S-Metolachlor

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

DOCUMENT M-CA, Section 9

Ecotoxicological Studies

LITERATURE DATA

Version history[1]

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

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CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for S-metolachlor, relevant metabolite(s) and EU representative formulation A9396G (Dual Gold®).

CA 9.2 Author(s) of the review

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

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

The search strategy is detailed in the tables below. In summary, initially a very broad search was done to look for any references which included the active substance S-metolachlor, or its major metabolites, or its representative formulation, in conjunction with any of the key words set out in Table 9.5-1.

The names searched for were:

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L1      QUE  (693288-41-4 OR 131068-72-9 OR 1217465-10-5 OR 244270-80-2)
L2      QUE  (244270-82-4 OR 887649-86-7 OR 244270-79-9 OR 244270-81-3)
L3      QUE  (887649-85-6 OR 947601-85-6 OR 446027-17-4 OR 1173021-76-5)
L4      QUE  (1418095-19-8 OR 126605-22-9 OR 153516-68-8 OR 61520-53-4)
L5      QUE  (82508-08-5 OR 82508-09-6 OR 61520-54-5 OR 97055-05-5)
L6      QUE  (32428-71-0 OR 97055-06-6 OR 52559-52-1 OR 51219-00-2)
L7      QUE  (96394-97-7 OR 121073-75-4 OR 170379-74-5 OR 152019-73-3)
L8      QUE  (120375-14-6 OR 65513-61-3 OR 159956-64-6 OR 171118-09-5)
L9      QUE  (CGA098847 OR CGA98847 OR CGA46129 OR CGA138868)
L10     QUE  (CGA354743 OR CGA41507 OR CGA51202 OR CGA40172)
L11     QUE  (CGA40919 OR CGA37735 OR CGA49751 OR CGA37913)
L12     QUE  (CGA351915 OR CGA133275 OR CGA046129 OR CGA13656)
L13     QUE  (CGA(2W)(098847 OR 98847 OR 46129 OR 138868))
L14     QUE  (CGA(2W)(354743 OR 41507 OR 51202 OR 40172))
L15     QUE  (CGA(2W)(40919 OR 37735 OR 49751 OR 37913))
L16     QUE  (CGA(2W)(351915 OR 133275 OR 046129 OR 13656))
L17     QUE  (SYN542491 OR SYN542489 OR SYN542492 OR SYN547969)
L18     QUE  (SYN542488 OR SYN542490 OR SYN542607 OR NOA436611)
L19     QUE  (SYN(2W)(542491 OR 542489 OR 542492 OR 547969))
L20     QUE  ((SYN(2W)(542488 OR 542490 OR 542607)) OR (NOA(2W)436611))
L21     QUE  (55762-76-0 OR 63150-68-5 OR 94449-58-8 OR (CGA(W)77102))
L22     QUE  (METETILACHLOR OR METOLACHLOR OR (CGA(W)24705) OR CGA24705)
L23     QUE  ((S OR ALPHA)(2W)(METOLACHLOR OR METHOLACHLOR))
L24     QUE  (CGA77102 OR 51218-45-2 OR 87392-12-9 OR METHOLACHLOR)
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L25     QUE  (L1-L20)   METABOLITES
L26     QUE  (L21 OR L22 OR L23 OR L24)   METOLACHLOR
L27     QUE  (L25 OR L26)   METOLACHLOR & METABOLITES
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An overview of the results is summarised in the table below and further details are provided in Section 9.5.

Data requirement(s) captured in the search	Number
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	1295
Number of *summary records* excluded from the search results after rapid assessment for relevance	1136
Total number of *full-text* documents assessed in detail*	159
Number of *studies* excluded from further consideration after detailed assessment for relevance	103
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	56

*both from bibliographic databases and other sources of peer-reviewed literature

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

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

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

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

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

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	10. Study conditions should not differ significantly from recommended protocols. 11. Study conditions should not interfere with the interpretation of the study results. <u>Field Studies</u> 12. Appropriate and relevant geoclimatic conditions (setting), appropriate application method and rates (exposure) and observation data (biological relevance) to derive endpoints. 13. Well defined test material (including purity/content) 14. Applicable test species 15. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 16. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods and appropriate sampling regime). 17. Study conditions should not differ significantly from recommended protocols, if available for field study. Study conditions should not interfere with the interpretation of the study results
CA 5.8.3 Endocrine disrupting properties	18. Identified test material 19. All studies considered relevant at this stage – need to be checked for reliability 20. Relevant to ED assessment (LI60, LI 61)

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

The initial rapid assessment followed the advice given in the EFSA Guidance Document: **Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009; EFSA Journal 2011; 9(2):2092.** Under 'Selecting the relevant studies and reporting the selection process (page 23) the Guidance states:

"If the first iteration results in a large number of studies that are of unclear relevance, refinement of the selection criteria may be considered.

1. *Rapid assessment for relevance based on summary records (e.g. titles and abstracts), to exclude summary records which are obviously irrelevant. Summary records which appear to be relevant and those of unclear relevance go to the next step. If there is insufficient information in the summary record to determine relevance, then assessment of full-text documents (step 2 below) will be required. During this assessment, a summary record may be excluded on the basis of the title alone (e.g. if an abstract is not available), provided that the title provides sufficient information to clearly indicate non-relevance."*

Guidance on setting the relevance criteria are set out in section 5.1. In essence, the relevance criteria are driven by the data requirements for each section, in this case ecotoxicological studies as set out in M-CA Section 8. The Guidance document then gives much more specific criteria to assess relevance (see pages 15 and 16; e.g. well identified test material; sufficient number of doses tested, etc.) which however in practice cannot be identified until a thorough in-depth review of each publication is carried out.

The data requirement criteria were used to define the key words and the search strategies that are presented in Document M-CA Section 9 Supplement Ecotoxicology, in Table 9.5-1.

The rapid assessment for relevance was then carried out by looking at all the published article titles and short abstracts (where available) to identify records which *'are obviously irrelevant'*, as stated in the

Guidance. This followed the general advice given in Appendix C for rapid assessment based on summary records -

"Due to the lack of relevance information in the summary records, the following revised criteria were

Used to classify a summary record as potentially relevant to the [eco-]toxicological risk assessment:

· ***Test material identified in the summary record (regardless the purity/impurity profile).***

· ***Test species relevant to the [ecotoxicological] assessment.***

· *Sufficient number of doses tested (except for OECD code 5.1 and 5.4).*

· ***Relevant route(s) of administration.***

· *Epidemiological studies, medical reports and actual exposure measurements were always considered relevant at this stage.*

· ***Studies which may be helpful for the interpretation of other studies present in the dossier, but do not fit under a specific toxicological endpoint (broadly included in the OECD code referred as "other toxicological studies").***"

In practice only the criteria identified in bold above were used for the ecotoxicological rapid assessment evaluation. In this specific case, the summary records that were identified as obviously not relevant, were not relevant for the ecotoxicological assessment, although they may have been relevant for another data requirement (e.g. environmental fate or (largely) efficacy).

CA 9.5 Search methods

Date of initial search	20 August 2014
Date of most recent update to search	-
Date span of the search	10 years

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

Search Strategy	
L1	QUE (693288-41-4 OR 131068-72-9 OR 1217465-10-5 OR 244270-80-2)
L2	QUE (244270-82-4 OR 887649-86-7 OR 244270-79-9 OR 244270-81-3)
L3	QUE (887649-85-6 OR 947601-85-6 OR 446027-17-4 OR 1173021-76-5)
L4	QUE (1418095-19-8 OR 126605-22-9 OR 153516-68-8 OR 61520-53-4)
L5	QUE (82508-08-5 OR 82508-09-6 OR 61520-54-5 OR 97055-05-5)
L6	QUE (32428-71-0 OR 97055-06-6 OR 52559-52-1 OR 51219-00-2)
L7	QUE (96394-97-7 OR 121073-75-4 OR 170379-74-5 OR 152019-73-3)
L8	QUE (120375-14-6 OR 65513-61-3 OR 159956-64-6 OR 171118-09-5)
L9	QUE (CGA098847 OR CGA98847 OR CGA46129 OR CGA138868)
L10	QUE (CGA354743 OR CGA41507 OR CGA51202 OR CGA40172)
L11	QUE (CGA40919 OR CGA37735 OR CGA49751 OR CGA37913)
L12	QUE (CGA351915 OR CGA133275 OR CGA046129 OR CGA13656)
L13	QUE (CGA(2W)(098847 OR 98847 OR 46129 OR 138868))
L14	QUE (CGA(2W)(354743 OR 41507 OR 51202 OR 40172))
L15	QUE (CGA(2W)(40919 OR 37735 OR 49751 OR 37913))
L16	QUE (CGA(2W)(351915 OR 133275 OR 046129 OR 13656))
L17	QUE (SYN542491 OR SYN542489 OR SYN542492 OR SYN547969)
L18	QUE (SYN542488 OR SYN542490 OR SYN542607 OR NOA436611)
L19	QUE (SYN(2W)(542491 OR 542489 OR 542492 OR 547969))

Search Strategy

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L20     QUE  ((SYN(2W)(542488 OR 542490 OR 542607)) OR (NOA(2W)436611))
L21     QUE  (55762-76-0 OR 63150-68-5 OR 94449-58-8 OR (CGA(W)77102))
L22     QUE  (METETILACHLOR OR METOLACHLOR OR (CGA(W)24705) OR CGA24705)
L23     QUE  ((S OR ALPHA)(2W)(METOLACHLOR OR METHOLACHLOR))
L24     QUE  (CGA77102 OR 51218-45-2 OR 87392-12-9 OR METHOLACHLOR)
L25     QUE  (L1-L20)  METABOLITES
L26     QUE  (L21 OR L22 OR L23 OR L24)  METOLACHLOR
L27     QUE  (L25 OR L26)  METOLACHLOR & METABOLITES

                                    Plus
L1    QUE  (RIPARIAN? OR REPTILE? OR SNAKE? OR LIZARD?)
L2    QUE  (TORTOISE? OR TURTLE? OR TERRAPIN? OR CROCODIL?)
L3    QUE  (ALLIGATOR? OR CAIMAN? OR GHARIAL? OR HOVERFLIES)
L4    QUE  ((MEADOW#(W)VOLE#) OR PSEUDOKIRSCHNERIELLA)
L5    QUE  (RHAPHIDOCELIS OR NITZSCHIA OR CYCLOTELLA OR MICROCYSTIS)
L6    QUE  (OSCILLATORIA OR APHANIZOMENON OR ANKISTRODESMUS)
L7     QUE  (TEILINGRIA OR MONORAPHIDIUM OR RADIOCOCCACAE OR TETRASPORALES)
L8     QUE  (TETRAEDRON OR TREUBARIA OR WILLEA OR COSMOCLADIUM)
L9     QUE  (HYPOASPIS OR (SOIL(3A)MICROORGAN?) OR ECHINOCHLOA OR SPARTINA)
L10    QUE  (SALVINIA OR NAJAS OR CALLITRICHE OR MYOSOTIS OR STRATIOTES)
L11    QUE  (HIPPURUS OR PERSICARIA OR CLOEON? OR CORBICULA?)
L12    QUE  (NEOCARIDINIA? OR NEOCARIDINA? OR MYSID? OR CICHLIDAE)
L13    QUE  (CICHLID# OR LEPOMIS? OR SERRANIDAE OR PERCIFORMES)
L14    QUE  (ICTALURUS? OR POECILIA? OR ORYZIAS? OR GASTEROSTEUS?)
L15    QUE  (GASTEROSTEIDAE OR SALVELINUS OR BRACHYDANIO? OR CARASSIUS?)
L16    QUE  (MISGUMUS? OR CYPRINODON? OR FUNDULUS? OR MISGURNUS?)
L17    QUE  (BREAM OR ROTIFER# OR GAMMARUS OR GAMMARID? OR MAYFLY?)
L18    QUE  (BIVALVE# OR MUSSEL# OR MOLLUSK# OR MOLLUSC# OR BUFO)
L19    QUE  (NEWT# OR SCALLOP# OR CLAM# OR GAMBUSIA OR OREOCHROMIS)
L20    QUE  (OSTRAC? OR TUBIFEX? OR TURBELLARIA OR COPEPODA)
L21    QUE  (PREDACE? OR PREDACI? OR PARASITOID? OR APIS OR APIDAE)
L22    QUE  (BOMBUS OR BOMBINAE OR WORM# OR LUMBRICIDAE OR LUMBRICUS)
L23    QUE  (ALLOBOPHORA? OR DENDROBAENA? OR APORRECTODEA? OR DENDRODRILUS?)
L24    QUE  (EISENIA? OR OCTOLASION? OR (LACE(W)WING#) OR NEUROPTER?)
L25    QUE  (CARABID? OR CARBUS OR STAPHYLINID? OR COCCINEL? OR ADALIA?)
L26    QUE  (STETHORUS? OR SCYMNUS? OR WASP# OR VESPIDAE OR SPHECOIDEA)
L27    QUE  (SPHECIDAE OR STIZIDAE OR OPIUS OR (ICHNEUMON(W)FL?))
L28    QUE  (ICHNEUMONID? OR BRACONID? OR CHALCID? OR CYNIP? OR APHIDI?)
L29    QUE  (EUCOILID? OR IBALIID? OR FIGITID? OR EURYTOM? OR TORYM?)
L30    QUE  (ORYM? OR EUCHARIT? OR PERILAMP? OR PTEROMAL? OR CHRYSOLAMP?)
L31    QUE  (EUPELM? OR ENCYRT? OR SIGNIPHOR? OR APHELIN? OR ELASMID?)
L32    QUE  (ELASMUS OR TETRACAMP? OR MYMAR? OR HELOR? OR PROCTOTRUP?)
L33    QUE  (DIAPRI? OR SCELION? OR PLATYGASTR? OR PLATYGASTER?)
L34    QUE  (CERAPHRON? OR MEGASPIL? OR ARANE? OR OPILION? OR PHALANG?)
L35    QUE  (ARACHNID? OR HARVESTM? OR DADDYLONGLEG? OR (DADDY(W)LONG
            (W)LEG?))
L36    QUE  ((DADDY(W)LONGLEG?) OR COLLEMB? OR (SPRING(W)TAIL?) OR
             CYDNODROMUS?)
L37    QUE  (PARDOSA? OR ORIUS? OR TYPHLODROM? OR PHYTOSEIULUS? OR SYRPHID?)
L38    QUE  (METASYRPHUS? OR SYRPHUS? OR EUPEODES? OR EPISYRPHUS? OR
             SYRPHIAN?)
L39    QUE  (EPISTROPHE? OR AMBLYSEIUS? OR POECILUS? OR TRECHUS? OR
             BEMBIDION?)
L40    QUE  (NEBRIA? OR PTEROSTICHUS? OR CALOSOMA? OR TACHYPORUS? OR
             NABIDAE?)
L41    QUE  (GEOCORIS? OR HYMENOPT? OR HAEMATOLOECHA? OR CHRYSOPID? OR
             SYMPHYTA?)
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Search Strategy		
L42	QUE	(OULEMA? OR APHYTIS? OR BATHYPLECTES? OR LINPHIIDAE? OR LYNPHIIDAE?)
L43	QUE	(LINYPHIIDAE? OR ERIGONE? OR BATHYPHANTES? OR MEIONETA? OR OEDOTHORAX?)
L44	QUE	(LEPTHYPHANTES? OR LYCOSID? OR LYCOSA? OR CHRYSOPA? OR DACNUSA?)
L45	QUE	(CYRTORHINUS? OR CRYPTOLAEMUS? OR ZETZELLIA? OR LEPTOMASTIX?)
L46	QUE	(TRICHOGRAMMA? OR ENCARSIA? OR MACROLOPHUS? OR CHRYSOPERLA?)
L47	QUE	(ALEOCHARA? OR CHRYSOPID# OR CHRYSOPIDAE OR DIABROTICA)
L48	QUE	(PALEXORISTA? OR MAMMAL## OR ANIMAL? OR RABBIT? OR RODENT#)
L49	QUE	(BLACKBIRD# OR (BLACK(W)BIRD#) OR ((TURDUS OR T)(W)MERULA))
L50	QUE	(CHAFFINCH? OR ((FRINGILLA OR F)(W)COELEBS) OR GREENFINCH?)
L51	QUE	(((CARDUELIS OR C)(W)CHLORIS) OR SONGTHRUSH?)
L52	QUE	((SONG(W)THRUSH?) OR ((TURDUS OR T)(W)PHILOMELOS) OR WREN#)
L53	QUE	(((TROGLODYTES OR T)(W)TROGLODYTES) OR (WILLOW(W)WARBLER#))
L54	QUE	(((PHYLLOSCOPUS OR P)(W)TROCHILUS) OR (GREAT(W)TIT#))
L55	QUE	(((PARUS OR P)(W)MAJOR) OR ROBIN# OR GOLDFINCH?)
L56	QUE	(((ERITHACUS OR E)(W)RUBECULA) OR DUNNOCK#)
L57	QUE	(((CARDUELIS OR C)(W)CARDUELIS) OR LINNET#)
L58	QUE	(((PRUNELLA OR P)(W)MODULARIS) OR SKYLARK# OR (SKY(W)LARK#))
L59	QUE	((HEDGE(W)(SPARROW# OR ACCENTOR#)))
L60	QUE	(((CARDUELIS OR C)(W)CANNABINA) OR ((ALAUDA OR A)(W)ARVENSIS))
L61	QUE	((RED(W)LEGGED(W)PARTRIDGE#) OR ((ALECTORIS OR A)(W)RUFA))
L62	QUE	((MEADOW(W)PIPIT#) OR MEADOWPIPIT# OR ((ANTHUS OR A)(W) PRATENSIS))
L63	QUE	(LAPWING# OR ((VANELLUS OR V)(W)VANELLUS) OR PEEWIT#)
L64	QUE	(STARLING# OR ((STURNUS OR S)(W)VULGARIS))
L65	QUE	((TURTLE(W)DOVE#) OR ((STREPTOPELIA OR S)(W)TURTUR))
L66	QUE	(YELLOWHAMMER# OR (YELLOW(W)HAMMER#) OR (YELLOW(W)WAGTAIL#))
L67	QUE	(((EMBERIZA OR E)(W)CITRINELLA) OR (YELLOW(W)WAG(W)TAIL#))
L68	QUE	(((MOTACILLA OR M)(W)FLAVA) OR (FAN(W)TAILED(W)WARBLER#))
L69	QUE	((GREY(W)LAG(W)G!!SE) OR ((ANSER OR A)(W)ANSER))
L70	QUE	(REEDBUNTING# OR (REED(W)BUNTING#) OR ((EMBERIZA OR E)(W) SCHOENICLUS))
L71	QUE	(CHAFFINCH? OR BLUETIT? OR (BLUE(W)TIT?))
L72	QUE	(((PARUS OR P)(W)CAERULEUS) OR (SYLVIA(W)COMMUNIS))
L73	QUE	(((GALERIDA OR G)(W)CRISTATA) OR (TREE(W)SPARROW#))
L74	QUE	(((COTURNIX OR C)(W)COTURNIX) OR (GREY(W)PARTRIDGE#))
L75	QUE	(((PERDIX OR P)(W)PERDIX) OR ((PHASIANUS OR P)(W)COLCHICUS))
L76	QUE	(((MILIARIA OR M)(W)CALANDRA?) OR GREYLAGG!!SE)
L77	QUE	((GREYLAG(W)G!!SE) OR ((COLUMBA OR C)(W)PALUMBUS?))
L78	QUE	(((STREPTOPELIA OR S)(W)(ORIENTALIS? OR RISORIA?)))
L79	QUE	(((MOTACILLA OR M)(W)ALBA?) OR (CRESTED(W)LARK#))
L80	QUE	((WHITE(W)WAGTAIL#) OR (WOOD(W)PIGEON#) OR (BIRD(W)LIFE))
L81	QUE	((SONG(W)BIRD#) OR VANELLUS? OR (PEE(W)WIT#))
L82	QUE	(AVIFAUNA? OR (AVI(W)FAUNA?) OR SONGBIRD?)
L83	QUE	(ORNITHOLOG? OR PASSERINE? OR WOODPIGEON#)
L84	QUE	(((PASSER OR P)(W)MONTANUS) OR QUAIL# OR (CALANDRA(W)LARK#))
L85	QUE	(CISTICOLA? OR (Z(W)CISTICOLA?) OR BIRDLIFE)
L86	QUE	(GEESE OR GOOSE OR SPARROWS OR PIGEONS OR LARK#)
L87	QUE	(WARBLER# OR PARTRIDGE# OR BUNTING# OR WAGTAIL#)
L88	QUE	(WHITETHROAT# OR PIED# OR (WHITE(W)THROAT#))
L89	QUE	((FORAGING OR FARMLAND OR GRASSLAND)(3A)BIRD#)
L90	QUE	(BLUEBIRD# OR (ROCK(W)PTARMIGAN#) OR (BLACK(W)REDSTART#))
L91	QUE	((PREDATOR? OR NONTARGET? OR (NON(W)TARGET))(3A)BIRD#)
L92	QUE	((CORN(W)BUNTING#) OR SERINS OR SERINUS)
L93	QUE	(L49 OR L50 OR L51 OR L52 OR L53 OR L54 OR L55 OR L56 OR L57 OR

