications submitted after the revision of the draft assessment report 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.

The review did not reveal any open questions or concerns, which would have required a consultation of the Scientific Committee on Plants.

2. Purposes of this review report

This review report, including the background documents and appendices thereto, have been developed and finalised in support of the Directive **2003/84/EC**[2] concerning the inclusion of Picoxystrobin in Annex I to Directive 91/414/EEC, and to assist the Member States in decisions on individual plant protection products containing picoxystrobin 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 parallel with the provisions of Article 7(6) of Regulation 3600/92 for existing active substances, the Commission and the 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 the applicant.

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

[2] OJ No L 247, 30.09.2003, p.20.

Furthermore, these conclusions were reached within the framework of the following uses which were proposed and supported by the sole submitter:

- fungicide for foliar application in cereals with a maximum application rate of 0.25 kg a.s. / ha.

Extension of the use pattern beyond those described above will require an evaluation at Member State level in order to establish whether the proposed extensions of use can satisfy the requirements of Article 4(1) and of the uniform principles laid down in Annex VI of Directive 91/414/EEC.

4. Specific conclusions which are highlighted in this evaluation

4.1 Residues of picoxystrobin in foodstuffs

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) for a 60 kg adult is 3,9 % of the Acceptable Daily Intake (ADI), based on the FAO/WHO European Diet (August 1994). This low intake value reflects the current limited use pattern for this active substance.

4.2 Exposure of operators, workers and bystanders

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

4.3 Ecotoxicology

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 7 of this report.

5. Identity and Physical/chemical properties

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

The active substance shall have a minimum purity of 950 g/kg technical product.

The review has established that for the active substance notified by the applicant, none of the manufacturing impurities considered are, on the basis of information currently available, of toxicological or environmental concern. However, current specification of the active substance is based on the production of the pilot plant. New data on 5 batch analysis have to be submitted at Member State level after full scale production of picoxystrobin has started.

6. 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 as identified during the evaluation process are listed in Appendix II.

7. 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 picoxystrobin

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

Member States

- should pay particular attention to the protection of groundwater, when the active substance is applied in regions with vulnerable soil and/or climate conditions.
- should pay particular attention to the protection of soil organisms.
- should pay particular attention to the protection of aquatic ecosystems.

Risk mitigation measures or monitoring programs should be applied where appropriate.
The Member States shall inform the Commission in accordance with Article 13(5) on the specification of the technical material as commercially manufactured.

8. List of studies to be generated

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

As outlined above, when granting authorisations Member States may require additional information to ensure adequate protection of ground water resources, e.g. field degradation studies or monitoring programs in critical regions. This may be particularly the case for the metabolites M3 and M8. Also possible effects on aquatic and soil organisms may require further investigations by experimental studies or monitoring projects.

As the current specification of the active substance is based on the production of the pilot plant, new data on 5 batch analysis have to be submitted to Member States after full scale production of picoxystrobin has started.

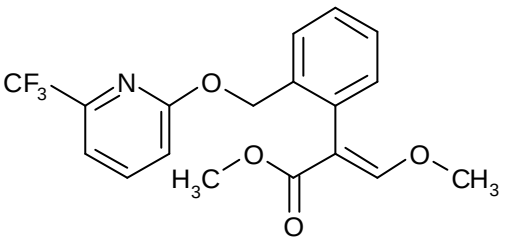
10. Updating of this review report

The technical information in this report may require periodic updating 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 picoxystrobin in Annex I of the Directive.

APPENDIX I

Identity, physical and chemical properties

PICOXYSTROBIN

Common name (ISO)	Picoxystrobin
Development Code (for new actives only)	ZA1963
Chemical name (IUPAC)	Methyl (E)-3-methoxy-2-{2-[6-(trifluoromethyl)-2-pyridyloxymethyl]phenyl} acrylate
Chemical name (CA)	Methyl (E)-α-(methoxymethylene)-2-[[[6-(trifluoromethyl)-2-pyridinyl]oxy]methyl]-benzeneacetate (9CI)
CIPAC No	628
CAS No	117428-22-5
EEC No	No information provided.
FAO SPECIFICATION	None defined.
Minimum purity	950 g/kg
Molecular formula	$C_{18}H_{16}F_3NO_4$
Molecular mass	367.3 g/mol
Structural formula	

