azoxystrobin (Ref: ICI 5504)

** azoxystrobine ** ICI-A 5504 ** Icia 5504 **

Translations

Environmental Fate - Ecotoxicology - Human Health - A to Z Index - Home - FOOTPRINT

GENERAL INFORMATION

Description: A post-emergence broad spectrum strobilurin fungicide used mainly for cereals

Introduction: 1992

EC Directive 91/414:

Status	Annex 1
Dossier rapporteur/co-rapporteur	UK/Czech Republic
Date inclusion expires	-

Approved for use (✓) or known to be used (#) in the following European countries:

AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Also registered in: Australia, USA

General status:

Pesticide Type	Fungicide
Chemical Group	Strobilurin
Mode of Action	Systemic translaminar and protectant action having additional curative and eradicant properties. Respiration inhibitor (QoL fungicide).
CAS RN	131860-33-8
EC Number	-
CIPAC Number	571
US EPA Chemical code	128810
Chemical Formula	$C_{22}H_{17}N_3O_5$
SMILES	O=C(OC)\C(=C\OC)c3ccccc3Oc2ncnc(Oc1c(C#N)cccc1)c2
International Chemical Identifier (InChI)	InChI=1/C22H17N3O5 /c1-27-13-17(22(26)28-2)16-8-4-6-10-19(16)30-21-11-20(24-14-25-21)29-18-9-5-3-7-15(18) /h3-11,13-14H,1-2H3/b17-13+
Structure diagram available?	Yes

Molecular Mass (g mol^{-1})	403.4
IUPAC Name	methyl (*E*)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate
CAS Name	methyl (α*E*)-2-[[6-(2-cyanophenoxy)-4-pyrimidinyl]oxy]-α-(methoxymethylene)benzeneacetate
Other status information	-
Herbicide Resistance (HRAC) Classification	Not applicable
Insecticide Resistance (IRAC) Classification	Not applicable
Fungicide Resistance (FRAC) Classification	11
Physical State	White crystalline solid

Formulations:

Property	Value
Example manufacturers of products using this active	• AgriGuard • Clayton • Syngenta
Example products using this active	• Amistar • Amistar Opti • Amistar Pro • Olympus • Priori Xtra • Quadris • Abound • Ortiva
Associated substances	• chlorothalonil • cyproconazole • difenoconazole • fenpropimorph
UK LERAP status	LERAP Category B (potatoes)
Formulation and application details	Often supplied as a suspension concentrated diluted for spray application.

ENVIRONMENTAL FATE

Property	Value	Source/Quality Score/Other Information	Interpretation

Solubility - In water at 20°C (mg l^{-1})		6.7	A5	Low
Solubility - In organic solvents at 20°C (mg l^{-1})		57	A5 - Hexane	-
		20000	A5 - Methanol	-
		55000	A5 - Toluene	-
		86000	A5 - Acetone	-
Melting Point (°C)		116	A5	-
Boiling Point (°C)		360	A5	-
Degradation point (°C)		345	A5	-
Flashpoint (°C)		Not highly flammable	A5	-
Octanol-water partition coefficient at pH 7, 20°C	P:	3.16 X 10^{02}	Calculated	-
	Log P:	2.5	A5	Low
Bulk density (g ml^{-1})/Specific gravity		1.34	A5	-
Dissociation constant (pKa) at 25°C		Not applicable Note: No dissociation	A5	-
Vapour pressure at 25°C (mPa)		1.10 X 10^{-07}	A5	Non-volatile
Henry's law constant at 25°C (Pa m^3 mol^{-1})		7.40 X 10^{-09}	A5	Non-volatile
Henry's law constant at 20°C (dimensionless)		2.72 X 10^{-12}	Q2	Non-volatile
Soil degradation (days) (aerobic)	DT50 (typical):	70	A5	Moderately persistent
	DT50 (lab at 20°C):	84.5	A5	Moderately persistent
	DT50 (field):	180.7	A5	Persistent
	DT90 (lab at 20°C):	363.3	A5	-
	DT90 (field):	600.4	A5	-
	Note:	EU Dossier lab studies DT50 range 35.2-248 days, DT90 range 187-824 days; Field studies DT50 range 120.9-261.9 days (actual), DT90 range 401.7-869.9 days; Other sources: 72-164 days		
Aqueous photolysis DT50 (days) at pH 7	Value:	8.7	A5	Moderately fast
	Note:	-		
Aqueous hydrolysis DT50 (days) at 20°C and pH 7	Value:	Stable	A5	Very persistent
	Note:	Not pH senstive, hydrolytically stable		
Water-Sediment DT50 (days)		205	A5	Slow
Water phase only DT50 (days)		46	A5	Stable