Search Strategy
L58 OR L59 OR L60 OR L61 OR L62 OR L63 OR L64 OR L65 OR L66 OR L67 OR L68 OR L69 OR L70 OR L71 OR L72 OR L73 OR L74 OR L75 OR L76 OR L77 OR L78 OR L79 OR L80 OR L81 OR L82 OR L83 OR L84 OR L85 OR L86 OR L87 OR L88 OR L89 OR L90 OR L91 OR L92)
L94 QUE L93 NOT (JAPANESE? OR JAPONICA?)
L95 QUE (((SMALL OR WILD)(3A)MAMMAL#) OR (WILD(3A)ANIMAL?))
L96 QUE (VOLE# OR GLIS OR DORMOUSE OR DORMICE OR ELIOMY#)
L97 QUE (LEROT# OR LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS?)
L98 QUE (HARE# OR SORICIDAE? OR SOREX? OR NEOMY# OR CROCIDURA?)
L99 QUE (SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS? OR MICROTUS?)
L100 QUE (CLETHRIONOMYS? OR CRICETIDAE? OR MICROTIN?)
L101 QUE (RAPTOR# OR MARMOSET# OR GOPHER# OR GRASSCUTTER#)
L102 QUE ((PREDATOR? OR NONTARGET? OR (NON(W)TARGET?))(3A)MAMMAL#)
L103 QUE ((WOOD(W)(MOUSE OR MICE)) OR ARVICOLA?)
L104 QUE (MEADOW#(W)VOLE#)
L105 QUE (L95 OR L96 OR L97 OR L98 OR L99 OR L100 OR L101 OR L102 OR L103 OR L104)
L106 QUE (ECOTOX? OR LC50 OR ((LC OR EC OR LR)(W)50) OR EC50 OR LR50)
L107 QUE (ECO OR ECOL OR ECOLOG? OR ENV OR ENVIRONM? OR AQUATIC?)
L108 QUE (L107(5A)(TOX? OR RISK? OR IMPACT? OR EFFECT?))
L109 QUE (AQUATIC? OR FRESHWATER? OR (FRESH(W)WATER?))
L110 QUE (FLORA OR FAUNA OR BIOTA OR ORGANISM? OR INSECT?)
L111 QUE (ENVIRONM? OR LIFE OR INVERTEB? OR CRUSTACE? OR SPECIES)
L112 QUE (ENTOMOFAUNA OR (ENTOMO(W)FAUNA))
L113 QUE (L109(5A)(L110 OR L111 OR L112))
L114 QUE (MAGNA? OR (D(W)MAGNA?) OR CHIRONOM? OR BRACHIONUS?)
L115 QUE (LIMNEA? OR CRASSOSTREA? OR ALGA# OR FISH OR FISHES)
L116 QUE (ONCORHYNCHUS? OR SALMONIDAE? OR CYPRINUS? OR CYPRINID?)
L117 QUE (PIMEPHALES? OR PISCES OR TROUT OR SUNFISH? OR CARP)
L118 QUE (MINNOW? OR (F(W)MINNOW?) OR CATFISH? OR ZEBRAFISH?)
L119 QUE (GOLDFISH? OR (ZEBRA(W)DANIO#) OR GUPPY OR GUPPIES)
L120 QUE (KILLFISH? OR FATHEAD? OR BLUEGILL? OR SALMON#)
L121 QUE (THUNDERFISH? OR (WATER(W)(FLY OR FLEA?)) OR WATERFLEA?)
L122 QUE (FROG# OR AMPHIBIA? OR SHRIMP# OR PRAWN# OR CRAB# OR TOAD#)
L123 QUE (TADPOLE# OR CRAYFISH? OR SHELLFISH? OR LOBSTER#)
L124 QUE (OYSTER# OR SNAIL# OR RANA OR RANIDAE? OR PLANKTON?)
L125 QUE L106 OR L108
L126 QUE ((NONTARGET? OR (NON(W)TARGET?))(5A)(PLANT? OR FLORA?))
L127 QUE ((AQUATIC(3A)(PLANT? OR (PHYTO(W)TOX?) OR PHYTOTOX?)))
L128 QUE (SEDIMENT? OR HYDROSOIL? OR DUCKWEED? OR PONDWEED?)
L129 QUE (((DUCK OR POND)(W)WEED#) OR MACROPHYT? OR PERIPHYTON?)
L130 QUE (POTAMOGETON? OR CHAROPHYTA? OR ELODEA? OR HYDROCHARITA?)
L131 QUE (CERATOPHYL? OR CHLAMYDOMON? OR SELENASTRUM? OR CHLORELLA?)
L132 QUE (SCENEDESMUS? OR SKELETONEMA? OR NAVICULA? OR ANABAENA?)
L133 QUE (MYRIOPHYLLUM? OR GLYCERIA?)
L134 QUE (NONTARGET? OR (NON(W)TARGET?) OR BENEFICIAL?)
L135 QUE (EFFECT? OR INVERTEB? OR ORGANISM? OR ARTHROPOD? OR INSECT?)
L136 QUE (FAUNA OR SPECIES OR (ENTOMO(W)FAUNA?) OR ENTOMOFAUNA?)
L137 QUE ((L134(5A)(L135 OR L136)))
L138 QUE (PREDAT? OR (NATURAL(W)ENEM?) OR BEE OR BEES OR HONEYBEE#)
L139 QUE (BUMBLEBEE# OR ((HONEY OR BUMBLE)(W)BEE#) OR EARTHWORM?)
L140 QUE ((EARTH(W)WORM?) OR LADYBUG# OR LADYBEETLE# OR LADYBIRD#)
L141 QUE ((LADY(W)(BUG# OR BEETLE# OR BIRD#)) OR HOVERFLY)
L142 QUE (HOOVERFLIES OR SAWFLY OR SAWFLIES OR DRONEFLY)
L143 QUE (DRONEFLIES OR FLOWERFLY OR FLOWERFLIES OR LACEWING?)
L144 QUE (((HOVER OR DRONE OR FLOWER OR SAW)(W)(FLY OR FLIES)))
L145 QUE (SPIDER# OR SPRINGTAIL? OR (ROOT(W)WORM#) OR ROOTWORM#)

Search Strategy

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L146   QUE  (L137 OR L138 OR L139 OR L140 OR L141 OR L142 OR L143 OR L144 OR
L145)
L147   QUE  (BIRD? OR AVES OR AVIAN? OR (AVI(W)FAUNA?) OR AVIFAUNA?)
L148   QUE  (SONGBIRD? OR (SONG(W)BIRD?) OR ORNITHOLOG?)
L149   QUE  (L147 OR L148)
L150   QUE  ((WILD(3A)(LIFE OR ANIMAL#)) OR WILDLIFE OR SQUIRREL?)
L151   QUE  (VOLE# OR SCIURUS OR GLIRID? OR GLIS OR DORMOUSE)
L152   QUE  (DORMICE OR ELIOMYS OR LEROT# OR MUSTELID? OR MINK#)
L153   QUE  (MUSTELINE# OR WEASEL? OR STOAT? OR MUSTEL? OR BADGER?)
L154   QUE  (MELES OR MELINAE OR OTTER# OR LUTRA OR LUTRINAE)
L155   QUE  (LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS OR HARE#)
L156   QUE  (TALPA OR MOLE OR MOLES OR HEDGEHOG? OR (HEDGE(W)HOG?))
L157   QUE  (CROCIDURA? OR SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS)
L158   QUE  (MICROTUS OR ARVICOLA OR CLETHRIONOMYS? OR CRICETIDAE?)
L159   QUE  (ERINACEUS OR ERINACEIDAE? OR SORICIDAE? OR SOREX)
L160   QUE  (ENDOCRIN? OR HORMON?)
L161   QUE  (DISRUPT? OR MIMIC? OR MODULAT? OR DISORDER? OR DISEASE?)
L162   QUE  (L160(5A)L161)
L163   QUE  (DAPHNI? OR CERIODAPHNI? OR HYALELLA? OR ASSELLUS)
L164   QUE  L113 OR (L114 OR L115 OR L116 OR L117 OR L118 OR L119 OR L120 OR
L121 OR L122 OR L123 OR L124) OR L163
L165   QUE  (PHYTOPLANKTON? OR AUFWUCH# OR LEMNA? OR ARALES OR CHARA)
L166   QUE  (L126 OR L127 OR L128 OR L129) OR (L130 OR L131 OR L132 OR L133)
OR L165
L167   QUE  (NEOMYS OR MICROTINAE?)
L168   QUE  (L150 OR L151 OR L152 OR L153 OR L154 OR L155 OR L156 OR L157 OR
L158 OR L159) OR L167
L169   QUE  (LOACH? OR STICKLEBACK? OR MUMMICHOG# OR TILAPIA? OR ASELLUS)
L170   QUE  L164 OR L169
L171   QUE  L125 OR L170 OR L166 OR L146 OR L149 OR L168 OR L162
L172   QUE  (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR
L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR
L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR
L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41 OR L42 OR L43 OR
L44 OR L45 OR L46 OR L47 OR L48)
L173   QUE  (L171 OR L172 OR L94 OR L105)
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Table 9.5-2: Details of Databases Searched and justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	168
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		67
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily.		0
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		32
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		25

Provider	Database	Justification	Limits applied	Number*
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		110
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		246
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		482
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		1

Provider	Database	Justification	Limits applied	Number*
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		38
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		45
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		18
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		74
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		2

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

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

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

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

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

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

Table 9.5-5: Detailed Search Parameters for Reference Lists

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

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

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	Number (Top-Up Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	1295
Number of *summary records* excluded from the search results after rapid assessment for relevance	1136
Total number of *full-text* documents assessed in detail*	159
Number of *studies* excluded from further consideration after detailed assessment for relevance	105
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	56

*both from bibliographic databases and other sources of peer-reviewed literature

For the initial rapid assessment, the study titles were scanned to identify whether the studies were indeed relevant to ecotoxicology or not – for example, any studies clearly not in the remit of the European review (such as studies about Brazilian species); or unambiguously belonging to other sections such as environmental fate or efficacy (the majority of the references found), were excluded.

Applicant has additionally reviewed one publication (Jin *et al*., 2011) as outlined in Stop the Clock request 60.