Melting point	75°C.	
Boiling point	Not required.	
Appearance	A solid at 20°C with a creamy colour and no characteristic odour.	
Relative density	1.4g/cm^3 at 20°C.	
Vapour pressure	5.5x10^{-9} kPa at 20°C.	
Henry's law constant	6 x 10^{-4} Pa m^3/mole	
Solubility in water	3.1 mg/l at 20°C	
Solubility in organic solvents	Solvent	g/L at 20°C
	n-heptane	6 (RMS, please check unit)
	toluene	No data.
	1,2- dichloroethane	> 250
	Methanol.	96
	acetone	> 250
	ethyl acetate	>250
	Xylene	> 250
Partition co-efficient (log P_{ow})	The Log Po/w at 20°C = 3.6.	
Hydrolytic stability (DT_{50})	The half life of Picoxystrobin at 50°C and at pH 9 is estimated to be circa 15 days. Picoxystrobin is stable at pH 5 and 7.	
Dissociation constant	None.	
Quantum yield of direct photo-transformation in water at l >290 nm	0.48 (mean of 4 test results).	
Flammability	Picoxystrobin does not classify as flammable.	
Explosive properties	Picoxystrobin does not classify as explosive.	
UV/VIS absorption (max.)	The ε at 290nm = 433.	
Photostability in water (DT_{50})	Sterile solutions [circa 1.4ppm] of Picoxystrobin labelled in the Pyridinyl and Phenylacrylate rings were irradiated with artificial light (a Xenon lamp in a Heraeus Suntest instrument) for a time period equivalent of up to 30 days natural Summer sunlight at a latitude 50°N. Under the conditions of the study the half life of Picoxystrobin is estimated to be in the range 17 to 25 days depending on the label studied (notifier's estimate 20.3 days).	

APPENDIX II

END POINTS AND RELATED INFORMATION

PICOXYSTROBIN

1 Toxicology and metabolism

Absorption, distribution, excretion and metabolism in mammals

Rate and extent of absorption:	>75% within 48 h (bile-duct cannulated rats, low dose)
Distribution:	Initial wide distribution, highest residues in liver, kidneys, GIT, blood and bone (males only). Total: <1%, low dose, 5 days.
Potential for accumulation:	No potential for accumulation
Rate and extent of excretion:	>95% within 5 days (low dose); mainly bile/faecal (78% in males and 61% in females)
Toxicologically significant compounds:	Parent compound; 2-[6-(trifluoromethyl) pyridin-2-yloxymethyl]-benzoic acid (metabolite 8, soil); o-phthalic acid (metabolite 15, grain)
Metabolism in animals:	Complete metabolisation of absorbed dose; 34 of 42 metabolites found were identified; mainly ester hydrolysis and glucuronide conjugation.

Acute toxicity

Rat LD_{50} oral:	>5000 mg/kg bw
Rat LD_{50} dermal:	>2000 mg/kg bw
Rat LC_{50} inhalation:	>2.12 mg/l and <4.59 mg/l (4-h nose-only) R 20
Skin irritation:	Non-irritant
Eye irritation:	Non-irritant
Skin sensitization (test method used and result):	Not a skin sensitiser (M & K test)

Short term toxicity

Target / critical effect:	No specific target organ toxicity (rat, dog) Reduced bodyweight and food consumption/ utilisation efficiency at highest dose tested
Lowest relevant oral NOAEL / NOEL:	90-d & 1-yr dietary, dog: 4.3 mg/kg bw/d
Lowest relevant dermal NOAEL / NOEL:	28-d, rat: >1000 mg/kg bw/d (limit dose)

Lowest relevant inhalation NOAEL / NOEL:	Not a volatile compound therefore a short term inhalation toxicity study was not conducted.

Genotoxicity

Not genotoxic

Long term toxicity and carcinogenicity

Target / critical effect:	No significant target organ toxicity. Reduced bodyweight and food consumption at the highest dose tested (750 ppm)
Lowest relevant NOAEL:	2-yr, rat: 200 ppm (12.2 mg/kg bw/d)
Carcinogenicity:	No evidence of carcinogenicity