GUS leaching potential index		2.43	Calculated	Transition state
SCI-GROW groundwater index (µg l^{-1}) for a 1 kg ha^{-1} or 1 l ha^{-1} application rate	Value:	1.45 X 10^{-01}	Calculated	-
	Note:	-		
Potential for particle bound transport index		-	Calculated	Medium
Koc - Organic-carbon sorption constant (ml g^{-1})		482	A5	Moderately mobile
		pH sensitivity: None		
		Note: Other sources Kfoc range 207-594 mL/g; Other sources: Koc = 1590 mL/g (DW3)		
Freundlich isotherm	Kf:	3.43	A5	-
	$^1/_n$:	0.85		-
	Note	EU dossier Kf range 0.76-2.9, 1/n range 0.81-0.92		
Maximum UV-vis absorption L mol^{-1} cm^{-1}		[202.6nm = 60700, 242.7nm = 17800, 295nm = 302]	A5	-

Key metabolites:

Metabolite	Formation Medium	Estimated Maximum Occurrence Fraction	91/414 Relevancy
(E)-2-(2-[6-cyanophenoxy)-pyrimidin-4-yloxyl]-phenyl-3-methoxyacrylic acid (Ref: R234886)	Soil	0.288	Major fraction, Relevant
4-(2-cyanophenoxy)-6-hydroxypyrimidine (Ref: R401553)	Soil	0.057	Minor fraction, Relevant
2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]benzoic acid (Ref: R402173)	Soil	0.076	Minor fraction, Relevant

Other known metabolites:

Metabolite name and reference	Aliases	Formation Medium / Rate	Estimated Maximum Occurrence Fraction
glucosyl (E)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxypropionate	Metabolite N1	Plant	-
glucosyl (2E)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate	Metabolite N2	Plant	-

glucosylmalonyl 2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxypropionate	Metabolite O2	Plant	-
glucosylmalonyl (2E)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate	Metabolite O3	Plant	-
2-(2-{[6-(2-cyanophenoxy)pyrimidin-4-yl]oxy}phenyl)-3-methoxypropanoic acid	Metabolite U5	unknown	-
(2-{[6-(2-cyanophenoxy)pyrimidin-4-yl]oxy}phenyl)acetic acid	Metabolite M20	Animal	-
2-hydroxybenzonitrile	Metabolite M13	unknown	-
4-{[6-(2-cyanophenoxy)pyrimidin-4-yl]oxy}-3-[(1E)-1,3-dimethoxy-3-oxoprop-1-en-2-yl]phenyl glucopyranuronic acid	Metabolite K1	unknown	-
2-{[6-(2-cyanophenoxy)pyrimidin-4-yl]oxy}-x-hydroxybenzoic acid	Metabolite L9	Animal	-
methyl (2E)-2-(2-{[6-(2-cyanophenoxy)pyrimidin-4-yl]oxy}-x-hydroxyphenyl)-3-methoxyprop-2-enoate	Metabolite L1	Animal	-
S-(2-cyano-x-hydroxyphenyl)cysteine	Metabolite L4	Animal	-
methyl (Z)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (Ref: R230310)	Metabolite M09; Z-isomer of azoxystrobin	Plant	-
6-(2-cyanophenoxy)-3-glucosylpyrimidin-4-one (Ref: R405287)	Metabolite M42	Plant	-