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

CA data point number	Author(s)	Year	Title	Source
CA 8.0	Ye, J., Liu, J., Liu, W., Zhao, M., Liu, W.	2010	Enantioselectivity in environmental risk assessment of modern chiral pesticides.	Environmental Pollution, (July 2010) Vol. 158, No. 7, pp. 2371-2383. Refs: 69. ISSN: 0269-7491 CODEN: ENPOEK
CA 8.1.1.3	Keseru, M., Juhasz, E., Szabo, R., Tavaszi, J., Varnagy, L.	2007	Study of the individual toxicity of three pesticides in a teratogenicity test on birds. Harom noevenyvedo szer egyedi mereghatasanak vizsgalata madarteratologiai tesztben.	Noevenyvedelem (2007), Vol. 43, Number 3, pp. 113-119, 23 refs. ISSN: 0133-0829
CA 8.1.1.3	Varnagy, L., Budai, P., Fejes, S., Keseru, M., Szabo, R.. Juhasz, E.	2004	Degredation dynamics and toxicity of certain pesticide active ingredients in bird embryos.	Magyar Allatorvosok Lapja (2004), Volume 126, Number 12, pp. 755-760, 21 refs. ISSN: 0025-004X
CA 8.1.2	Greenlee, A.R., Ellis, T.M., Berg, R.L.	2004	Low-dose agrochemicals and lawn-care pesticides induce developmental toxicity in murine preimplantation embryos.	Environmental health perspectives, (2004 May) Vol. 112, No. 6, pp. 703-9. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1241965.
CA 8.1.4 CA 8.2.1 CA 8.2.4.1 CA 8.2.4.2	Wan, M. T., Buday, C., Schroeder, G., Kuo, J., Pasternak, J.	2006	Toxicity to *Daphnia magna*, *Hyalella azteca*, *Oncorhynchus kisutch*, *Oncorhynchus mykiss*, *Oncorhynchus tshawytscha* and *Rana catesbeiana* of atrazine, metolachlor, simazine, and their formulated products.	Bulletin of Environmental Contamination and Toxicology (2006) Volume 76, Number 1, pp. 52-58, 9 refs. ISSN: 0007-4861. DOI: 10.1007/s00128-005-0888-4

CA data point number	Author(s)	Year	Title	Source
CA 8.1.4	De Solla, S.R., Palonen K.E., Martin P.A.	2014	Toxicity of pesticides associated with potatoe production, including soil fumigants, to snapping turtle eggs (*Cheludra serpentine*).	Environmental toxicology and chemistry/SETAC (2014 Jan) 33 (1): 102-106.
CA 8.1.4	De Solla, S.R., Martin, P.A	2011	Absorption of current use pesticides by snapping turtle (*Chelydra serpentina*) eggs in treated soil.	Chemosphere, (2011 Oct) Vol. 85, No. 5, pp. 820-5. Electronic Publication Date: 8 Sep 2011. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535
CA 8.1.4	De Solla, S., Martin, P.	2010	Relationship between pesticide properties and absorption in turtles eggs from treated soil.	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 64. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.
CA 8.1.4	Papoulias, D.M. , Schwarz, M.S., Mena, L.	2013	Gonadal abnormalities in frogs (*Lithobates* spp.) collected from managed wetlands in an agricultural region of Nebraska, USA.	Environmental Pollution, (January 2013) Vol. 172, pp. 1-8. Refs: 78. ISSN: 0269-7491; E-ISSN: 1873-6424; CODEN: ENPOEK
CA 8.1.4	Spolyarich N., Hyne R.V., Wilson S.P., Palmer C.G., Byrne M.	2011	Morphological abnormalities in frogs from a rice-growing region in NSW, Australia, with investigations into pesticide exposure.	Environmental monitoring and assessment, (2011 Feb) Vol. 173, No. 1-4, pp.397-407. Journal code: 8508350. E-ISSN: 1573-2959. L-ISSN: 0167-6369.
CA 8.1.4	Spolyarich N., Hyne, R., Wilson S., Palmer C., Byrne M.	2010	Growth, development and sex ratios of Spotted Marsh Frog (*Limnodynastes tasmaniensis*) larvae exposed to atrazine and a herbicide mixture.	Chemosphere, (2010 Feb) Vol. 78, No. 7, pp. 807-13. Electronic Publication Date: 30 Dec 2009. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.
CA 8.1.4	Williams, B.K., Semlitsch, R.D.	2010	Larval responses of three Midwestern anurans to chronic, low-dose exposures of four herbicides.	Arch. Environ. Contam. Toxicol. (2010) 58, 819-827.
CA 8.1.4	Jin, Y., Chen, R., Wang, L., Liu, J., Yang, Y., Zhou, C., Liu, W., Fu, Z	2011	Effects of metolachlor on transcription of thyroid system-related genes in juvenile and adult Japanese medaka (*Oryzias latipes*)	General and Comparative Endocrinology, 170:487-493
CA8.1.4 CA 8.5	Papaefthimiou, C., Cabral, M. de G., Mixailidou, C., Viegas, C.A., Sa-Correia, I., Theophilidis, G.	2004	Comparison of two screening bioassays, based on the frog sciatic nerve and yeast cells, for the assessment of herbicide toxicity.	Environmental toxicology and chemistry / SETAC, (2004 May) Vol. 23, No. 5, pp. 1211-8. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.
CA 8.2	Caquet Th., Roucaute M; Mazzella N; Delmas F; Madigou C; Farcy E; Burgeot Th; Allenou J-P; Gabellec R	2013	Risk assessment of herbicides and booster biocides along estuarine continuums in the Bay of Vilaine area (Brittany, France).	Environmental science and pollution research international, (2013 Feb) Vol. 20, No. 2, pp. 651-66. Electronic Publication Date: 16 Sep 2012 Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.

CA data point number	Author(s)	Year	Title	Source
CA 8.2	Kolpin, D.W., Hubbard, L.E.,. Blazer, V.S., Young, J.A., Iwanowicz, L.R., Gray, J.L., Foreman, W.T., Furlong, E.T., Zaugg, S.D., Sandstrom, M.W., Focazio, M.J., Alvarez, D.A., Speiran, G.K., Meyer, M.T., Barber, L.B.	2013	Chemical contaminants in water and sediment near fish nesting sites in the Potomac River basin: Determining potential exposures to smallmouth bass (*Micropterus dolomieu*).	Science of the Total Environment, (5 Jan 2013) Vol. 443, pp. 700-716. Refs: 85. ISSN: 0048-9697; E-ISSN: 1879-1026 CODEN: STEVA8
CA 8.2	Hayes, T.B., Case, P., Chui, S., Chung D., Haeffele, C., Haston, K., Lee, M., Mai, V.P,., Marjuoa, Y., Parker, J., Tsui, M.	2006	Pesticide mixtures, endocrine disruption, and amphibian declines: are we underestimating the impact?	Environmental health perspectives, (2006 Apr) Vol. 114 Suppl 1, pp. 40-50. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1874187.
CA 8.2	Berube, V.E., Boily, M.H, DeBlois, C., Dassylva, N., Spear, P.A.	2005	Plasma retinoid profile in bullfrogs, *Rana catesbeiana*, in relation to agricultural intensity of sub-watersheds in the Yamaska River drainage basin, Quebec, Canada.	Aquatic toxicology (Amsterdam, Netherlands), (2005 Jan 26) Vol. 71, No. 2, pp. 109-20. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.
CA 8.2	Dussault, S., Fortier, M., Boily, M., Brousseau, P., Fournier, M.	2010	Immune status of the bullfrog (*Rana catesbeiana*) exposed to agripesticides	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 66. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.
CA 8.2	Shutler, D., Marcogliese, D.J.	2011	Leukocyte profiles of Northern Leopard Frogs, *Lithobates pipiens*, exposed to pesticides and hematozoa in agricultural wetlands.	Copeia (2011), Number 2, pp. 301-307. ISSN: 0045-8511
CA 8.2	McDaniel, T.V., Martin, P.A., Struger, J., Sherry, J., Marvin, C.H., McMaster, M.E., Clarence, S., Tetreault, G.	2008	Potential endocrine disruption of sexual development in free ranging male northern leopard frogs (*Rana pipiens*) and green frogs (*Rana clamitans*) from areas of intensive row crop agriculture. [Erratum to document cited in CA149:301052]	Aquatic Toxicology (2008), 90 (1), 82. CODEN: AQTODG; ISSN: 0166-445X
CA 8.2	Solis, M.E., Liu, C.C., Nam, P., Niyogi, D.K., Bandeff, J.M., Huang, Y.-W.	2007	Occurrence of organic chemicals in two rivers inhabited by Ozark hellbenders (*Cryptobranchus alleganiensis bishopi*)	Archives of Environmental Contamination and Toxicology (2007), 53 (3), 426-434. CODEN: AECTCV; ISSN: 0090-4341
CA 8.2	Gutierrez, M.M.	2007	Evidence of endocrine disruption in amphibians due to agricultural chemical exposure.	Dissertation Abstracts International. Vol. 69, no. 6. 2007. Dissertation Number: AAI3319626. ISSN: 0419-4217 Published by: University Microfilms International, P.O. Box 1764, Ann Arbor, MI, 48106, USA

CA data point number	Author(s)	Year	Title	Source
CA 8.2	Ayansina, A.D.V., Muhammad, R.G.	2014	An evaluation of the effect of four herbicides on some aquatic organisms.	International Journal of Biological and Chemical Sciences (2014), Volume 8, Number 1, pp. 304-313, 23 refs. ISSN: 1991-8631
CA 8.2.1	Perez, J.R.	2011	Effects of s-triazines and metolachlor on chlorpyrifos toxicity in Zebrafish (*Danio rerio*) early life-stages	Conference: 21st Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2011), Milano Convention Centre, Milan, 15 May 2011 - 19 May 2011
CA 8.2.1	Polard T., Jean, S., Gauthier, L., Laplanche, C., Merlina, G., Sanchez-Perez J.M., Pinelli, E.	2011	Mutagenic impact on fish of runoff events in agricultural areas in south-west France.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Jan 17) Vol. 101, No. 1, pp. 126-34. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.1	Tierney, K.B., Sampson, J.L., Kennedy, C.J., Ross, P.S., Sekela, M.A., Kennedy, C. J.	2008	Salmon olfaction is impaired by an environmentally realistic pesticide mixture.	Environmental Science and Technology, (1 Jul 2008) Vol. 42, No. 13, pp. 4996-5001. Refs: 26. ISSN: 0013-936X; CODEN: ESTHAG
CA 8.2.1	Haluzova, I., Modra, H., Mikula, P., Svobodova, Z.	2009	Subchronic exposure of the common carp (*Cyprinus carpio*) to four herbicide formulations: Effect on the haematological indice.	Toxicology Letters (Shannon), (SEP 13 2009) Vol. 189, No. Sp. Iss. SI, pp. S210. Meeting Info.: 46th Congress of the European-Societies-of-Toxicology. Dresden, GERMANY. September 13 -16, 2009. CODEN: TOLED5. ISSN: 0378-4274. DT Conference; (Meeting)
CA 8.2.1	Dobsikova, R., Blahova, J., Modra, H., Skoric, M., Svobodova, Z.	2011	The effect of acute exposure to herbicide Gardoprim Plus Gold 500 SC on haematological and biochemical indicators and histopathological changes in common carp (*Cyprinus carpio* L.).	Acta Veterinaria Brno (2011) Volume 80, Number 4, pp. 359-363, 14 refs. ISSN: 0001-7213. DOI: 10.2754/avb201180040359
CA 8.2.1	Buckler, D.R., Mayer, F.L., Ellersieck, M.R., Asfaw, A.	2005	Acute Toxicity Value Extrapolation with Fish and Aquatic Invertebrates	Archives of Environmental Contamination and Toxicology (2005), 49 (4), 546-558. CODEN: AECTCV; ISSN: 0090-4341
CA 8.2.1	Zhou, B., Zhao, M.-R., Huang, H.-F.	2008	Study on zebrafish embryo-toxicity of four pesticides	Zhejiang Gongye Daxue Xuebao (2008), 36 (2), 136-140. ISSN: 1006-4303
CA 8.2.1	Babatunde, M.M., Balogun, J.K., Auta, J., Balarabe, M.L., Auta, J., Balogun, J.K., Bolorunduro, P.I., Editor(s): Onimisi, H.U.	2009	Acute toxicity of galex to *Oreocromis niloticus* (Trewavas) in Nigeria	Proceedings of the 23rd annual conference of the Fisheries Society of Nigeria. pp. 159-164. 2009. Conference: 23rd annual conference of the fisheries Society of Nigeria (FISON), Kaduna (Nigeria), 26-30 Oct 2008
CA 8.2.1	Ubachukwu, P.O., Oluah, N.S., Omeje, C.U., Ikele, C.B.	2012	Effect of herbicide (Primextra) on tissue cholesterol level in *Clarias gariepinus* juvenile.	Animal Research International (2012), Volume 9, Number 1, pp. 1524-1528, 16 refs. ISSN: 159-3115

CA data point number	Author(s)	Year	Title	Source
CA 8.2.1 CA 8.2.4 CA 8.2.6	Passy, S.I., Bode, R.W., Carlson, D. M., Novak, M. A.	2004	Comparative environmental assessment in the studies of benthic diatom, macroinvertebrate, and fish communities	International Review of Hydrobiology (2004), 89 (2), 121-138. ISSN: 1434-2944
CA 8.2.2.1	Padilla, S., Corum, D., Padnos, B., Hunter, D. L., Beam, A.; Houck, K.A., Sipes, N., Kleinstreuer, N., Knudsen, T., Dix, D.J., Reif, D.M.	2012	Zebrafish developmental screening of the ToxCast Phase I chemical library	Reproductive Toxicology (2012), 33 (2), 174-187. CODEN: REPTED; ISSN: 0890-6238
CA 8.2.4.1	Souissi Y., Bouchonnet, S; Bourcier, S; Kusk K. O.; Sablier M., Andersen H. R.	2013	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water.	The Science of the total environment, (2013 Aug 1) Vol. 458-460, pp. 527-34. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697
CA 8.2.4.1 CA 8.2.5.1 CA 8.5	Liu, W., Fang, Q., Ma, Y.	2005	Selectivity in aquatic toxicity and biodegradation of the herbicide Metolachlor	Abstracts of Papers, 230th ACS National Meeting, Washington, DC, United States, Aug. 28-Sept. 1, 2005 (2005), AGRO-060. Publisher: American Chemical Society, Washington, D. C. CODEN: 69HFCL
CA 8.2.4.1 CA 8.2.6.1	Kyriakopoulou, K., Anastasiadou, P., Machera, K.	2009	Comparative Toxicities of Fungicide and Herbicide Formulations on Freshwater and Marine Species	Bulletin of Environmental Contamination and Toxicology (2009), 82 (3), 290-295. CODEN: BECTA6; ISSN: 0007-4861
CA 8.2.5.1	Liu, H., Zhan, X., Ye, W., Liu, W.	2005	Ecotoxicological difference of chiral pesticides: chronic toxicity of metolachlor and S-metolachlor to *Daphnia magna*	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 492-496. CODEN: PEACF2; ISSN: 1524-6434
CA 8.2.5.1	Liu, H.J., Ye, W.H., Zhan, X.M., Liu, W.P.	2006	A comparative study of rac- and S-metolachlor toxicity to *Daphnia magna*	Ecotoxicology and Environmental Safety (2006) Volume 63, Number 3, pp. 451-455, 25 refs. ISSN: 0147-6513. DOI: 10.1016/j.ecoenv.2005.02.002
CA 8.2.5.2	Cook, M.E., Moore, P.A.	2008	The effects of the herbicide metolachlor on agonistic behavior in the crayfish, *Orconectes rusticus*.	Archives of environmental contamination and toxicology, (2008 Jul) Vol. 55, No. 1, pp. 94-102. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.
CA 8.2.5.2	Gagnaire, B., Thomas-Guyon, H., Burgeot, Th., Renault, T.	2006	Pollutant effects on Pacific oyster, *Crassostrea gigas* (Thunberg), hemocytes: Screening of 23 molecules using flow cytometry.	Cell Biology and Toxicology (2006), 22 (1), 1-14. CODEN: CBTOE2; ISSN: 0742-2091
CA 8.2.5.2	Liu, H.J.	2006	Ecotoxicological difference of Rac-Metolachlor and S-Metolachlor	Conference: 16th Europe Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), World Forum Convention Center, Hague (Netherlands (The)), 7 May 2006 - 11 May 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)

CA data point number	Author(s)	Year	Title	Source
CA 8.2.5.2	Praet, N. van; Bruyn, L. de; Jonge, M. de; Vanhaecke, L.; Stoks, R.; Bervoets, L.; van Praet, N.; de Bruyn, L.; de Jonge, M.	2014	Can damsel fly larvae (*Ischnura elegans*) be used as bioindicators of sublethal effects of environmental contamination?	Aquatic Toxicology (2014), Volume 154, pp. 270-277. ISSN: 0166-445X
CA 8.2.5.2	Lizotte, R., Testa, S., Locke, M., Martin. A, Steinriede, R.W.	2013	Responses of phytoplankton and *Hyalella azteca* to agrichemical mixtures in a constructed wetland mesocosm.	Archives of environmental contamination and toxicology, (2013 Oct) Vol. 65, No. 3, pp. 474-85. Electronic Publication Date: 23 Jun 2013. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.
CA 8.2.5.2	Lizotte, R.E., Shields, F.D., Testa, S.	2012	Effects of a simulated agricultural runoff event on sediment toxicity in a managed backwater wetland	Water, air, and soil pollution (2012), Volume 223, Number 8, pp. 5375-5389. ISSN: 1573-2932
CA 8.2.5.2	Lizotte, R.E., Knight, S.S., Bryant, C.T., Smith, S.	2009	Agricultural Pesticides in Mississippi Delta Oxbow Lake Sediments During Autumn and Their Effects on *Hyalella azteca*.	Archives of Environmental Contamination and Toxicology, (OCT 2009) Vol.57, No. 3, pp. 495-503. CODEN: AECTCV. ISSN: 0090-4341.
CA 8.2.5.2	Lizotte, R.E., Knight, S.S., Shields, F.D., Bryant, C.T.	2009	Effects of an atrazine, metolachlor and fipronil mixture on *Hyalella azteca* (Saussure) in a modified backwater wetland.	Bulletin of environmental contamination and toxicology, (2009 Dec) Vol. 83, No. 6, pp. 836-40. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.
CA 8.2.5.2	Moore, M.T. (Reprint Author), Lizotte, R.E., Cooper, C.M., Smith, S., Knight, S.S.	2004	Survival and growth of *Hyalella azteca* exposed to three Mississippi Oxbow lake Sediments.	Bulletin of Environmental Contamination and Toxicology, (April 2004) Vol. 72, No. 4, pp. 777-783. ISSN: 0007-4861.
CA 8.2.5.2	Perez, J.R., Loureiro, S.M., Soares, A.M.V.M.	2010	Effects of atrazine and metolachlor on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23 May 2010-27 May 2010
CA 8.2.5.2	Loureiro, S., Perez, J.R., Soares, A.M.V.M.	2010	Effects of atrazine, metolachlor and endosulfan on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23-27 May 2010
CA 8.2.5.2	Gerhardt, A., Koster, M., Lang, F., Leib, V.	2012	Active in situ biomonitoring of pesticide pulses using *Gammarus* spp. In small tributaries of lake Constance	Journal of Environmental Protection (2012), 3 (7), 573-583. ISSN: 2152-2197
CA 8.2.5.2	Guy, M., Singh, L., Mineau, P.	2011	Using field data to assess the effects of pesticides on crustacea in freshwater aquatic ecosystems and verifying the level of protection provided by water quality guidelines	Integrated Environmental Assessment and Management (2011), 7 (3), 426-436. CODEN: IEAMCK; ISSN: 1551-3777