Reproductive toxicity

Target / critical effect - Reproduction:	No effects on reproductive performance; reduced body weights of offspring at the end of the lactation period at parentally toxic doses (750 ppm)
Lowest relevant reproductive NOAEL / NOEL:	2-gen, rat: >750 ppm (78.2 mg/kg bw/d), this being the highest dose tested; 200 ppm (parent rats)
Target / critical effect - Developmental toxicity:	Ossification delay and increased incidence of skeletal variants at maternally toxic doses
Lowest relevant developmental NOAEL / NOEL:	rat: 30 mg/kg bw/day rabbit: 25 mg/kg bw/day

Delayed neurotoxicity

Not an organophosphorus compound, therefore acute delayed neurotoxicity studies were not conducted. No evidence of neurotoxicity from other studies

Other toxicological studies

1,3-dihydro-isobenzofuran-3-one-1 carboxylic acid (Metabolite 24, wheat): Acute oral LD_{50}, rat: >2000 mg/kg bw NOAEL (28-d oral, rat): >1600 ppm (182 mg/kg bw/d) Genotoxicity, Ames test & cytogenetic assay: negative 2-methoxy-6-(trifluoromethyl)pyridine (Metabolite 26, soil): Acute inhalation LC_{50}, rat (4-h, nose only): >10.48 mg/l 2-[6-(trifluoromethyl)pyridin-2-yloxymethyl]-benzoic acid (Metabolite 8, soil): Acute oral LD_{50}, rat: 387 mg/kg bw. NOAEL (90-d oral, rat): 60 ppm (4.8 mg/kg bw/d) males; 600 ppm (53.3 mg/kg bw/day) females Genotoxicity, Ames test: negative

o-phthalic acid (Metabolite 15, grain): Survey of published literature (November 2000) Acute oral LD_{50}, rat: 7500-8400 mg/kg bw In-vitro genotoxicity (Ames test & cytogenetic assay in CHO cells): negative Dominant lethal test: questionable positive test result involving reduced male fertility and abnormal sperm morphology Non-carcinogenic in rats and mice according to NTP carcinogenicity programme Reduced foetal body weight and retarded ossification in rats at maternal toxic doses

Medical data

Limited; new compound. No detrimental effects reported for personnel involved in research, development or formulation

Summary

	Value	Study	Safety factor
ADI:	0.043	90-d & 1-yr dietary, dog	100
AOEL systemic:	0.043	90-d & 1-yr dietary, dog	100
ARfD (acute reference dose):	Not allocated. No relevant acute effects.		

Dermal absorption

In vivo, rat: <0.9% in 24 h (250 g/l formulation concentrate) 21% in 24 h (1:200 spray strength dilution) In vitro, rat and human: 17-26 fold higher absorption in rat skin preparation Human 24-h dermal absorption estimate: approx. 2%

2 Fate and behaviour in the environment

2.1 Fate and behaviour in soil

Route of degradation

Aerobic:

Mineralization after 100 days:	Study 1 in section B.8.1.1.1 pyridinyl label treatment: 17.9-32.5% (at 119 days) [n = 4]; phenyl label treatment: 29.9-42.8% (at 119 days) [n = 4] Study 2 in section B.8.1.1.1 phenyl label treatment: 42.1-54.4% (at 113 days) [n = 3] Study 3 in section B.8.1.1.1 pyridinyl label treatment: 13.4-22.0% (at 119 days) [n = 4] Study 4 in section B.8.1.1.1 pyridinyl label treatment: 22.95% (at 120 days) [n = 1] Sterile conditions (Study 5 in section B.8.1.1.1) – pyridinyl label treatment: 0% (at 70 days) [n = 1]
Non-extractable residues after 100 days:	Study 1 in section B.8.1.1.1 pyridinyl label treatment: 12.4-20.6% (at 119 days) [n = 4]; phenyl label treatment: 22.4-28.6% (at 119 days) [n = 4] Study 2 in section B.8.1.1.1 phenyl label treatment: 30.0-32.2% (at 113 days) [n = 3] Study 3 in section B.8.1.1.1 pyridinyl label treatment: 16.2-32.4% (at 119 days) [n = 4] Study 4 in section B.8.1.1.1 pyridinyl label treatment: 19.65% (at 120 days) [n = 1] Sterile conditions (Study 5 in section B.8.1.1.1) – pyridinyl label treatment: 6.8% (at 70 days) [n = 1]
Major metabolites above 10 % of applied active substance: name and/or code % of applied rate (range and maximum)	Major metabolites (>10%) detected in the studies were Compound 2 (up to 30.0%) and Compound 3 (up to 13.8%). Under flow-through incubation conditions (Studies 1-3), Compound 26 was detected in the trapping systems for volatile products, at levels up to 31.2% of applied radioactivity. In the study that used a static biometer flask incubation system (Study 4), Compound 26 was detected in both the soil and the flask atmosphere at maximum levels of 10.1% and 5.4% of applied radioactivity respectively.