ECOTOXICOLOGY

Property		Value	Source/Quality Score/Other Information	Interpretation
Bio-concentration factor	BCF:	-	A5 Low risk	-
	CT50 (days):	Not available		-
Bioaccumulation potential		-	Calculated	Low
Mammals - Acute oral LD50 (mg kg^{-1})		> 5000	A5 Rat	Low

Mammals - Short term dietary NOEL	(mg kg^{-1}):	-	A5 Rat	-
	(ppm diet):	500		-
Birds - Acute LD50 (mg kg^{-1})		> 2000	A5 *Colinus virginianus*	Moderate
Birds - Short term dietary (LC50/LD50)		> 1179 mg/kg	A5 *Colinus virginianus*	-
Fish - Acute 96 hour LC50 (mg l^{-1})		0.47	A5 *Oncorhynchus mykiss*	Moderate
Fish - Chronic 21 day NOEC (mg l^{-1})		0.147	A5 *Pimephales promelas*	-
Aquatic invertebrates - Acute 48 hour EC50 (mg l^{-1})		0.23	A5 *Daphnia magna*	Moderate
Aquatic invertebrates - Chronic 21 day NOEC (mg l^{-1})		0.044	A5 *Daphnia magna*	-
Aquatic crustaceans - Acute 96 hour LC50 (mg l^{-1})		0.055	A5 *Americamysis bahia*	High
Sediment dwelling organisms - Acute 96 hour LC50 (mg l^{-1})		-	-	-
Sediment dwelling organisms - Chronic 28 day NOEC, static, water (mg l^{-1})		0.8	A5 *Chironomus riparius*	Moderate
Sediment dwelling organisms - Chronic 28 day NOEC, sediment (mg kg^{-1})		-	-	-
Aquatic plants - Acute 7 day EC50, biomass (mg l^{-1})		0.64	A5 *Lemna gibba*, fronds	Moderate
Algae - Acute 72 hour EC50, growth (mg l^{-1})		0.36	A5 *Selenastrum capricornutum*	Moderate
Algae - Chronic 96 hour NOEC, growth (mg l^{-1})		0.8	Q2 Unknown species	Moderate
Honeybees - Acute 48 hour LD50 (µg bee^{-1})		> 25	A5 Oral	Moderate
Earthworms - Acute 14 day LC50 (mg kg^{-1})		283	A5 Eisenia foetida	Moderate
Earthworms - Chronic 14 day NOEC, reproduction (mg kg^{-1})		20	A5 Eisenia foetida	Moderate
Other soil macro-organisms - e.g. Collembola	LR50 / EC50 / NOEC / % Effect	=	-	-
Other arthropod (1)	LR50 g ha^{-1}:	1000	Mortality A5 *Aphidius rhopalosiphi*	Harmless at 1 kg ha^{-1}
	% Effect:	23.0	Sublethal effect Dose: 0.25 kg ha^{-1} A5 *Aphidius rhopalosiphi*	Harmless

Other arthropod (2)	LR50 g ha^{-1}:	1500	Mortality A5 *Typhlodromus pyri*	Harmless at 1 kg ha^{-1}
	% Effect:	3.9	Mortality Dose: 0.188 kg ha^{-1} A5 *Typhlodromus pyri*	Harmless
Soil micro-organisms		Nitrogen mineralisation: No significant effect Carbon mineralisation: No significant effect	A5 [Dose: 2.5 kg ha^{-1}]	-
Mesocosm study data	NOEAEC mg l^{-1}:	10	A5 Daphna, Cladocera, Copepoda	-
	NOEAEC mg l^{-1}:	-	-	-

HUMAN HEALTH AND PROTECTION

General:

Property		Value	Source/Quality Score/Other Information	Interpretation
Mammals - Acute oral LD50 (mg kg^{-1})		> 5000	A5 Rat	Low
Mammals - Dermal LD50 (mg kg^{-1} body weight)		> 2000	A5 Rat	-
Mammals - Inhalation LC50 (mg l^{-1})		0.69	A5 Rat (particle size <2/0 um)	-
ADI - Acceptable Daily Intake (mg kg^{-1}bw day^{-1})		0.2	A5 Rat, SF=100	-
ARfD - Acute Reference Dose (mg kg^{-1}bw day^{-1})		Not allocated	A5	-
AOEL - Acceptable Operator Exposure Level - Systemic (mg kg^{-1}bw day^{-1})		0.2	A5 Rat, SF=100	-
Dermal penetration studies (%)		0.3-0.5	A5	-
Dangerous Substances Directive 76/464		-	-	-
Exposure Limits		[No unacceptable risks identified]	-	-
Exposure Routes	Public:	-		
	Occupational:	[No unacceptable risks identified]		
Examples of European MRLs (mg kg^{-1})	Value:	Celery: 5.0; Lettuce, blackberries and raspberries: 3.0; Grapes and strawberries: 2.0; Cucumbers, summer squash, beans (with pods) and citrus: 1.0; Broccoli, cauliflowers, melons (not watermelons), pumpkins, winter squash and peas (with pods): 0.5; Brussel sprouts, cabbages, barley grains, oat grains, rye grains and wheat grains: 0.3; Beans (edible parts) and peas (edible parts): 0.2; Other vegetables, other fruit		

	and other cereal grains: 0.05		
Note:	[Current May 2007.] For the EU pesticides database click here		
Drinking Water MAC (µg l^{-1})	-	-	-

Health issues:

Carcinogen	Endocrine disrupter	Reproduction / development effects	Acetyl cholinesterase inhibitor	Neurotoxicant	Respiratory tract irritant	Skin irritant	Eye irritant
X	-	?	X	X	-	✓	✓

General human health issues: [Minor effects on reproduction / development observed], [Liver toxicant]

✓ : Yes, known to cause a problem
X : No, known not to cause a problem
? : Possibly, status not identified
- : No data

Handling issues:

Property	Value	Source/Quality Score/Other Information	Interpretation
General	[Not explosive or oxidising], [IMDG Transport Code is usually 9]		
EC Risk Classification	[T - Toxic: R23], [N - Dangerous for the environment: R50, R53]		
EC Safety Classification	S1/2, S22, S45, S60, S61		
WHO Classification	U	-	Unlikely to present acute hazard in normal use
US EPA Classification (formulation)	No consensus across products or no products available	-	-
UN Number	Variable with product, usually 2811, 3077 or 3082		
Waste disposal & packaging	[Usually Packaging Group III (minor danger)]		

TRANSLATIONS

Language	Name
English	azoxystrobin
French	azoxystrobine
German	Azoxystrobin
Danish	azoxystrobin
Italian	azoxystrobin
Spanish	azoxiestrobina
Greek	azoxystrobin

Slovenian	azoksistrobin
Polish	azoksystrobina
Swedish	azoxystrobin
Hungarian	azoxistrobin
Dutch	azoxystrobin

Site last updated: Monday 29 November 2010
Contact: aeru@herts.ac.uk

Acknowledgements: The PPDB website has been compiled from the EMA/EMA On-line pesticide properties database, with additional input from the EU-funded FOOTPRINT project and others. Special thanks are due to Don Wauchope, Nick Jarvis (SLU Sweden), Stefan Reichenberger (University of Giessen, Germany) and Benoit Rйal (ARVALIS-Institut du Vйgйtal, France) for their assistance in sourcing additional data. The funding of FOOTPRINT by the European Commission as part of its Framework Programme for Research and Development is also gratefully acknowledged.