CA data point number	Author(s)	Year	Title	Source
CA 8.2.5.2	Collin, H., Meistertzheim, A.-L., David, E., Moraga, D., Boutet, I.	2010	Response of the Pacific oyster *Crassostrea gigas*, Thunberg 1793, to pesticide exposure under experimental conditions.	The Journal of experimental biology, (2010 Dec 1) Vol. 213, No. Pt 23, pp. 4010-7. Journal code: 0243705. E-ISSN: 1477-9145. L-ISSN: 0022-0949.
CA 8.2.5.2	Gagnaire, B., Gay, M., Huvet, A., Daniel, J-Y., Saulnier, D., Renault, T.	2007	Combination of a pesticide exposure and a bacterial challenge: in vivo effects on immune response of Pacific oyster, *Crassostrea gigas* (Thunberg).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Aug 15) Vol. 84, No.1, pp. 92-102. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.
CA 8.2.5.2	Gagnaire, B., Burgeot, T., Geret, F., Thomas-Guyon, H., Renault, T., Editor(s): Feunteun, E., Miramand, P.	2006	Effect of heavy metals and herbicides on immune capacities in Pacific oyster, *Crassostrea gigas*. 599/1308	Cahiers de Biologie Marine (2006) Volume 47, Number 1, pp. 105-107, 7 refs. ISSN: 0007-9723
CA 8.2.5.2	Geret, F., Burgeot T., Haure J., Gagnaire B., Renault T., Communal P.Y., Samain, J.F.	2013	Effects of low-dose exposure to pesticide mixture on physiological responses of the Pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2013 Dec) Vol. 28, No. 12, pp. 689-99. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.
CA 8.2.5.2	Geret, F., Burgeot, T., Haure, J., Gagnaire, B., Renault, T., Communal, P.Y., Samain, J.F.	2011	Effects of low-dose exposure to pesticide mixture on physiological responses of the pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2011 Oct 19). Electronic Publication Date: 19 Oct 2011. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.
CA 8.2.5.2	Geret, F., Gagnaire, B., Menard, D., Renault, T., Le Roux, A., Haure, J., Bocquene, G., Burgeot, T.	2004	Response of the pacific oyster *Crassostrea gigas* to pesticide exposition under experimental conditions.	Marine Environmental Research, (August 2004) Vol. 58, No. 2-5, pp. 312-313. Meeting Info.: 12th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 12). Safety Harbor, FL, USA. May 09-13, 2003. CODEN: MERSDW. ISSN: 0141-1136.
CA 8.2.5.2	Mai, H., Gonzalez, P., Pardon, P., Tapie, N., Budzinski, H., Cachot, J., Morin, B.	2014	Comparative responses of sperm cells and embryos of Pacific oyster (*Crassostrea gigas*) to exposure to metolachlor and its degradation products.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 48-56. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.5.2	Mai, H., Morin, B., Pardon P., Gonzalez P., Budzinski H., Cachot J.	2013	Environmental concentrations of irgarol, diuron and S-metolachlor induce deleterious effects on gametes and embryos of the Pacific oyster, *Crassostrea gigas*.	Marine environmental research, (2013 Aug) Vol. 89, pp. 1-8. Journal code: 9882895. E-ISSN: 1879-0291. L-ISSN: 0141-1136.
CA 8.2.5.2	Mai, H., Cachot, J., Brune, J., Geffard, O., Belles, A., Budzinski, H., Morin, B.	2012	Embryotoxic and genotoxic effects of heavy metals and pesticides on early life stages of Pacific oyster (*Crassostrea gigas*).	Marine pollution bulletin, (2012 Dec) Vol. 64, No. 12, pp. 2663-70. Journal code: 0260231. E-ISSN: 1879-3363. L-ISSN: 0025-326X.
CA 8.2.5.2	Auby, I; Bocquene, G; Quiniou, F; Dreno, J.P.	2007	Arcachon basin 's weedkillers and insecticides contamination analysis (2005-2006 period) environmental impact.	Plouzane (France). 2007. Published by: Plouzane (France)

CA data point number	Author(s)	Year	Title	Source
CA 8.2.5.2	Birchfield, N., Corbin, M., Doelling-Brown, P., Hurley, P.	2006	Risk Assessment of Racemic Metolachlor use to 26 Evolutionarily Significant Units of Endangered and Threatened Pacific Salmon and Steelhead	Conference: 27th Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), Montreal, Quebec (Canada), 3 Nov 2006 - 9 Nov 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)
CA 8.2.5.2	Belanger, R.M., Sabhapathy, G.S., Khan, S.	2014	Atrazine and metolachlor exposure affects the chemosensory responses of male crayfish (*Orconectes rusticus*) to female odors.	Integrative and Comparative Biology, (2014) Vol. 54, No. Suppl. 1, pp. E15. http://icb.oxfordjournals.org/. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative- Biology. Austin, TX, USA. Jan. 03-07, 2014. ISSN: 1540-7063. E-ISSN: 1557-7023.
CA 8.2.5.2	Sanchez-Bayo, F.	2006	Comparative acute toxicity of organic pollutants and reference values for crustaceans. I. Branchiopoda, Copepoda and Ostracoda	Environmental Pollution (Amsterdam, Netherlands) (2006), 139 (3), 385-420 CODEN: ENPOEK; ISSN: 0269-7491
CA 8.2.5.2	Smalling, K.L., Morgan, S., Kuivila, K.K.	2010	Accumulation of current-use and organochlorine pesticides in crab embryos from northern California, USA	Environmental Toxicology and Chemistry (2010), 29 (11), 2593-2599. CODEN: ETOCDK; ISSN: 0730-7268
CA 8.2.5.2	Toropov, A.A., Benfenati, E.	2006	QSAR models for *Daphnia* toxicity of pesticides based on combinations of topological parameters of molecular structures 417/559	Bioorganic & Medicinal Chemistry (2006), 14 (8), 2779-2788. CODEN: BMECEP; ISSN: 0968-0896
CA 8.2.5.4	Jin-Clark, Y., Anderson, T.D., Zhu, K.Y.	2008	Effect of alachlor and metolachlor on toxicity of chlorpyrifos and major detoxification enzymes in the aquatic midge, *Chironomus tentans* (Diptera: Chironomidae).	Archives of environmental contamination and toxicology, (2008 May) Vol. 54, No. 4, pp. 645-52. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.
CA 8.2.5.4	Perez, J., Monteiro, M.S., Quintaneiro C., Soares, A.M.V.M., Loureiro, S.	2013	Characterization of cholinesterases in *Chironomus riparius* and the effects of three herbicides on chlorpyrifos toxicity.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Nov 15) Vol. 144-145, pp. 296-302. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.6.1	Fischer, B. B.; Roffler, S.; Eggen, R. I. L.	2012	Multiple stressor effects of predation by rotifers and herbicide pollution on different *Chlamydomonas* strains and potential impacts on population dynamics.	Environmental Toxicology and Chemistry (2012) Volume 31, Number 12, pp. 2832-2840, 43 refs. ISSN: 0730-7268. DOI: 10.1002/etc.2010
CA 8.2.6.1	Cai, W,-D., Liu H.-J., Fang Z.-G.	2012	Toxicity effects of Rac- and S-metolachlor on two algaes.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2012 Feb) Vol. 33, No. 2, pp. 448-53. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.

CA data point number	Author(s)	Year	Title	Source
CA 8.2.6.1	Liu, H.J., Cai, W.D., Huang, R.N., Xia, H.L., Wen, Y.Z.	2012	Enantioselective toxicity of metolachlor to *Scenedesmus obliquus* in the presence of cyclodextrins.	Chirality, (2012 Feb) Vol. 24, No. 2, pp. 181-7. Electronic Publication: 2011-12-19. Journal code: 8914261. E-ISSN: 1520-636X. L-ISSN: 0899-0042.
CA 8.2.6.1	Liu, H., Xiong, M.	2009	Comparative toxicity of racemic metolachlor and S-metolachlor to *Chlorella pyrenoidosa*.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 28) Vol. 93, No. 2-3, pp. 100-6. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.6.2	Spoljaric, D., Cipak, A., Horvatic, J., Andrisic, L., Waeg, G., Zarkovic, N., Jaganjac, M.	2011	Endogenous 4-hydroxy-2-nonenal in microalga *Chlorella kessleri* acts as a bioactive indicator of pollution with common herbicides and growth regulating factor of hormesis.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Oct) Vol. 105, No. 3-4, pp. 552-8. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.6.1	Vallotton, N., Moser, D., Eggen R.I.L., Junghans, M., Chevre, N.	2008	S-metolachlor pulse exposure on the alga *Scenedesmus vacuolatus*: effects during exposure and the subsequent recovery.	Chemosphere, (2008 Sep) Vol. 73, No. 3, pp. 395-400. Electronic Publication: 2008-07-07. Journal code: 0320657. ISSN: 0045-6535. L-ISSN: 0045-6535.
CA 8.2.6.1	Deng, L., Senseman, S.A., Gentry, T.J., Zuberer, D.A., Weiss, T.L., Devarenne, T.P., Camargo, E.R.	2012	Effect of selected herbicides on growth and hydrocarbon content of *Botryococcus braunii* (Race B)	Industrial Crops and Products (2012), 39, 154-161. CODEN: ICRDEW; ISSN: 0926-6690
CA 8.2.6.1	Sbrilli, G., Bimbi, B., Cioni, F., Pagliai, L., Luchi, F., Lanciotti, E.	2005	Surface and ground waters characterization in Tuscany (Italy) by using algal bioassay and pesticide determinations: comparative evaluation of the results and hazard assessment of the pesticides impact on primary productivity	Chemosphere (2005), 58 (5), 571-578. CODEN: CMSHAF; ISSN: 0045-6535
CA 8.2.6.1	Perez, J., Domingues, I., Soares, A.M.V.M., Loureiro, S.	2011	Growth rate of *Pseudokirchneriella subcapitata* exposed to herbicides found in surface waters in the Alqueva reservoir (Portugal): a bottom-up approach using binary mixtures.	Ecotoxicology (London, England), (2011 Aug) Vol. 20, No. 6, pp. 1167-75. Journal code: 9885956. E-ISSN: 1573-3017. L-ISSN: 0963-9292.
CA 8.2.6.1	Ma, J., Wang, S., Wang, P., Ma, L., Chen, X., Xu, R.	2006	Toxicity assessment of 40 herbicides to the green alga *Raphidocelis subcapitata*	Ecotoxicology and Environmental Safety (2006), 63 (3), 456-462. CODEN: EESADV; ISSN: 0147-6513
CA 8.2.6.1	Chalifour, A., Spear, P.A., Boily, M.H., DeBlois, C., Giroux, I., Dassylva, N., Juneau, P.	2009	Assessment of toxic effects of pesticide extracts on different green algal species by using chlorophyll a fluorescence	Toxicological and Environmental Chemistry (2009), 91 (7), 1315-1329. CODEN: TECSDY; ISSN: 0277-2248
CA 8.2.6.1	Vogwill, T., Lagator, M., Colegrave, N., Neve, P.	2012	The experimental evolution of herbicide resistance in *Chlamydomonas reinhardtii* results in a positive correlation between fitness in the presence and absence of herbicides	Journal of Evolutionary Biology (2012), 25 (10), 1955-1964. ISSN: 1010-061X
CA 8.2.6.1 CA 8.2.6.2	Ebenezer, V., Ki, J.-S.	2013	Quantification of toxic effects of the herbicide metolachlor on marine microalgae *Ditylum brightwellii* (Bacillariophyceae), *Prorocentrum minimum* (Dinophyceae), and *Tetraselmis suecica* (Chlorophyceae).	Journal of microbiology (Seoul, Korea), (2013 Feb) Vol. 51, No. 1, pp. 136-9. Journal code: 9703165. E-ISSN: 1976-3794. L-ISSN: 1225-8873.

CA data point number	Author(s)	Year	Title	Source
CA 8.2.6.1 CA 8.2.6.2	Thakkar, M., Randhawa, V., Wei, L.	2013	Comparative responses of two species of marine phytoplankton to metolachlor exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Jan 15) Vol. 126, pp. 198-206. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
CA 8.2.6.2	Fiori E., Pistocchi R.	2014	*Skeletonema marinoi* (Bacillariophyceae) sensitivity to herbicides and effects of temperature increase on cellular responses to terbuthylazine exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 112-20. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X
CA 8.2.6.2	Larras, F., Bouchez, A., Rimet, F., Montuelle, B.	2012	Using bioassays and species sensitivity distributions to assess herbicide toxicity towards benthic diatoms.	PloS one, (2012) Vol. 7, No. 8, pp. e44458. Electronic Publication: 2012-08-30.
CA 8.2.6.2	Larras, F., Montuelle, B., Bouchez, A.	2013	Assessment of toxicity thresholds in aquatic environments: does benthic growth of diatoms affect their exposure and sensitivity to herbicides?	The Science of the total environment, (2013 Oct 1) Vol. 463-464, pp. 469-77. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697.
CA 8.2.6.2	Hu, X.-N., Zhang, S.-X., Chen, C.-D., Liu, H.-J,.	2014	Influence of the coexistence of Zn2+ on the enantioselective toxicity of metolachlor to *Scenedesmus obliquus*.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2014 Jan) Vol. 35, No. 1, pp. 292-8. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.
CA 8.2.6.2	Roubeix, V., Fauvelle, V., Tison-Rosebery, J., Mazzella, N., Coste M., Delmas F.	2012	Assessing the impact of chloroacetanilide herbicides and their metabolites on periphyton in the Leyre River (SW France) via short term growth inhibition tests on autochthonous diatoms.	Journal of environmental monitoring : JEM, (2012 May) Vol. 14, No. 6, pp. 1655-63. Journal code: 100968688. E-ISSN: 1464-0333. L-ISSN: 1464-0325.
CA 8.2.6.2	Roubeix, V., Mazzella, N., Mechin, B., Coste, M., Delmas, F.	2011	Impact of the herbicide metolachlor on river periphytic diatoms: experimental comparison of descriptors at different biological organization levels.	Annales de Limnologie - International Journal of Limnology (2011) Volume 47, Number 3, pp. 239-249, 46 refs. ISSN: 0003-4088. DOI: 10.1051/limn/2011009
CA 8.2.6.2	Debenest, T., Pinelli, E., Coste, M., Silvestre, J., Mazzella, N., Madigou, C., Delmas, F.	2009	Sensitivity of freshwater periphytic diatoms to agricultural herbicides.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 4) Vol. 93, No. 1, pp. 11-7. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X
CA 8.2.6.2	Sangwan, M., Wei, L.	2008	Effect of herbicide metolachlor on brown tide alga *Aureococcus anophagefferens* growth and detoxification.	Abstracts of Papers American Chemical Society, (AUG 17 2008) Vol. 236, pp. 122-ENVR. Meeting Info.: 236th National Meeting of the American-Chemical-Society. Philadelphia, PA, USA. August 17 -21, 2008. CODEN: ACSRAL. ISSN: 0065-7727.
CA 8.2.6.2	Rea, G., Polticelli, F., Antonacci, A., Scognamiglio, V., Katiyar, P., Kulkarni, S.A., Johanningmeier, U., Giardi, M.T.	2009	Structure-based design of novel *Chlamydomonas reinhardtii* D1-D2 photosynthetic proteins for herbicide monitoring	Protein Science (2009), 18 (10), 2139-2151. CODEN: PRCIEI; ISSN: 1469-896X