Supplemental studies

Anaerobic:

	Mineralisation: up to 0.7%; non-extractable residues: up to

	12.1% [n = 1] Surface water: Compound 2 (maximum of 40.0%), Compound 3 (maximum of 0.8%) and Compound 8 (maximum of 0.4%) Soil phase: Compound 2 (maximum of 35.9%), Compound 3 (maximum of 0.6%), Compound 7 (maximum of 1.8%) and Compound 8 (maximum of 0.7%) Several minor unidentified components were detected; none of which individually accounted for more than 2%.
Soil photolysis:	Mineralisation: up to 32.2%; non-extractable residues: up to 8.6% [n = 1] Apart from carbon dioxide, Compound 3 (up to 28.3%) was the only major metabolite. Compounds 4, 8, 12, 13 and 15 were also detected, but at levels =6.6%. A number of minor unidentified degradation products were detected, none of which exceeded 3.2%. For irradiated samples, DT_{50} = 7 days of 50ºN summer sunlight (estimated with First Order Multi-Compartment model, r^2 = 0.87).
Remarks:	none

Rate of degradation

Laboratory studies

DT_{50}lab (20 °C, aerobic):	mean: 24 days; range: 19-33 days [n = 4]; r2 (range): 0.95-0.98 [FOMC]
DT_{90}lab (20 °C, aerobic):	mean: 116 days; range: 90-131 days [n = 4]; r2 (range): 0.95-0.98 [FOMC]
DT_{50}lab (10 °C, aerobic):	DT_{50calc} (10ºC, aerobic): 53 days (No laboratory value, extrapo from the mean FOMC-estimated DT_{50} value at 20ºC of 24 days
DT_{50}lab (20 °C, anaerobic):	Whole system: DT_{50} 43 days [n = 1]; r^2: 0.97 DT_{50} value for surface water phase 5 days [n = 1]; r^2: 0.99 [FOMC]

Field studies (country or region)

DT_{50f} from soil dissipation studies:	range: 3-35 days [n = 8]; mean: 20 days [FOMC] (France, Germany, UK)
DT_{90f} from soil dissipation studies:	range: 42-364 days [n = 8]; mean: 177 days [FOMC] (France, Germany, UK)
Soil accumulation studies:	ZA1963 degrades rapidly in soil. It is not expected to accumu in soil following normal agricultural use.
Soil residue studies:	On the basis of the results from the laboratory soil metabolism studies, the aerobic rate of degradation was determined for Compounds 2, 3 and 8:

	Compound 2 – DT_{50} (20ºC, aerobic): mean: 29 days; range: 9-51 days [n = 4] [unmodified Euler Method] Compound 3 – DT_{50} (20ºC, aerobic): mean: 15 days; range: 7-26 days [n = 3] [FOMC for 2 soils, linear first order kinetics for 1 soil] Compound 8 – DT_{50} (20ºC, aerobic): mean: 14 days; range: 11-20 days [n = 3] [FOMC for 2 soils, linear first order kinetics for 1 soil] Compound 8 – DT_{90} (20ºC, aerobic): mean: 160 days; range: 37-254 days [n = 3] [FOMC for 2 soils, linear first order kinetics for 1 soil]
Remarks: e.g. effect of soil pH on degradation rate	none

Adsorption/desorption

K_f / K_{oc}:	Freundlich adsorption coefficient, K': 3.6-22 µg/g (mean: 13.3 µg/g; 1/n: 0.96-1.01); K'$_{oc}$: 750-1200 µg/g (mean: 898 µg/g) [6 soils]
K_d:	Mean K_d values, covering five dose levels, were calculated for each soil. K_d: 3.5-24 ml/g; K_{oc} (K_d normalised to organic carbon): 790-1200 ml/g [6 soils]
pH dependence:	No

Mobility

Laboratory studies:

Column leaching:	Not required, as reliable adsorption coefficient values were obtained.
Aged residue leaching:	Not required, as reliable adsorption coefficient values were obtained.

Field studies:

Lysimeter/Field leaching studies:	Not required, based on PELMO modelling data.

Remarks:	none

2.2 Fate and behaviour in water

Abiotic degradation

Hydrolytic degradation:	pH 4 (50ºC): no significant hydrolysis pH 5 (25ºC): no significant hydrolysis pH 7 (25ºC, 50ºC): no significant hydrolysis pH 9 (25ºc): no significant hydrolysis
Major metabolites:	pH 9 (50ºc): dt_{50} = 16.5 days (linear first order kinetics, r^2 = 0.97); compound 2 (up to 32.1%) and compound 7 (up to 37.9%)
Photolytic degradation:	DT_{50} (pyridinyl label treatment) = 27.14 days of 50ºN summer sunlight (linear first order kinetics, r^2 = 0.702) DT_{50} (phenyl label treatment) = 22.40 days of 50ºn summer sunlight (linear first order kinetics, r^2 = 0.916) DT_{50} (mean) = 25 days of 50ºN summer sunlight
Major metabolites:	Compound 4 (maximum levels of 14.2% for pyridinyl label treatment and 11.7% for phenyl label treatment); Compound 12 (maximum levels of 15.3% for pyridinyl label treatment and 14.5% for phenyl label treatment) Mean quantum yield of ZA1963 = 0.48 (following irradiation a 280 ± 10 nm in acetonitrile/water, 50/50, at 20ºC). Under mid-European conditions, the environmental half-life was calculat to range from 110 days to 1000 years, depending upon seasor sunlight and depth of water. The corresponding environmen lifetimes ranged from 160 days to 1500 years.

Biological degradation

Readily biodegradable:	Study was not required
Water/sediment study:	
DT_{50} water: DT_{90} water:	7.5 days (Virginia Water); 10.5 days (Old Basing) 28 days (Virginia Water); 35 days (Old Basing) [Values for water column obtained by graphical interpolation of best-fit curves for the water compartment, resulting from fitting the experimental data to a two-compartment water/sediment model.]
DT_{50} whole system: DT_{90} whole system:	44.5 days (Old Basing); 67.4 days (Virginia Water) 117.5 days (Old Basing); 121.3 days (Virginia Water) [Old Basing: graphical interpolation of best-fit curves for the water and sediment compartments, obtained by fitting the experimental data to a two-compartment model. Virginia Water: application of zero order kinetics to the experimental data, r^2 = 0.99.]
Distribution in water / sediment systems (active substance)	<u>Old Basing</u> Pyridinyl phenyl 77.6/19.0 87.7/11.1 49.2/41.6 76.0/19.2 36.6/52.9 52.7/37.9

	53.0/37.2 50.4/39.1 58.6/30.2 53.8/35.5 14.4/56.7 22.8/58.0 9.2/39.1 12.8/38.9 3.1/18.4 2.2/22.2 1.2/10.0 1.3/11.9 <u>Virginia Water</u> Pyridinyl phenyl 86.3/10.9 93.4/ - 58.7/34.8 63.9/31.1 44.0/48.5 49.3/44.4 38.0/50.7 39.4/49.6 34.2/51.0 33.6/49.4 25.2/52.3 27.0/54.8 16.7/44.9 17.2/48.3 7.0/25.9 8.7/25.2 2.1/9.6 1.9/8.6
Distribution in water / sediment systems (metabolites)	<u>Compound 2 Old Basing</u> pyridinyl phenyl - / - - / - 0.9/0.3 - /0.1 1.7/0.9 1.4/0.6 1.5/0.8 1.3/0.7 1.7/1.3 1.7/0.9 10.9/7.8 7.7/4.7 19.7/14.0 17.8/14.2 30.5/23.3 33.2/27.4 37.4/29.8 38.2/30.7 <u>Compound 2 Virginia Water</u> pyridinyl phenyl - / - - / - (0d) 1.0/ - 0.7/ - (3d) 2.4/0.7 1.5/0.6 (7d) 3.5/0.8 4.1/1.1 (10d) 5.0/1.8 6.5/1.6 (14d) 8.0/5.5 6.1/4.3 (30d) 15.8/6.7 13.0/7.6 8 (51d) 16.6/3.7 16.4/2.9 (83D) 6.3/1.1 6.0/1.0 (120d) <u>Compound 7 Old Basing</u> pyridinyl phenyl - / - - / - (0d) - / - - / - (3d) - / - - / - (7d) - / - - / - (10d) 0.5/ - - / - (14d) 2.3/ - 0.2/ - (30d) 1.2/ - 0.2/0.4 (51d) 0.5/0.4 0.4/0.3 (83d) 0.2/1.4 0.2/2.9 (120d)