CA data point number	Author(s)	Year	Title	Source
CA 8.2.6.2	Ishihara, S., Horio, T., Kobara, Y., Yokoyama, A.	2006	Evaluation of herbicide effects on micro algal cells by flow cytometric analysis	Zasso Kenkyu (2006), 51 (4), 239-248. CODEN: ZASKAN; ISSN: 0372-798X
CA 8.2.6.2	Zablotowicz, R.M., Locke, M.A., Lerch, R.N., Knight, S.S.	2004	Dynamics of herbicide concentrations in Mississippi Delta Oxbow Lakes and the role of planktonic microorganisms in herbicide metabolism	ACS Symposium Series (2004), 877 (Water Quality Assessments in the Mississippi Delta), 134-149. CODEN: ACSMC8; ISSN: 0097-6156
CA 8.2.7	Brain, R.A., Hoberg, J. Hosmer, A.J., Wall, S.B.	2012	Influence of light intensity on the toxicity of atrazine to the submerged freshwater aquatic macrophyte *Elodea canadensis*	Ecotoxicology and Environmental Safety, (1 May 2012) Vol. 79, pp. 55-61. ISSN: 0147-6513.
CA 8.2.7	Fulton, B., Brain, R., Brooks, B.	2007	Responses of *Lemna gibba* Exposed to an Equitoxic Mixture of Triclosan and Metolachlor Across a Range of Nitrogen and Phosphorous Ratios.	Conference: 28th Annual Meeting of the Society of Environmental Toxicology and Chemistry North America, Midwest Express Center, Milwaukee, Wisconsin (USA), 11 Nov 2007- 15 Nov 2007. Sponsor(s): The Society of Environmental Toxicology and Chemistry (SETAC)
CA 8.2.7	Fulton, B., Brain, R.A., Belden, J.B., Brooks, B.W.	2007	Individual and Combined Effects of Triclosan and Metolachlor on *Lemna Gibba*	Conference: 2007 Summer Speciality Conference of the American Water Resources Association (AWRA 2007), Vail Cascade Resort, Vail, Colorado (USA), 25 Feb 2007 - 27 Feb 2007. Sponsor(s): American Water Resources Association
CA 8.2.7 CA8.6	Cedergreen N., Spliid, N.H., Streibig, J.C.	2004	Species-specific sensitivity of aquatic macrophytes towards two herbicide	Ecotoxicology and Environmental Safety, (Jul 2004) Vol. 58, No. 3, pp. 314-323. ISSN: 0147-6513.
CA 8.3.1	Helmer, S.H., Kerbaol, A., Aras, P., Jumarie, C., Boily, M.	2014	Effects of realistic doses of atrazine, metolachlor, and glyphosate on lipid peroxidation and diet-derived antioxidants in caged honey bees (*Apis mellifera*).	Environmental science and pollution research international, (2014 Apr 15) Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.
CA 8.3.1	Zhan, X., Liu, H., Miao, Y., Liu, W., Zhan, X.M., Liu, H.J., Miao, Y.G., Liu, W.P.	2006	A comparative study of rac- and S-metolachlor on some activities and metabolism of silkworm, *Bombyx mori* L.	Pesticide Biochemistry and Physiology (2006) Volume 85, Number 3, pp. 133-138, 33 refs. ISSN: 0048-3575. DOI: 10.1016/j.pestbp.2005.12.003
CA 8.3.1	Genersch, E., von der Ohe, W., Kaatz, H., Schroeder, A., Otten, C., Buechler, R., Berg, S., Ritter, W., Muehlen, W., Gisder, S., Meixner, M., Liebig, G., Rosenkranz, P.	2010	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	Apidologie (2010), 41 (3), 332-352. CODEN: APDGB5; ISSN: 0044-8435
CA 8.3.2	Carmo, E.L., Bueno, A.F., Bueno, R.C.O.F.	2010	Pesticide selectivity for the insect egg parasitoid *Telenomus remus*.	BioControl (2010) Volume 55, Number 4, pp. 455-464, 38 refs. ISSN: 1386-6141

CA data point number	Author(s)	Year	Title	Source
CA 8.3.2	Xu H., Xue, M., Zhao, H., Ma, X., Liu, Y., Xu, H.Q., Xue, M., Zhao, H.P., Ma, X.D., Liu, Y.Y.	2013	Analysis and evaluation of eight herbicides toxicity and sensitivity against two *Trichogramma* spp.	Journal of Food, Agriculture & Environment (2013), Volume 11, Number 3/4, pp. 855-858, 19 refs. ISSN: 1459-0255
CA 8.3.2	Lim, U.T., Mahmoud, A.M.A.	2007	Pesticide susceptibility of *Trissolcus nigripedius* (Hymenoptera:Scelionidae) an egg parasitoid of *Dolycoris baccarum* (Heteroptera:Pentatomidae)	Entomological Research, (AUG 2007) Vol. 37, No. Suppl. 1, pp. A140. Meeting Info.: International Congress of Insect Biotechnology and Industry. Daegu, SOUTH KOREA. August 19-24, 2007. ISSN: 1738-2297.
CA 8.3.2	Griggs, J.L., Belden, L.K.	2005	Decreased survival of trematode cercariae *Echinostoma trivolvis* following atrazine and metolachlor exposure.	Integrative and Comparative Biology, (DEC 2005) Vol. 45, No. 6, pp. 1140. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative-Biology. Orlando, FL, USA. January 04-08, 2006. ISSN: 1540-7063.
CA 8.3.2	You, W.-Y., Chen, X.-F., Song, M., Wang, C.-J.	2010	Toxicity Evaluation of Sixteen Herbicides to *Bombyx mori*.	Asian Journal of Ecotoxicology, (FEB 2010) Vol. 5, No. 1, pp. 91-94. ISSN: 1673-5897.
CA 8.3.2	Liu, H.-J., Zhan, X.-M., Liu, W.	2005	Ecotoxicological difference of chiral pesticides: effects of metolachlor and S-metolachlor on some enzyme activities of silkworm, *Bombyx mori* L.	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 497-500. CODEN: PEACF2; ISSN: 1524-6434
CA 8.4	Park, E.-K., Lees, E.M.	2005	Application of an artificial sea salt solution to determine acute toxicity of herbicides to *Proisotoma minuta* (Collembola).	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2005) Vol. 40, No. 4, pp. 595-604. Journal code: 7607167. ISSN: 0360-1234. L-ISSN: 0360-1234.
CA 8.4	Wang, Y., Wu, S., Chen, L., Wu, C., Yu, R., Wang, Q., Zhao, X.	2012	Toxicity assessment of 45 pesticides to the epigeic earthworm *Eisenia fetida*.	Chemosphere, (July 2012) Vol. 88, No. 4, pp. 484-491. Refs: 63. ISSN: 0045-6535; E-ISSN: 1879-1298. CODEN: CMSHAF
CA 8.4	Xu, D., Wen, Y., Wang, K.	2010	Effect of chiral differences of metolachlor and its (S)-isomer on their toxicity to earthworms.	Ecotoxicology and environmental safety, (2010 Nov) Vol. 73, No. 8, pp. 1925-31. Journal code: 7805381. E-ISSN: 1090-2414. L-ISSN: 0147-6513.
CA 8.4	Stepic, S., Hackenberger, B.K., Velki, M., Hackenberger, D.K., Loncaric, Z.	2013	Potentiation effect of metolachlor on toxicity of organochlorine and organophosphate insecticides in earthworm *Eisenia andrei*.	Bulletin of environmental contamination and toxicology, (2013 Jul) Vol. 91, No. 1, pp. 55-61. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.
CA 8.4	Kamionek, M., Jarmul, J., Pezowicz, E.	2005	Effect of herbicides on *Enchytraeus* sp. (Annelida: Oligochaeta)	Ecological Chemistry and Engineering (2005), 12 (8), 811-816. CODEN: ECECBJ

CA data point number	Author(s)	Year	Title	Source
CA 8.4	Kamionek, M., Pezowicz, E., Jarmul, J., Poleszczuk, O.	2005	Effect of herbicides on earthworms *Lumbricus terrestris* L. (Oligochaeta: Lumbricidae)	Ecological Chemistry and Engineering (2005), 12 (10), 1089-1094. CODEN: ECECBJ
CA 8.4 CA 8.6	Kondras, M., Czepinska-Kaminska, D., Karczewska, J., Wojewoda, K.	2011	The influence of two pesticides in soils on selected plants and earthworms	Roczniki Gleboznawcze (2011), 62 (2), 219-225. CODEN: ROGLAA; ISSN: 0080-3642
CA 8.4	Aly, M.A.S., Schroder, P.	2008	Effect of herbicides on glutathione S-transferases in the earthworm, *Eisenia fetida*.	Environmental science and pollution research international, (2008 Mar) Vol. 15, No. 2, pp. 143-9. Journal code: 9441769. ISSN: 0944-1344.
CA 8.4.1	Iordache, M., Borza, I.	2011	Study of the acute toxicity of some Pesticides on earthworms *Eisenia fetida* (Savigny, 1826).	Research Journal of agricultural science, 43(4), pp. 95-100, 15 refs. ISSN: 2066-1843.
CA 8.4.1	Xu, D.-M., Xu, X.-L., Liu, W.-L., Liu, W.-P.	2009	Acute toxicity difference of metolachlor and its S-isomer on earthworms	Zhongguo Huanjing Kexue (2009), 29 (9), 1000-1004. CODEN: ZHKEEI; ISSN: 1000-6923
CA 8.4.1	Wang, Y., Yu, W., Yang, L., Cang, T., Yu R., Wang, Q., Zhao, X.	2012	Acute Toxicity of Twenty-Two Commonly Used Herbicides to Earthworm (*Eisenia fetida*).	Asian Journal of Ecotoxicology, (JUN 2012) Vol. 7, No. 3, pp. 317-325. ISSN: 1673-5897.
CA 8.4.1	Liu, W., Xu, D., Liu, H., Liu, G.	2007	Effects of metolachlor on the weight and enzyme activities of earthworms	Huanjing Kexue Xuebao (2007), 27 (12), 2025-2031. CODEN: HKXUDL; ISSN: 0253-2468
CA 8.5	Ayansina, A.D.V., Oso, B.A.	2006	Effect of two commonly used herbicides on soil microflora at two different concentrations.	African Journal of Biotechnology (2006) Volume 5, Number 2, pp. 129-132, 10 refs. ISSN: 1684-5615
CA 8.5	Joly, P., Besse-Hoggan, P., Bonnemoy, F., Batisson, I., Bohatier, J., Mallet, C.	2012	Impact of maize formulated herbicides Mesotrione and S-metolachlor, applied alone and in mixture, on soil microbial communities	ISRN Ecology, (2012) pp. 329898, 9 pp. CODEN: IESCCC. ISSN: 2090-4614.
CA 8.5	Joly, P., Bonnemoy, F., Charvy, J.-C., Bohatier, J., Mallet, C.	2013	Toxicity assessment of the maize herbicides S-metolachlor, benoxacor, mesotrione and nicosulfuron, and their corresponding commercial formulations, alone and in mixtures, using the Microtox(®) test.	Chemosphere, (2013 Nov) Vol. 93, No. 10, pp. 2444-50. Electronic Publication Date: 26 Sep 2013. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.
CA 8.5	Joly, P., Misson, B., Perriere, F. Bonneymoy, F. Joly, M. Bernard, F., Aguer, J-P., Bohatier, J., Mallet, C., Donnadieu-	2014	Soil surface colonisation by phototrophic indigenous organisms, in two contrasted soils treated by formulated maize herbicide mixtures	Ecotoxicology (London, England) (2014 Aug 18). Journal code 9885956. E-ISSN:1573-3017. L-ISSN: 0963-9292
CA 8.5	Lipsa, F.D., Ulea, E., Chiriac, I.P., Coroi, I.G.	2010	Effect of herbicide S-metolachlor on soil microorganisms.	Lucrari Stiintifice, Universitatea de Stiinte Agricole Si Medicina Veterinara "Ion Ionescu de la Brad" Iasi, Seria Agronomie (2010) Volume 53, Number 2, pp. 110-113, 11 refs. ISSN: 1454-7414

CA data point number	Author(s)	Year	Title	Source
CA 8.5	Vodovnik, M., Bistan, M., Zorec, M., Marinsek-Logar, R.	2012	Membrane Changes Associated with Exposure of *Pseudomonas putida* to Selected Environmental Pollutants and their Possible Roles in Toxicity.	Acta chimica Slovenica, (2012 Mar) Vol. 59, No. 1, pp. 83-8. Journal code: 101247110. ISSN: 1318-0207. L-ISSN: 1318-0207.
CA 8.5	Kos, K., Celar, F.A.	2013	Sensitivity of the entomopathogenic fungus *Beauveria bassiana* (Bals.-Criv.) Vuill. to selected herbicides.	Pest Management Science (2013), Volume 69, Number 6, pp. 717-721, 34 refs. ISSN: 1526-498X
CA 8.5	Zhao , S., Arthur, E.L., Moorman, T.B., Coats, J.R.	2005	Evaluation of microbial inoculation and vegetation to enhance the dissipation of atrazine and metolachlor in soil.	Environmental toxicology and chemistry / SETAC, (2005 Oct) Vol. 24, No. 10, pp. 2428-34. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.
CA 8.5	Chen, Bo., Xu, D., Wu, J., Liu, G., Liu, W.	2006	Effect of metolachlor on soil microbial numbers in rhizosphere and its degradation	Nongye Huanjing Kexue Xuebao (2006), 25 (4), 898-902. CODEN: NHKXA7; ISSN: 1672-2043
CA 8.5	Liu, H, Zhan, X., Liu, W., Liu, H.J., Zhan, X.M., Liu, W.P.	2006	Effect of Rac-metolachlor and S-isomer on soil microbial biomass carbon and nitrogen.	Acta Pedologica Sinica (2006) Volume 43, Number 5, pp. 875-878, 11 refs. ISSN: 0564-3929
CA 8.5	Martins, P.F., Carvalho, G., Gratao, P.L., Dourado, M.N., Pileggi, M., Araujo, W.L., Azevedo, R.A.	2011	Effects of the herbicides acetochlor and metolachlor on antioxidant enzymes in soil bacteria	Process Biochemistry, Vol. 46, no. 5, pp. 1186-1195, May 2011. ISSN: 1359-5113.
CA 8.5	Martins, P.F., Martinez, C.O., Carvalho, G.de., Carneiro, P.I.B., Azevedo, R.A., Pileggi, S.A.V., Melo, I.S.de., Pileggi, M., de Carvalho, G., de Melo, I.S.	2007	Selection of microorganisms degrading S-metolachlor herbicide.	Brazilian Archives of Biology and Technology (2007) Volume 50, Number 1, pp. 153-159, 27 refs. ISSN: 1516-8913
CA 8.5	Zhou, Y., Liu, W., Wang, T.	2005	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols of Southern China. I. Catalase activity.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2005 May) Vol. 16, No. 5, pp. 895-8. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.
CA 8.5	Zhou, Y., Liu, W., Ye, H.	2006	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols. II. Soil respiration.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2006 Jul) Vol. 17, No. 7, pp. 1305-9. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.
CA 8.5	Hou, Y., Xu, J.-Q., Meng, X.-L., Zhang, K., Yang, G.-F.	2013	Effects of nine herbicides on mycelial growth of *Rhizoctonia cerealis*	Mailei Zuowu Xuebao (2013), 33 (6), 1289-1293. CODEN: MZXAAG; ISSN: 1009-1041

CA data point number	Author(s)	Year	Title	Source
CA 8.6	Sikkema, P.H., Shropshire, C., Soltani, N.	2009	Response of dry bean to pre-plant incorporated and pre-emergence applications of S-metolachlor and fomesafen	Crop protection (2009), Volume 28, Number 9, pp. 744-748. ISSN: 0261-2194
CA 8.6	Samtani, J.B., Masiunas, J.B., Applyby, J.E.	2010	White Oak and Northern Red Oak Leaf Injury from Exposure to Chloroacetanilide Herbicides.	HortScience : a publication of the American Society for Horticultural Science (2010), Volume 45, Number 4, pp. 696-700. ISSN: 0018-5345
CA 8.6	Sikkema, P.H., Soltani, N., Shropshire, C., Robinson, D.E.	2006	Response of adzuki bean to pre-emergence herbicides.	Canadian journal of plant science = Revue Canadienne de phytotechnie (2006), Volume 86, Number 2, pp. 601-604. ISSN: 0008-4220
CA 8.6	Boutin, C., Elmegaard, N., Kjaer, C.	2004	Toxicity testing of fifteen non-crop plant species with six herbicides in a greenhouse experiment: Implications for risk assessment.	Ecotoxicology, (May 2004) Vol. 13, No. 4, pp. 349-369. ISSN: 0963-9292.
CA 8.6	Bollman, S.L., Sprague, C.L.	2008	Tolerance of 12 Sugarbeet Varieties to Applications of S-metolachlor and Dimethenamid-P	Weed technology (2008), Volume 22, Number 4, pp. 699-706. ISSN: 0890-037X Source Note: 2008 Oct., v. 22, no. 4
CA 8.6	Xie, F., Liu, H.J., Cai, W.D., Xie, F.	2010	Enantioselectivity of racemic metolachlor and S-metolachlor in maize seedlings	Journal of Environmental Science and Health. Part B, Pesticides, Food Contaminants, and Agricultural Wastes (2010), Volume 45, Number 8, pp. 774-782, 33 refs. ISSN: 0360-1234
CA 8.6	Samtani, J.B., Masiunas, J.B., Appleby, J.E.	2008	Injury on white oak seedlings from herbicide exposure simulating drift.	HortScience (2008), Vol. 43, Number 7, pp. 2076-2080, 27 refs. ISSN: 0018-5345
CA 8.6	Yadav, P.K., Khan, A.H., Amar, N., Yadav, S.K.S., Nath, A.	2007	Effect of herbicides on biochemical and growth parameters of chickpea (*Cicer arietinum* L.).	Research on Crops (2007), Vol. 8, Number 2, pp. 388-390, 8 refs. ISSN: 0972-3226
CA 8.6	Yadav, P.K., Khan, A.H., Murti, R., Upadhyay, R.K.	2006	Effect of herbicides on germination, growth and nodulation in chickpea (*Cicer arietinum*)	Indian Journal of Agricultural Sciences (2006), 76 (11), 682-684
CA 8.6	Norsworthy, J.K., Smith, J.P., Meister, C.	2007	Tolerance of direct-seeded green onions to herbicides applied before or after crop emergence.	Weed Technology (2007), Volume 21, Number 1, pp. 119-123. ISSN: 0890-037X
CA 8.6	Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	White bean sensitivity to preemergence herbicides.	Weed Technology (2004), Vol. 18, Number 3, pp. 675-679, 15 refs. ISSN: 0890-037X
CA 8.6	Neugebauerova, J., Petrikova, K.	2004	Possibilities of pre-emergence and post-emergence herbicide applications in *Prunella vulgaris* L. growth.	Zahradnictvi (Horticultural Science) (2004), Volume 31, Number 3, pp. 115-118, 13 refs. ISSN: 0862-867X
CA 8.6	Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	Tolerance of black beans (*Phaseolus vulgaris*) to soil applications of S-metolachlor and imazethapyr.	Weed Technology (2004), Volume 18, Number 1, pp. 111-118, 25 refs. ISSN: 0890-037X
CA 8.6	De Marez, T., Mechant, E., Goossens, V., Bulcke, R.	2007	Effect of selected sugar beet herbicides on germination of various *Chenopodium album* populations.	Communications in agricultural and applied biological sciences, (2007) Vol. 72, No. 2, pp. 265-9. Journal code: 101200320. ISSN: 1379-1176. L-ISSN: 1379-1176.