Compound 7 Virginia Water

pyridinyl	phenyl
- / -	- / - (0d)
- / -	- / - (3d)
- / -	- / - (7d)
- / -	- / - (10d)
- / -	- / - (14d)
0.4/0.3	0.4/0.3 (30d)
1.2/1.7	1.3/2.0 (51d)
11.2/12.8	11.2/14.2 (83d)
25.9/12.4	24.2/12.2 (120d)

Compound 8 Old Basing

pyridinyl	phenyl
- / -	- / - (0d)
- / -	- / - (3d)
- / -	- / - (7d)
- / -	- / - (10d)
0.8/ -	- / - (14d)
- /0.2	0.8/ - (30d)
- / -	0.6/ - (51d)
1.0/0.6	1.1/0.8 (83d)
2.7/0.2	0.9/ - (120d)

Compound 8 Virginia Water

pyridinyl	phenyl
- / -	- / - (0d)
- / -	- / - (3d)
- / -	- / - (7d)
- / -	- / - (10d)
- / -	- / - (14d)
1.3/ -	1.0/ - (30d)
1.0/0.1	1.4/0.2 (51d)
3.9/2.3	3.9/2.5 (83D)
8.4/2.7	8.5/2.9 (120d)

Accumulation in water and/or sediment: No accumulation

Degradation in the saturated zone

no specific data generated as it is not expected that significar quantities of ZA1963 will be found in the saturated zone due its rapid degradation and low potential mobility in soil.

Remarks: none

2.3 Fate and behaviour in air

Volatility

Vapour pressure:	$5.5x10^{-9}$ kPa at 20°C.
Henry's law constant:	6×10^{-4} Pa m^3/mole

Photolytic degradation

Direct photolysis in air:	Assumed negligible in all risk assessments
Photochemical oxidative degradation in air DT_{50}:	Atmospheric half-life: 2.5 hours (Atkinson method)
Volatilisation:	from plant surfaces: <10% over 24 hours from soil: <10% over 24 hours

Remarks:	none

3 Ecotoxicology

Terrestrial Vertebrates

Acute toxicity to mammals:	LD_{50} >5000 mg/kg (Rat)
Acute toxicity to birds:	LD_{50} >2250 mg/kg (BobWhite Quail)
Dietary toxicity to birds:	LD_{50} >5200 mg/kg (BobWhite Quail; Mallard Duck)
Reproductive toxicity to birds:	NOEC 1350 mg/kg bw/d (Mallard Duck)
Short term oral toxicity to mammals:	NOEL 4.3 mg/kg bw/d (90-d & 1-yr dietary, dog)

Aquatic Organisms

Acute toxicity fish:

Group	Test substance	Time-scale	Endpoint	Toxicity (µg a.i./l)
Standard and higher tier laboratory tests				
Oncorhynchus mykiss	ZA1963	96 h, static	$L(E)C_{50}$	75
Oncorhynchus mykiss	ZA1963 (YF10267)	96 h, static	$L(E)C_{50}$	55
Pimephales promelas	ZA1963	96 h, static	$L(E)C_{50}$	65
Pimephales promelas	ZA1963	96 h, static in the presence of sediment	$L(E)C_{50}$	66
Cyprinus carpio	ZA1963	96 h, static	$L(E)C_{50}$	160
Gasterosteus aculeatus	ZA1963	96 h, static	$L(E)C_{50}$	100
Lepomis macrochirus	ZA1963	96 h, static	$L(E)C_{50}$	96

Long term toxicity fish:

Oncorhynchus mykiss	ZA1963	28d flow through	NOEC	10

Bioaccumulation fish: Mean in whole fish: 290

Acute toxicity invertebrate:

Group	Test substance	Time-scale	Endpoint	Toxicity (µg a.i./l)
Standard and higher tier laboratory tests				
Daphnia magna	ZA1963	48 h, static	$L(E)C_{50}$	24
Daphnia magna	ZA1963 (YF10267)	48 h, static	$L(E)C_{50}$	20