CA data point number	Author(s)	Year	Title	Source
CA 8.6	Moore, M. T., Krger, R.	2010	Effect of three insecticides and two herbicides on rice (*Oryza sativa*) seedling germination and growth.	Archives of Environmental Contamination and Toxicology (2010) Volume 59, Number 4, pp. 574-581, 53 refs. ISSN: 0090-4341
CA 8.6	Geier, P.W., Stahlman, P.W., Regehr, D.L., Olson, B.L.	2009	Pre-emergence Herbicide Efficacy and Phytotoxicity in Grain Sorghum	Weed technology (2009), Volume 23, Number 2, pp. 197-201. ISSN: 0890-037X
CA 8.6	Whaley, C.M., Armel, G.R., Wilson, H.P., Hines, T.E.	2009	Evaluation of S-Metolachlor and S-Metolachlor Plus Atrazine Mixtures with Mesotrione for Broadleaf Weed Control in Corn	Weed technology (2009), Volume 23, Number 2, pp. 193-196. ISSN: 0890-037X
CA 8.6	Bollman, S.L.,; Sprague, . L.	2007	Response of four commercial sugar beet varieties to s-metolachlor and dimethenamid-P.	Proceedings from the biennial meeting (2007), Number 34, 108 p.
CA 8.6	Swanton, C.J., Gulden, R.H., Chandler, K.	2007	A Rationale for Atrazine Stewardship in Corn	Weed science (2007), Volume 55, Number 1, pp. 75-81. ISSN: 0043-1745
CA 8.6	Guza, C.J., Stewart, J.F., Hubbell, L.A.	2007	*Beta vulgaris* response to amide herbicides.	Proceedings from the ... biennial meeting (2007), Number 34, 60 p.
CA 8.6	Chindo, P.S., Shebayan, J.A.Y., Marley, P.S.	2010	Effect of pre-emergence herbicides on *Meloidogyne* spp. and *Fusarium* wilt of tomato in Samaru, Zaria, Nigeria.	Journal of Agricultural Research (Lahore) (2010), Volume 48, Number 4, pp. 489-495, 20 refs. ISSN: 0368-1157
CA 8.6	Moore, J.H., Ryder, A., Master, R., Editor(s): Zydenbos, S.M.	2010	Herbicide tolerance of five young perennial grasses.	17th Australasian weeds conference. New frontiers in New Zealand: together we can beat the weeds. Christchurch, New Zealand, 26-30 September, 2010 (2010), pp. 402-405, 3 refs.
CA 8.6	Nagy, L. Editor(s): David, I., Koevics, G.J.	2008	Morphological changes of bird seed (*Phalaris canariensis* L.) by the pre-post herbicides treatments.	13. Tiszantuli Noevenyvedelmi Forum, 15-16 October 2008, Debrecen, Hungary (2008), pp. 175-179, 7 refs.
CA 8.6	Rankova, Z.	2006	Effect of some soil herbicides on the vegetative habits of walnut seedlings (*Juglans regia* L	Acta Agriculturae Serbica (2006), Volume 22, pp. 63-68, 6 refs. ISSN: 0354-9542
CA 8.6	Soltani, N., Bowley, S., Sikkema, P.H.	2005	Responses of black and cranberry beans (Phaseolus vulgaris) to post-emergence herbicides	CROP PROTECTION, (JAN 2005) Vol. 24, No. 1, pp. 15-21. ISSN: 0261-2194.

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

Author(s)	Year	CA data point number	Title	Source
Aly, M.A.S., Schroder, P.	2008	CA 8.4	Effect of herbicides on glutathione S-transferases in the earthworm, *Eisenia fetida*.	Environmental science and pollution research international, (2008 Mar) Vol. 15, No. 2, pp. 143-9. Journal code: 9441769. ISSN: 0944-1344.

Author(s)	Year	CA data point number	Title	Source
Auby, I; Bocquene, G; Quiniou, F; Dreno, J.P.	2007	CA 8.2.5.2	Arcachon basin 's weedkillers and insecticides contamination analysis (2005-2006 period) environmental impact.	Plouzane (France). 2007. Published by: Plouzane (France)
Ayansina, A.D.V., Muhammad, R.G.	2014	CA 8.2	An evaluation of the effect of four herbicides on some aquatic organisms.	International Journal of Biological and Chemical Sciences (2014), Volume 8, Number 1, pp. 304-313, 23 refs. ISSN: 1991-8631
Ayansina, A.D.V., Oso, B.A.	2006	CA 8.5	Effect of two commonly used herbicides on soil microflora at two different concentrations.	African Journal of Biotechnology (2006) Volume 5, Number 2, pp. 129-132, 10 refs. ISSN: 1684-5615
Babatunde, M.M., Balogun, J.K., Auta, J., Balarabe, M.L., Auta, J., Balogun, J.K., Bolorunduro, P.I., Editor(s): Onimisi, H.U.	2009	CA 8.2.1	Acute toxicity of galex to *Oreocromis niloticus* (Trewavas) in Nigeria	Proceedings of the 23rd annual conference of the Fisheries Society of Nigeria. pp. 159-164. 2009. Conference: 23rd annual conference of the fisheries Society of Nigeria (FISON), Kaduna (Nigeria), 26-30 Oct 2008
Belanger, R.M., Sabhapathy, G.S., Khan, S.	2014	CA 8.2.5.2	Atrazine and metolachlor exposure affects the chemosensory responses of male crayfish (*Orconectes rusticus*) to female odors.	Integrative and Comparative Biology, (2014) Vol. 54, No. Suppl. 1, pp. E15. http://icb.oxfordjournals.org/. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative- Biology. Austin, TX, USA. Jan. 03-07, 2014. ISSN: 1540-7063. E-ISSN: 1557-7023.
Berube, V.E., Boily, M.H, DeBlois, C., Dassylva, N., Spear, P.A.	2005	CA 8.2	Plasma retinoid profile in bullfrogs, *Rana catesbeiana*, in relation to agricultural intensity of sub-watersheds in the Yamaska River drainage basin, Quebec, Canada.	Aquatic toxicology (Amsterdam, Netherlands), (2005 Jan 26) Vol. 71, No. 2, pp. 109-20. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.
Birchfield, N., Corbin, M., Doelling-Brown, P., Hurley, P.	2006	CA 8.2.5.2	Risk Assessment of Racemic Metolachlor use to 26 Evolutionarily Significant Units of Endangered and Threatened Pacific Salmon and Steelhead	Conference: 27th Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), Montreal, Quebec (Canada), 3 Nov 2006 - 9 Nov 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)
Bollman, S.L.,; Sprague, . L.	2007	CA 8.6	Response of four commercial sugar beet varieties to s-metolachlor and dimethenamid-P.	Proceedings from the biennial meeting (2007), Number 34, 108 p.
Bollman, S.L., Sprague, C.L.	2008	CA 8.6	Tolerance of 12 Sugarbeet Varieties to Applications of s-Metolachlor and Dimethenamid-P	Weed technology (2008), Volume 22, Number 4, pp. 699-706. ISSN: 0890-037X Source Note: 2008 Oct., v. 22, no. 4
Boutin, C., Elmegaard, N., Kjaer, C.	2004	CA 8.6	Toxicity testing of fifteen non-crop plant species with six herbicides in a greenhouse experiment: Implications for risk assessment.	Ecotoxicology, (May 2004) Vol. 13, No. 4, pp. 349-369. ISSN: 0963-9292.

Author(s)	Year	CA data point number	Title	Source
Brain, R.A., Hoberg, J. Hosmer, A.J., Wall, S.B.	2012	CA 8.2.7	Influence of light intensity on the toxicity of atrazine to the submerged freshwater aquatic macrophyte *Elodea canadensis*	Ecotoxicology and Environmental Safety, (1 May 2012) Vol. 79, pp. 55-61. ISSN: 0147-6513.
Buckler, D.R., Mayer, F.L., Ellersieck, M.R., Asfaw, A.	2005	CA 8.2.1	Acute Toxicity Value Extrapolation with Fish and Aquatic Invertebrates	Archives of Environmental Contamination and Toxicology (2005), 49 (4), 546-558. CODEN: AECTCV; ISSN: 0090-4341
Cai, W,-D., Liu H.-J., Fang Z.-G.	2012	CA 8.2.6.1	Toxicity effects of Rac- and S-metolachlor on two algaes.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2012 Feb) Vol. 33, No. 2, pp. 448-53. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.
Caquet Th., Roucaute M; Mazzella N; Delmas F; Madigou C; Farcy E; Burgeot Th; Allenou J-P; Gabellec R	2013	CA 8.2	Risk assessment of herbicides and booster biocides along estuarine continuums in the Bay of Vilaine area (Brittany, France).	Environmental science and pollution research international, (2013 Feb) Vol. 20, No. 2, pp. 651-66. Electronic Publication Date: 16 Sep 2012 Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.
Carmo, E.L., Bueno, A.F., Bueno, R.C.O.F.	2010	CA 8.3.2	Pesticide selectivity for the insect egg parasitoid *Telenomus remus*.	BioControl (2010) Volume 55, Number 4, pp. 455-464, 38 refs. ISSN: 1386-6141
Cedergreen N., Spliid, N.H., Streibig, J.C.	2004	CA 8.2.7 CA 8.6	Species-specific sensitivity of aquatic macrophytes towards two herbicide	Ecotoxicology and Environmental Safety, (Jul 2004) Vol. 58, No. 3, pp. 314-323. ISSN: 0147-6513.
Chalifour, A., Spear, P.A., Boily, M.H., DeBlois, C., Giroux, I., Dassylva, N., Juneau, P.	2009	CA 8.2.6.1	Assessment of toxic effects of pesticide extracts on different green algal species by using chlorophyll a fluorescence	Toxicological and Environmental Chemistry (2009), 91 (7), 1315-1329. CODEN: TECSDY; ISSN: 0277-2248
Chen, Bo., Xu, D., Wu, J., Liu, G., Liu, W.	2006	CA 8.5	Effect of metolachlor on soil microbial numbers in rhizosphere and its degradation	Nongye Huanjing Kexue Xuebao (2006), 25 (4), 898-902. CODEN: NHKXA7; ISSN: 1672-2043
Chindo, P.S., Shebayan, J.A.Y., Marley, P.S.	2010	CA 8.6	Effect of pre-emergence herbicides on *Meloidogyne* spp. and *Fusarium* wilt of tomato in Samaru, Zaria, Nigeria.	Journal of Agricultural Research (Lahore) (2010), Volume 48, Number 4, pp. 489-495, 20 refs. ISSN: 0368-1157
Collin, H., Meistertzheim, A.-L., David, E., Moraga, D., Boutet, I.	2010	CA 8.2.5.2	Response of the Pacific oyster *Crassostrea gigas*, Thunberg 1793, to pesticide exposure under experimental conditions.	The Journal of experimental biology, (2010 Dec 1) Vol. 213, No. Pt 23, pp. 4010-7. Journal code: 0243705. E-ISSN: 1477-9145. L-ISSN: 0022-0949.
Cook, M.E., Moore, P.A.	2008	CA 8.2.5.2	The effects of the herbicide metolachlor on agonistic behavior in the crayfish, *Orconectes rusticus*.	Archives of environmental contamination and toxicology, (2008 Jul) Vol. 55, No. 1, pp. 94-102. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.

Author(s)	Year	CA data point number	Title	Source
Debenest, T., Pinelli, E., Coste, M., Silvestre, J., Mazzella, N., Madigou, C., Delmas, F.	2009	CA 8.2.6.2	Sensitivity of freshwater periphytic diatoms to agricultural herbicides.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 4) Vol. 93, No. 1, pp. 11-7. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X
De Marez, T., Mechant, E., Goossens, V., Bulcke, R.	2007	CA 8.6	Effect of selected sugar beet herbicides on germination of various *Chenopodium album* populations.	Communications in agricultural and applied biological sciences, (2007) Vol. 72, No. 2, pp. 265-9. Journal code: 101200320. ISSN: 1379-1176. L-ISSN: 1379-1176.
Deng, L., Senseman, S.A., Gentry, T.J., Zuberer, D.A., Weiss, T.L., Devarenne, T.P., Camargo, E.R.	2012	CA 8.2.6.1	Effect of selected herbicides on growth and hydrocarbon content of *Botryococcus braunii* (Race B)	Industrial Crops and Products (2012), 39, 154-161. CODEN: ICRDEW; ISSN: 0926-6690
De Solla, S., Martin, P.	2010	CA 8.1.4	Relationship between pesticide properties and absorption in turtles eggs from treated soil.	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 64. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.
De Solla, S.R., Martin, P.A	2011	CA 8.1.4	Absorption of current use pesticides by snapping turtle (*Chelydra serpentina*) eggs in treated soil.	Chemosphere, (2011 Oct) Vol. 85, No. 5, pp. 820-5. Electronic Publication Date: 8 Sep 2011. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535
De Solla, S.R., Palonen K.E., Martin P.A.	2014	CA 8.1.4	Toxicity of pesticides associated with potatoe production, including soil fumigants, to snapping turtle eggs (*Cheludra serpentine*).	Environmental toxicology and chemistry/SETAC (2014 Jan) 33 (1): 102-106.
Dobsikova, R., Blahova, J., Modra, H., Skoric, M., Svobodova, Z.	2011	CA 8.2.1	The effect of acute exposure to herbicide Gardoprim Plus Gold 500 SC on haematological and biochemical indicators and histopathological changes in common carp (*Cyprinus carpio* L.).	Acta Veterinaria Brno (2011) Volume 80, Number 4, pp. 359-363, 14 refs. ISSN: 0001-7213. DOI: 10.2754/avb201180040359
Dussault, S., Fortier, M., Boily, M., Brousseau, P., Fournier, M.	2010	CA 8.2	Immune status of the bullfrog (*Rana catesbeiana*) exposed to agripesticides	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 66. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.
Ebenezer, V., Ki, J.-S.	2013	CA 8.2.6.1 CA 8.2.6.2	Quantification of toxic effects of the herbicide metolachlor on marine microalgae *Ditylum brightwellii* (Bacillariophyceae), *Prorocentrum minimum* (Dinophyceae), and *Tetraselmis suecica* (Chlorophyceae).	Journal of microbiology (Seoul, Korea), (2013 Feb) Vol. 51, No. 1, pp. 136-9. Journal code: 9703165. E-ISSN: 1976-3794. L-ISSN: 1225-8873.