	Notonecta (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	>1000
	Naucoridae (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	>1000
	Daphnia pulex	ZA1963	48 h, static	$L(E)C_{50}$	>50
	Group	Test substance	Time-scale	Endpoint	Toxicity (µg a.i./l)
	Standard and higher tier laboratory tests				
	Daphnia magna	ZA1963	48 h, static	$L(E)C_{50}$	18
	Dugesia (Turbellaria)	ZA1963	48 h, static	$L(E)C_{50}$	200-1000
	Polycelis (Turbellaria)	ZA1963	48 h, static	$L(E)C_{50}$	200-1000
	Brachionus (Rotifer)	ZA1963	24 h, static	$L(E)C_{50}$	>4000
	Limnea (Gastropoda)	ZA1963	48 h, static	$L(E)C_{50}$	>1000
	Tubificidae (Oligochaeta)	ZA1963	48 h, static	$L(E)C_{50}$	299
	Erpobdella (Hirundinea)	ZA1963	48 h, static	$L(E)C_{50}$	200-1000
	Cloeon (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	194
	Coenagrion (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	>1000
	Agrypnia, larva (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	158
	Chaoborus, larva (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	332
	Chironomus, larva (Insecta)	ZA1963	48 h, static	$L(E)C_{50}$	326
	Diaptomus (copepod)	ZA1963	48 h, static	$L(E)C_{50}$	5
	Macrocyclops (copepod)	ZA1963	48 h, static	$L(E)C_{50}$	87
	Asellus (isopoda)	ZA1963	48 h, static	$L(E)C_{50}$	152
	Crangonyx (amphipoda)	ZA1963	48 h, static	$L(E)C_{50}$	63
Chronic toxicity invertebrate:	*Daphnia magna*	ZA1963	21 day study	NOEC	8
Acute toxicity algae:					
	Selenastrum capricornutum	ZA1963	72 h, static	E_bC_{50} ErC_{50}	56 260
	Selenastrum capricornutum	ZA1963 (YF10267)	72 h, static	E_bC_{50}	41
Chronic toxicity sediment dwelling organism:	*Chironomus riparius*	ZA1963	28 d, static	NOEC	5000 µg/kg

	Chironomus riparius	ZA1963	25 d, static	NOEC	62.5 µg/l
Acute toxicity aquatic plants:	Not required				
Microcosm study	EAC = 12 µg ai/l				

Honeybees

Acute oral toxicity:	Studies on the oral toxicity of ZA1963 technical have not been conducted due to low dispersibility of the active ingredient in feeding solution. The oral toxicity of the **SC** formulation (48 h LD_{50}) is >200 µg ai/bee, 48 h NOEL 200 µg/bee
Acute contact toxicity:	48 h LD_{50} for ZA1963 technical is > 200 µg ai/bee, 48 h NOEL 200µg/bee The contact toxicity of the SC formulation (48 h LD_{50}) is >200 µg ai/bee, 48 h NOEL 200µg/bee

Other arthropod species

Test species	% Effect
Typhlodromus pyri (Protonymphs)	Laboratory tests Tier I (glass plate): Substance YF10267, 250/500 g as/ha, Mortality(7days) 56/49%
Chrysoperla carnea (1st instar)	Laboratory tests Tier I (glass plate): Substance YF10267, 250/500 g as/ha, Mortality 100%/100%
Poecilus cupreus (Adults)	Laboratory tests Tier I (glass plate): Substance YF10267, 250/500 g as/ha, Mortality No effects
Aphidius rhopalosiphi (Adults)	Laboratory tests Tier II (natural substrate): Substance YF10267, 250/500 g as/ha, Mortality 100/100%
Chrysoperla carnea (2nd instar)	Laboratory tests Tier II (natural substrate): Substance YF10267, 250/500 g as/ha, Mortality(48 hrs) >30%
Coccinella septempunctata (2-3 day old larvae)	Laboratory tests Tier II (natural substrate): Substance YF10267, 250/500 g as/ha, Mortality(48 hrs) >30%
Aleochara bilineata (Adults)	Laboratory tests Tier II (natural substrate): Substance YF10267, 250/500 g as/ha, Mortality No effects
Aphidius rhopalosiphi (Adults)	Semi-field: Substance YF10434, 250/500 g as/ha, Mortality Fecundity No significant effects 3 DAT
Aphidius rhopalosiphi (Adults)	Semi-field: Substance YF10267, 250/500 g as/ha, Mortality Fecundity No significant effects