Author(s)	Year	CA data point number	Title	Source
Fiori E., Pistocchi R.	2014	CA 8.2.6.2	*Skeletonema marinoi* (Bacillariophyceae) sensitivity to herbicides and effects of temperature increase on cellular responses to terbuthylazine exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 112-20. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X
Fischer, B. B.; Roffler, S.; Eggen, R. I. L.	2012	CA 8.2.6.1	Multiple stressor effects of predation by rotifers and herbicide pollution on different *Chlamydomonas* strains and potential impacts on population dynamics.	Environmental Toxicology and Chemistry (2012) Volume 31, Number 12, pp. 2832-2840, 43 refs. ISSN: 0730-7268. DOI: 10.1002/etc.2010
Fulton, B., Brain, R.A., Belden, J.B., Brooks, B.W.	2007	CA 8.2.7	Individual and Combined Effects of Triclosan and Metolachlor on *Lemna Gibba*	Conference: 2007 Summer Speciality Conference of the American Water Resources Association (AWRA 2007), Vail Cascade Resort, Vail, Colorado (USA), 25 Feb 2007 - 27 Feb 2007. Sponsor(s): American Water Resources Association
Fulton, B., Brain, R., Brooks, B.	2007	CA 8.2.7	Responses of *Lemna gibba* Exposed to an Equitoxic Mixture of Triclosan and Metolachlor Across a Range of Nitrogen and Phosphorous Ratios.	Conference: 28th Annual Meeting of the Society of Environmental Toxicology and Chemistry North America, Midwest Express Center, Milwaukee, Wisconsin (USA), 11 Nov 2007- 15 Nov 2007. Sponsor(s): The Society of Environmental Toxicology and Chemistry (SETAC)
Gagnaire, B., Burgeot, T., Geret, F., Thomas-Guyon, H., Renault, T., Editor(s): Feunteun, E., Miramand, P.	2006	CA 8.2.5.2	Effect of heavy metals and herbicides on immune capacities in Pacific oyster, *Crassostrea gigas*. 599/1308	Cahiers de Biologie Marine (2006) Volume 47, Number 1, pp. 105-107, 7 refs. ISSN: 0007-9723
Gagnaire, B., Gay, M., Huvet, A., Daniel, J-Y., Saulnier, D., Renault, T.	2007	CA 8.2.5.2	Combination of a pesticide exposure and a bacterial challenge: in vivo effects on immune response of Pacific oyster, *Crassostrea gigas* (Thunberg).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Aug 15) Vol. 84, No.1, pp. 92-102. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.
Gagnaire, B., Thomas-Guyon, H., Burgeot, Th., Renault, T.	2006	CA 8.2.5.2	Pollutant effects on Pacific oyster, *Crassostrea gigas* (Thunberg), hemocytes: Screening of 23 molecules using flow cytometry.	Cell Biology and Toxicology (2006), 22 (1), 1-14. CODEN: CBTOE2; ISSN: 0742-2091
Geier, P.W., Stahlman, P.W., Regehr, D.L., Olson, B.L.	2009	CA 8.6	Pre-emergence Herbicide Efficacy and Phytotoxicity in Grain Sorghum	Weed technology (2009), Volume 23, Number 2, pp. 197-201. ISSN: 0890-037X

Author(s)	Year	CA data point number	Title	Source
Genersch, E., von der Ohe, W., Kaatz, H., Schroeder, A., Otten, C., Buechler, R., Berg, S., Ritter, W., Muehlen, W., Gisder, S., Meixner, M., Liebig, G., Rosenkranz, P.	2010	CA 8.3.1	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	Apidologie (2010), 41 (3), 332-352. CODEN: APDGB5; ISSN: 0044-8435
Geret, F., Burgeot, T., Haure, J., Gagnaire, B., Renault, T., Communal, P.Y., Samain, J.F.	2011	CA 8.2.5.2	Effects of low-dose exposure to pesticide mixture on physiological responses of the pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2011 Oct 19). Electronic Publication Date: 19 Oct 2011. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.
Geret, F., Burgeot T., Haure J., Gagnaire B., Renault T., Communal P.Y., Samain, J.F.	2013	CA 8.2.5.2	Effects of low-dose exposure to pesticide mixture on physiological responses of the Pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2013 Dec) Vol. 28, No. 12, pp. 689-99. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.
Geret, F., Gagnaire, B., Menard, D., Renault, T., Le Roux, A., Haure, J., Bocquene, G., Burgeot, T.	2004	CA 8.2.5.2	Response of the pacific oyster *Crassostrea gigas* to pesticide exposition under experimental conditions.	Marine Environmental Research, (August 2004) Vol. 58, No. 2-5, pp. 312-313. Meeting Info.: 12th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 12). Safety Harbor, FL, USA. May 09-13, 2003. CODEN: MERSDW. ISSN: 0141-1136.
Gerhardt, A., Koster, M., Lang, F., Leib, V.	2012	CA 8.2.5.2	Active in situ biomonitoring of pesticide pulses using *Gammarus* spp. In small tributaries of lake Constance	Journal of Environmental Protection (2012), 3 (7), 573-583. ISSN: 2152-2197
Greenlee, A.R., Ellis, T.M., Berg, R.L.	2004	CA 8.1.2	Low-dose agrochemicals and lawn-care pesticides induce developmental toxicity in murine preimplantation embryos.	Environmental health perspectives, (2004 May) Vol. 112, No. 6, pp. 703-9. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1241965.
Griggs, J.L., Belden, L.K.	2005	CA 8.3.2	Decreased survival of trematode cercariae *Echinostoma trivolvis* following atrazine and metolachlor exposure.	Integrative and Comparative Biology, (DEC 2005) Vol. 45, No. 6, pp. 1140. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative-Biology. Orlando, FL, USA. January 04-08, 2006. ISSN: 1540-7063.

Author(s)	Year	CA data point number	Title	Source
Gutierrez, M.M.	2007	CA 8.2	Evidence of endocrine disruption in amphibians due to agricultural chemical exposure.	Dissertation Abstracts International. Vol. 69, no. 6. 2007. Dissertation Number: AAI3319626. ISSN: 0419-4217 Published by: University Microfilms International, P.O. Box 1764, Ann Arbor, MI, 48106, USA
Guy, M., Singh, L., Mineau, P.	2011	CA 8.2.5.2	Using field data to assess the effects of pesticides on crustacea in freshwater aquatic ecosystems and verifying the level of protection provided by water quality guidelines	Integrated Environmental Assessment and Management (2011), 7 (3), 426-436. CODEN: IEAMCK; ISSN: 1551-3777
Guza, C.J., Stewart, J.F., Hubbell, L.A.	2007	CA 8.6	*Beta vulgaris* response to amide herbicides.	Proceedings from the ... biennial meeting (2007), Number 34, 60 p.
Haluzova, I., Modra, H., Mikula, P., Svobodova, Z.	2009	CA 8.2.1	Subchronic exposure of the common carp (*Cyprinus carpio*) to four herbicide formulations: Effect on the haematological indice.	Toxicology Letters (Shannon), (SEP 13 2009) Vol. 189, No. Sp. Iss. SI, pp. S210. Meeting Info.: 46th Congress of the European-Societies-of-Toxicology. Dresden, GERMANY. September 13 -16, 2009. CODEN: TOLED5. ISSN: 0378-4274. DT Conference; (Meeting)
Hayes, T.B., Case, P., Chui, S., Chung D., Haeffele, C., Haston, K., Lee, M., Mai, V.P,., Marjuoa, Y., Parker, J., Tsui, M.	2006	CA 8.2	Pesticide mixtures, endocrine disruption, and amphibian declines: are we underestimating the impact?	Environmental health perspectives, (2006 Apr) Vol. 114 Suppl 1, pp. 40-50. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1874187.
Helmer, S.H., Kerbaol, A., Aras, P., Jumarie, C., Boily, M.	2014	CA 8.3.1	Effects of realistic doses of atrazine, metolachlor, and glyphosate on lipid peroxidation and diet-derived antioxidants in caged honey bees (*Apis mellifera*).	Environmental science and pollution research international, (2014 Apr 15) Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.
Hou, Y., Xu, J.-Q., Meng, X.-L., Zhang, K., Yang, G.-F.	2013	CA 8.5	Effects of nine herbicides on mycelial growth of *Rhizoctonia cerealis*	Mailei Zuowu Xuebao (2013), 33 (6), 1289-1293. CODEN: MZXAAG; ISSN: 1009-1041
Hu, X.-N., Zhang, S.-X., Chen, C.-D., Liu, H.-J,.	2014	CA 8.2.6.2	Influence of the coexistence of Zn2+ on the enantioselective toxicity of metolachlor to *Scenedesmus obliquus*.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2014 Jan) Vol. 35, No. 1, pp. 292-8. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.
Iordache, M., Borza, I.	2011	CA 8.4.1	Study of the acute toxicity of some Pesticides on earthworms *Eisenia fetida* (Savigny, 1826).	Research Journal of agricultural science, 43(4), pp. 95-100, 15 refs. ISSN: 2066-1843.
Ishihara, S., Horio, T., Kobara, Y., Yokoyama, A.	2006	CA 8.2.6.2	Evaluation of herbicide effects on micro algal cells by flow cytometric analysis	Zasso Kenkyu (2006), 51 (4), 239-248. CODEN: ZASKAN; ISSN: 0372-798X

Author(s)	Year	CA data point number	Title	Source
Jin, Y., Chen, R., Wang, L., Liu, J., Yang, Y., Zhou, C., Liu, W., Fu, Z	2011	CA 8.1.4	Effects of metolachlor on transcription of thyroid system-related genes in juvenile and adult Japanese medaka (Oryzias latipes)	General and Comparative Endocrinology, 170:487-493
Jin-Clark, Y., Anderson, T.D., Zhu, K.Y.	2008	CA 8.2.5.4	Effect of alachlor and metolachlor on toxicity of chlorpyrifos and major detoxification enzymes in the aquatic midge, *Chironomus tentans* (Diptera: Chironomidae).	Archives of environmental contamination and toxicology, (2008 May) Vol. 54, No. 4, pp. 645-52. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.
Joly, P., Besse-Hoggan, P., Bonnemoy, F., Batisson, I., Bohatier, J., Mallet, C.	2012	CA 8.5	Impact of maize formulated herbicides Mesotrione and S-metolachlor, applied alone and in mixture, on soil microbial communities	ISRN Ecology, (2012) pp. 329898, 9 pp. CODEN: IESCCC. ISSN: 2090-4614.
Joly, P., Bonnemoy, F., Charvy, J.-C., Bohatier, J., Mallet, C.	2013	CA 8.5	Toxicity assessment of the maize herbicides S-metolachlor, benoxacor, mesotrione and nicosulfuron, and their corresponding commercial formulations, alone and in mixtures, using the Microtox(®) test.	Chemosphere, (2013 Nov) Vol. 93, No. 10, pp. 2444-50. Electronic Publication Date: 26 Sep 2013. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.
Joly, P., Misson, B., Perriere, F. Bonneymoy, F. Joly, M. Bernard, F., Aguer, J-P., Bohatier, J., Mallet, C., Donnadieu-	2014	CA 8.5	Soil surface colonisation by phototrophic indigenous organisms, in two contrasted soils treated by formulated maize herbicide mixtures	Ecotoxicology (London, England) (2014 Aug 18). Journal code 9885956. E-ISSN:1573-3017. L-ISSN: 0963-9292
Kamionek, M., Jarmul, J., Pezowicz, E.	2005	CA 8.4	Effect of herbicides on *Enchytraeus* sp. (Annelida: Oligochaeta)	Ecological Chemistry and Engineering (2005), 12 (8), 811-816. CODEN: ECECBJ
Kamionek, M., Pezowicz, E., Jarmul, J., Poleszczuk, O.	2005	CA 8.4	Effect of herbicides on earthworms *Lumbricus terrestris* L. (Oligochaeta: Lumbricidae)	Ecological Chemistry and Engineering (2005), 12 (10), 1089-1094. CODEN: ECECBJ
Keseru, M., Juhasz, E., Szabo, R., Tavaszi, J., Varnagy, L.	2007	CA 8.1.1.3	Study of the individual toxicity of three pesticides in a teratogenicity test on birds. Harom noevenyvedo szer egyedi mereghatasanak vizsgalata madarteratologiai tesztben.	Noevenyvedelem (2007), Vol. 43, Number 3, pp. 113-119, 23 refs. ISSN: 0133-0829

Author(s)	Year	CA data point number	Title	Source
Kolpin, D.W., Hubbard, L.E.,. Blazer, V.S., Young, J.A., Iwanowicz, L.R., Gray, J.L., Foreman, W.T., Furlong, E.T., Zaugg, S.D., Sandstrom, M.W., Focazio, M.J., Alvarez, D.A., Speiran, G.K., Meyer, M.T., Barber, L.B.	2013	CA 8.2	Chemical contaminants in water and sediment near fish nesting sites in the Potomac River basin: Determining potential exposures to smallmouth bass (*Micropterus dolomieu*).	Science of the Total Environment, (5 Jan 2013) Vol. 443, pp. 700-716. Refs: 85. ISSN: 0048-9697; E-ISSN: 1879-1026 CODEN: STEVA8
Kondras, M., Czepinska-Kaminska, D., Karczewska, J., Wojewoda, K.	2011	CA 8.5 CA 8.6	The influence of two pesticides in soils on selected plants and earthworms	Roczniki Gleboznawcze (2011), 62 (2), 219-225. CODEN: ROGLAA; ISSN: 0080-3642
Kos, K., Celar, F.A.	2013	CA 8.5	Sensitivity of the entomopathogenic fungus *Beauveria bassiana* (Bals.-Criv.) Vuill. to selected herbicides.	Pest Management Science (2013), Volume 69, Number 6, pp. 717-721, 34 refs. ISSN: 1526-498X
Kyriakopoulou, K., Anastasiadou, P., Machera, K.	2009	CA 8.2.4.1 CA 8.2.6.1	Comparative Toxicities of Fungicide and Herbicide Formulations on Freshwater and Marine Species	Bulletin of Environmental Contamination and Toxicology (2009), 82 (3), 290-295. CODEN: BECTA6; ISSN: 0007-4861
Larras, F., Bouchez, A., Rimet, F., Montuelle, B.	2012	CA 8.2.6.1	Using bioassays and species sensitivity distributions to assess herbicide toxicity towards benthic diatoms.	PloS one, (2012) Vol. 7, No. 8, pp. e44458. Electronic Publication: 2012-08-30.
Larras, F., Montuelle, B., Bouchez, A.	2013	CA 8.2.6.1	Assessment of toxicity thresholds in aquatic environments: does benthic growth of diatoms affect their exposure and sensitivity to herbicides?	The Science of the total environment, (2013 Oct 1) Vol. 463-464, pp. 469-77. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697.
Lim, U.T., Mahmoud, A.M.A.	2007	CA 8.3.2	Pesticide susceptibility of *Trissolcus nigripedius* (Hymenoptera:Scelionidae) an egg parasitoid of *Dolycoris baccarum* (Heteroptera:Pentatomidae)	Entomological Research, (AUG 2007) Vol. 37, No. Suppl. 1, pp. A140. Meeting Info.: International Congress of Insect Biotechnology and Industry. Daegu, SOUTH KOREA. August 19-24, 2007. ISSN: 1738-2297.
Lipsa, F.D., Ulea, E., Chiriac, I.P., Coroi, I.G.	2010	CA 8.5	Effect of herbicide S-metolachlor on soil microorganisms.	Lucrari Stiintifice, Universitatea de Stiinte Agricole Si Medicina Veterinara "Ion Ionescu de la Brad" Iasi, Seria Agronomie (2010) Volume 53, Number 2, pp. 110-113, 11 refs. ISSN: 1454-7414

Author(s)	Year	CA data point number	Title	Source
Liu, H.J.	2006	CA 8.2.5.2	Ecotoxicological difference of Rac-Metolachlor and S-Metolachlor	Conference: 16th Europe Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), World Forum Convention Center, Hague (Netherlands (The)), 7 May 2006 - 11 May 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)
Liu, H.J., Cai, W.D., Huang, R.N., Xia, H.L., Wen, Y.Z.	2012	CA 8.2.6.1	Enantioselective toxicity of metolachlor to *Scenedesmus obliquus* in the presence of cyclodextrins.	Chirality, (2012 Feb) Vol. 24, No. 2, pp. 181-7. Electronic Publication: 2011-12-19. Journal code: 8914261. E-ISSN: 1520-636X. L-ISSN: 0899-0042.
Liu, H., Xiong, M.	2009	CA 8.2.6.1	Comparative toxicity of racemic metolachlor and S-metolachlor to *Chlorella pyrenoidosa*.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 28) Vol. 93, No. 2-3, pp. 100-6. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Liu, H.J., Ye, W.H., Zhan, X.M., Liu, W.P.	2006	CA 8.2.5.1	A comparative study of rac- and S-metolachlor toxicity to *Daphnia magna*	Ecotoxicology and Environmental Safety (2006) Volume 63, Number 3, pp. 451-455, 25 refs. ISSN: 0147-6513. DOI: 10.1016/j.ecoenv.2005.02.002
Liu, H.-J., Zhan, X.-M., Liu, W.	2005	CA 8.3.2	Ecotoxicological difference of chiral pesticides: effects of metolachlor and S-metolachlor on some enzyme activities of silkworm, *Bombyx mori* L.	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 497-500. CODEN: PEACF2; ISSN: 1524-6434
Liu, H, Zhan, X., Liu, W., Liu, H.J., Zhan, X.M., Liu, W.P.	2006	CA 8.5	Effect of Rac-metolachlor and S-isomer on soil microbial biomass carbon and nitrogen.	Acta Pedologica Sinica (2006) Volume 43, Number 5, pp. 875-878, 11 refs. ISSN: 0564-3929
Liu, H., Zhan, X., Ye, W., Liu, W.	2005	CA 8.2.5.1	Ecotoxicological difference of chiral pesticides: chronic toxicity of metolachlor and S-metolachlor to *Daphnia magna*	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 492-496. CODEN: PEACF2; ISSN: 1524-6434
Liu, W., Fang, Q., Ma, Y.	2005	CA 8.2.4.1 CA 8.2.5.1 CA 8.5	Selectivity in aquatic toxicity and biodegradation of the herbicide Metolachlor	Abstracts of Papers, 230th ACS National Meeting, Washington, DC, United States, Aug. 28-Sept. 1, 2005 (2005), AGRO-060. Publisher: American Chemical Society, Washington, D. C. CODEN: 69HFCL
Liu, W., Xu, D., Liu, H., Liu, G.	2007	CA 8.4.1	Effects of metolachlor on the weight and enzyme activities of earthworms	Huanjing Kexue Xuebao (2007), 27 (12), 2025-2031. CODEN: HKXUDL; ISSN: 0253-2468