Chrysoperla carnea 2nd instar	Semi-field: Substance YF10267, 250/500 g as/ha Mortality, No significant effects
Coccinella septempunctata (2-3 day old larvae)	Semi-field: Substance YF10267, 250/500 g as/ha, Mortality Fecundity No significant effects
Typhlodromus pyri (Protonymphs)	Off-crop habitats (dose-response testing glass plate): Substance YF10434, 12.5, 25, 250, 500 g as/ha, Mortality Fecundity No effects on mortality or fecundity
Typhlodromus pyri (Protonymphs)	Off-crop habitats (dose-response testing glass plate): Substance YF10267, 2.5, 10, 50, 100, 150, 250, 500, 750 g as/ha, Mortality Fecundity LC_{50} 12.6 g/ha / LC_{30} 3.4 g/ha No effects on fecundity
Aphidius rhopalosiphi (Adults)	Off-crop habitats (dose-response testing glass plate): Substance YF10267, 0.25, 0.45, 0.8, 1.4, 2.5, 12.5 g as/ha, Mortality Fecundity LC_{50} 0.68 g/ha / LC_{30} 0.38 g/ha No effects on fecundity
Aphidius rhopalosiphi (Adults)	Off-crop habitats (dose-response testing plants): Substance YF10267, 12.5, 25, 62.5, 125, 187.5, 250 g as/ha, Mortality Fecundity LC_{50} 283 g/ha / LC_{30} 186 g/ha No effects on fecundity
Rhopalosiphum padi (Adults)	Off-crop habitats (dose-response testing plants): Substance YF1026712.5, 50, 125, 250.5 g as/ha, Mortality 7d LC_{50} 200 g/ha

Earthworms

Acute toxicity:	Uncorrected Values: ZA1963: LC_{50} 6.7 mg/kg dry wgt. YF10267:LC_{50} 6.1 mg/kg dry wgt. Corrected Values as Log Pow = 3.6: ZA1963: LC_{50} 3.4 mg/kg dry wgt. YF10267:LC_{50} 3.1 mg/kg dry wgt.
Reproductive toxicity:	Since ZA1963 is rapidly degraded in soil with a DT_{50} under field conditions ranging from 3 to 35 days (mean = 20 days), no specific studies have been carried out to address sublethal effects.

Soil micro-organisms

Nitrogen mineralization:	Minor, transient effects at 750 g/ha (up to 28 d)
Carbon mineralization:	Minor, transient effects at 750 g/ha (up to 28 d)

APPENDIX III

PICOXYSTROBIN

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 classification and labelling, B.5 Methods of analysis

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

B.6 Toxicology and metabolism

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
IIA, 5.8.1.2/03	Twomey, K	2000	ZA1963 Metabolite 8 (R408509): 90 Day Dietary Toxicity Study in the Rat Zeneca Central Toxciology Laboratory, Macclesfield, UK Report No. CTL/PR1167 GLP, Un-published

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

B.8 Environmental fate and behaviour

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

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
IIIA 9.2.1/03	Greener M.	2001	'Picoxystrobin – Using FOCUS-PELMO to Model the Leaching Potential Following Use on Cereals in Europe', Syngenta (Jealott's Hill International Research Centre, Bracknell, Berkshire, UK). Report no.: RAJ0064B. Unpublished.
IIA 7.2.2/05	Hayes SE, Seymour MP.	1999	'ZA1963 – Calculation of Half-Life by Reaction with Atmospheric Hydroxyl Radicals for R413834 (Compound 26)', Syngenta (Jealott's Hill International Research Centre, Bracknell, Berkshire, UK). Report no.: TMJ4197B. Unpublished.

B.9 Ecotoxicology

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

APPENDIX IV

List of uses supported by available data

PICOXYSTROBIN

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 (min)	kg as/hl min max	water l/ha min max	kg as/ha min max		
Cereals	EU	Acanto (YF 11393)	F	Certain fungal diseases in Wheat & Barley	SC	250	Foliar spray	GS 29 – 71	2	14	0.08 – 0.125	200- 300	0.25	35	XXX

Remarks:

(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 plants - 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) The minimum and maximum number of application possible under practical conditions of use must be provided
(l) PHI - minimum pre-harvest interval
(m) Remarks may include: Extent of use/economic importance/restrictions