Author(s)	Year	CA data point number	Title	Source
Lizotte, R.E., Knight, S.S., Bryant, C.T., Smith, S.	2009	CA 8.2.5.2	Agricultural Pesticides in Mississippi Delta Oxbow Lake Sediments During Autumn and Their Effects on *Hyalella azteca*.	Archives of Environmental Contamination and Toxicology, (OCT 2009) Vol.57, No. 3, pp. 495-503. CODEN: AECTCV. ISSN: 0090-4341.
Lizotte, R.E., Knight, S.S., Shields, F.D., Bryant, C.T.	2009	CA 8.2.5.2	Effects of an atrazine, metolachlor and fipronil mixture on *Hyalella azteca* (Saussure) in a modified backwater wetland.	Bulletin of environmental contamination and toxicology, (2009 Dec) Vol. 83, No. 6, pp. 836-40. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.
Lizotte, R.E., Shields, F.D., Testa, S.	2012	CA 8.2.5.2	Effects of a simulated agricultural runoff event on sediment toxicity in a managed backwater wetland	Water, air, and soil pollution (2012), Volume 223, Number 8, pp. 5375-5389. ISSN: 1573-2932
Lizotte, R., Testa, S., Locke, M., Martin. A, Steinriede, R.W.	2013	CA 8.2.5.2	Responses of phytoplankton and *Hyalella azteca* to agrichemical mixtures in a constructed wetland mesocosm.	Archives of environmental contamination and toxicology, (2013 Oct) Vol. 65, No. 3, pp. 474-85. Electronic Publication Date: 23 Jun 2013. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.
Loureiro, S., Perez, J.R., Soares, A.M.V.M.	2010	CA 8.2.5.2	Effects of atrazine, metolachlor and endosulfan on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23-27 May 2010
Mai, H., Cachot, J., Brune, J., Geffard, O., Belles, A., Budzinski, H., Morin, B.	2012	CA 8.2.5.2	Embryotoxic and genotoxic effects of heavy metals and pesticides on early life stages of Pacific oyster (*Crassostrea gigas*).	Marine pollution bulletin, (2012 Dec) Vol. 64, No. 12, pp. 2663-70. Journal code: 0260231. E-ISSN: 1879-3363. L-ISSN: 0025-326X.
Mai, H., Gonzalez, P., Pardon, P., Tapie, N., Budzinski, H., Cachot, J., Morin, B.	2014	CA 8.2.5.2	Comparative responses of sperm cells and embryos of Pacific oyster (*Crassostrea gigas*) to exposure to metolachlor and its degradation products.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 48-56. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Mai, H., Morin, B., Pardon P., Gonzalez P., Budzinski H., Cachot J.	2013	CA 8.2.5.2	Environmental concentrations of irgarol, diuron and S-metolachlor induce deleterious effects on gametes and embryos of the Pacific oyster, *Crassostrea gigas*.	Marine environmental research, (2013 Aug) Vol. 89, pp. 1-8. Journal code: 9882895. E-ISSN: 1879-0291. L-ISSN: 0141-1136.
Ma, J., Wang, S., Wang, P., Ma, L., Chen, X., Xu, R.	2006	CA 8.2.6.1	Toxicity assessment of 40 herbicides to the green alga *Raphidocelis subcapitata*	Ecotoxicology and Environmental Safety (2006), 63 (3), 456-462. CODEN: EESADV; ISSN: 0147-6513

Author(s)	Year	CA data point number	Title	Source
Martins, P.F., Carvalho, G., Gratao, P.L., Dourado, M.N., Pileggi, M., Araujo, W.L., Azevedo, R.A.	2011	CA 8.5	Effects of the herbicides acetochlor and metolachlor on antioxidant enzymes in soil bacteria	Process Biochemistry, Vol. 46, no. 5, pp. 1186-1195, May 2011. ISSN: 1359-5113.
Martins, P.F., Martinez, C.O., Carvalho, G.de., Carneiro, P.I.B., Azevedo, R.A., Pileggi, S.A.V., Melo, I.S.de., Pileggi, M., de Carvalho, G., de Melo, I.S.	2007	CA 8.5	Selection of microorganisms degrading S-metolachlor herbicide.	Brazilian Archives of Biology and Technology (2007) Volume 50, Number 1, pp. 153-159, 27 refs. ISSN: 1516-8913
McDaniel, T.V., Martin, P.A., Struger, J., Sherry, J., Marvin, C.H., McMaster, M.E., Clarence, S., Tetreault, G.	2008	CA 8.2	Potential endocrine disruption of sexual development in free ranging male northern leopard frogs (*Rana pipiens*) and green frogs (*Rana clamitans*) from areas of intensive row crop agriculture. [Erratum to document cited in CA149:301052]	Aquatic Toxicology (2008), 90 (1), 82. CODEN: AQTODG; ISSN: 0166-445X
Moore, J.H., Ryder, A., Master, R., Editor(s): Zydenbos, S.M.	2010	CA 8.6	Herbicide tolerance of five young perennial grasses.	17th Australasian weeds conference. New frontiers in New Zealand: together we can beat the weeds. Christchurch, New Zealand, 26-30 September, 2010 (2010), pp. 402-405, 3 refs.
Moore, M. T., Krger, R.	2010	CA 8.6	Effect of three insecticides and two herbicides on rice (*Oryza sativa*) seedling germination and growth.	Archives of Environmental Contamination and Toxicology (2010) Volume 59, Number 4, pp. 574-581, 53 refs. ISSN: 0090-4341
Moore, M.T. (Reprint Author), Lizotte, R.E., Cooper, C.M., Smith, S., Knight, S.S.	2004	CA 8.2.5.2	Survival and growth of *Hyalella azteca* exposed to three Mississippi Oxbow lake Sediments.	Bulletin of Environmental Contamination and Toxicology, (April 2004) Vol. 72, No. 4, pp. 777-783. ISSN: 0007-4861.
Nagy, L. Editor(s): David, I., Koevics, G.J.	2008	CA 8.6	Morphological changes of bird seed (*Phalaris canariensis* L.) by the pre-post herbicides treatments.	13. Tiszantuli Noevenyvedelmi Forum, 15-16 October 2008, Debrecen, Hungary (2008), pp. 175-179, 7 refs.
Neugebauerova, J., Petrikova, K.	2004	CA 8.6	Possibilities of pre-emergence and post-emergence herbicide applications in *Prunella vulgaris* L. growth.	Zahradnictvi (Horticultural Science) (2004), Volume 31, Number 3, pp. 115-118, 13 refs. ISSN: 0862-867X
Norsworthy, J.K., Smith, J.P., Meister, C.	2007	CA 8.6	Tolerance of direct-seeded green onions to herbicides applied before or after crop emergence.	Weed Technology (2007), Volume 21, Number 1, pp. 119-123. ISSN: 0890-037X

Author(s)	Year	CA data point number	Title	Source
Padilla, S., Corum, D., Padnos, B., Hunter, D. L., Beam, A.; Houck, K.A., Sipes, N., Kleinstreuer, N., Knudsen, T., Dix, D.J., Reif, D.M.	2012	CA 8.2.1	Zebrafish developmental screening of the ToxCast Phase I chemical library	Reproductive Toxicology (2012), 33 (2), 174-187. CODEN: REPTED; ISSN: 0890-6238
Papaefthimiou, C., Cabral, M. de G., Mixailidou, C., Viegas, C.A., Sa-Correia, I., Theophilidis, G.	2004	CA8.1.4 CA 8.5	Comparison of two screening bioassays, based on the frog sciatic nerve and yeast cells, for the assessment of herbicide toxicity.	Environmental toxicology and chemistry / SETAC, (2004 May) Vol. 23, No. 5, pp. 1211-8. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.
Papoulias, D.M. , Schwarz, M.S., Mena, L.	2013	CA 8.1.4	Gonadal abnormalities in frogs (*Lithobates* spp.) collected from managed wetlands in an agricultural region of Nebraska, USA.	Environmental Pollution, (January 2013) Vol. 172, pp. 1-8. Refs: 78. ISSN: 0269-7491; E-ISSN: 1873-6424; CODEN: ENPOEK
Park, E.-K., Lees, E.M.	2005	CA 8.3.2	Application of an artificial sea salt solution to determine acute toxicity of herbicides to *Proisotoma minuta* (Collembola).	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2005) Vol. 40, No. 4, pp. 595-604. Journal code: 7607167. ISSN: 0360-1234. L-ISSN: 0360-1234.
Passy, S.I., Bode, R.W., Carlson, D. M., Novak, M. A.	2004	CA 8.2.1 CA 8.2.4 CA 8.2.6	Comparative environmental assessment in the studies of benthic diatom, macroinvertebrate, and fish communities	International Review of Hydrobiology (2004), 89 (2), 121-138. ISSN: 1434-2944
Perez, J.R.	2011	CA 8.2.1	Effects of s-triazines and metolachlor on chlorpyrifos toxicity in Zebrafish (*Danio rerio*) early life-stages	Conference: 21st Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2011), Milano Convention Centre, Milan, 15 May 2011 - 19 May 2011
Perez, J., Domingues, I., Soares, A.M.V.M., Loureiro, S.	2011	CA 8.2.6.1	Growth rate of *Pseudokirchneriella subcapitata* exposed to herbicides found in surface waters in the Alqueva reservoir (Portugal): a bottom-up approach using binary mixtures.	Ecotoxicology (London, England), (2011 Aug) Vol. 20, No. 6, pp. 1167-75. Journal code: 9885956. E-ISSN: 1573-3017. L-ISSN: 0963-9292.
Perez, J.R., Loureiro, S.M., Soares, A.M.V.M.	2010	CA 8.2.5.2	Effects of atrazine and metolachlor on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23 May 2010-27 May 2010

Author(s)	Year	CA data point number	Title	Source
Perez, J., Monteiro, M.S., Quintaneiro C., Soares, A.M.V.M., Loureiro, S.	2013	CA 8.2.5.4	Characterization of cholinesterases in *Chironomus riparius* and the effects of three herbicides on chlorpyrifos toxicity.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Nov 15) Vol. 144-145, pp. 296-302. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Polard T., Jean, S., Gauthier, L., Laplanche, C., Merlina, G., Sanchez-Perez J.M., Pinelli, E.	2011	CA 8.2.1	Mutagenic impact on fish of runoff events in agricultural areas in south-west France.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Jan 17) Vol. 101, No. 1, pp. 126-34. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Praet, N. van; Bruyn, L. de; Jonge, M. de; Vanhaecke, L.; Stoks, R.; Bervoets, L.; van Praet, N.; de Bruyn, L.; de Jonge, M.	2014	CA 8.2.5.2	Can damsel fly larvae (*Ischnura elegans*) be used as bioindicators of sublethal effects of environmental contamination?	Aquatic Toxicology (2014), Volume 154, pp. 270-277. ISSN: 0166-445X
Rankova, Z.	2006	CA 8.6	Effect of some soil herbicides on the vegetative habits of walnut seedlings (*Juglans regia* L	Acta Agriculturae Serbica (2006), Volume 22, pp. 63-68, 6 refs. ISSN: 0354-9542
Rea, G., Polticelli, F., Antonacci, A., Scognamiglio, V., Katiyar, P., Kulkarni, S.A., Johanningmeier, U., Giardi, M.T.	2009	CA 8.2.6.2	Structure-based design of novel *Chlamydomonas reinhardtii* D1-D2 photosynthetic proteins for herbicide monitoring	Protein Science (2009), 18 (10), 2139-2151. CODEN: PRCIEI; ISSN: 1469-896X
Roubeix, V., Fauvelle, V., Tison-Rosebery, J., Mazzella, N., Coste M., Delmas F.	2012	CA 8.2.6.2	Assessing the impact of chloroacetanilide herbicides and their metabolites on periphyton in the Leyre River (SW France) via short term growth inhibition tests on autochthonous diatoms.	Journal of environmental monitoring : JEM, (2012 May) Vol. 14, No. 6, pp. 1655-63. Journal code: 100968688. E-ISSN: 1464-0333. L-ISSN: 1464-0325.
Roubeix, V., Mazzella, N., Mechin, B., Coste, M., Delmas, F.	2011	CA 8.2.6.2	Impact of the herbicide metolachlor on river periphytic diatoms: experimental comparison of descriptors at different biological organization levels.	Annales de Limnologie - International Journal of Limnology (2011) Volume 47, Number 3, pp. 239-249, 46 refs. ISSN: 0003-4088. DOI: 10.1051/limn/2011009
Samtani, J.B., Masiunas, J.B., Appleby, J.E.	2008	CA 8.6	Injury on white oak seedlings from herbicide exposure simulating drift.	HortScience (2008), Vol. 43, Number 7, pp. 2076-2080, 27 refs. ISSN: 0018-5345
Samtani, J.B., Masiunas, J.B., Applyby, J.E.	2010	CA 8.6	White Oak and Northern Red Oak Leaf Injury from Exposure to Chloroacetanilide Herbicides.	HortScience : a publication of the American Society for Horticultural Science (2010), Volume 45, Number 4, pp. 696-700. ISSN: 0018-5345
Sanchez-Bayo, F.	2006	CA 8.2.5.2	Comparative acute toxicity of organic pollutants and reference values for crustaceans. I. Branchiopoda, Copepoda and Ostracoda	Environmental Pollution (Amsterdam, Netherlands) (2006), 139 (3), 385-420 CODEN: ENPOEK; ISSN: 0269-7491

Author(s)	Year	CA data point number	Title	Source
Sangwan, M., Wei, L.	2008	CA 8.2.6.2	Effect of herbicide metolachlor on brown tide alga *Aureococcus anophagefferens* growth and detoxification.	Abstracts of Papers American Chemical Society, (AUG 17 2008) Vol. 236, pp. 122-ENVR. Meeting Info.: 236th National Meeting of the American-Chemical-Society. Philadelphia, PA, USA. August 17 -21, 2008. CODEN: ACSRAL. ISSN: 0065-7727.
Sbrilli, G., Bimbi, B., Cioni, F., Pagliai, L., Luchi, F., Lanciotti, E.	2005	CA 8.2.6.2	Surface and ground waters characterization in Tuscany (Italy) by using algal bioassay and pesticide determinations: comparative evaluation of the results and hazard assessment of the pesticides impact on primary productivity	Chemosphere (2005), 58 (5), 571-578. CODEN: CMSHAF; ISSN: 0045-6535
Shutler, D., Marcogliese, D.J.	2011	CA 8.2	Leukocyte profiles of Northern Leopard Frogs, *Lithobates pipiens*, exposed to pesticides and hematozoa in agricultural wetlands.	Copeia (2011), Number 2, pp. 301-307. ISSN: 0045-8511
Sikkema, P.H., Shropshire, C., Soltani, N.	2009	CA 8.6	Response of dry bean to pre-plant incorporated and pre-emergence applications of S-metolachlor and fomesafen	Crop protection (2009), Volume 28, Number 9, pp. 744-748. ISSN: 0261-2194
Sikkema, P.H., Soltani, N., Shropshire, C., Robinson, D.E.	2006	CA 8.6	Response of adzuki bean to pre-emergence herbicides.	Canadian journal of plant science = Revue Canadienne de phytotechnie (2006), Volume 86, Number 2, pp. 601-604. ISSN: 0008-4220
Smalling, K.L., Morgan, S., Kuivila, K.K.	2010	CA 8.2.5.2	Accumulation of current-use and organochlorine pesticides in crab embryos from northern California, USA	Environmental Toxicology and Chemistry (2010), 29 (11), 2593-2599. CODEN: ETOCDK; ISSN: 0730-7268
Solis, M.E., Liu, C.C., Nam, P., Niyogi, D.K., Bandeff, J.M., Huang, Y.-W.	2007	CA 8.2	Occurrence of organic chemicals in two rivers inhabited by Ozark hellbenders (*Cryptobranchus alleganiensis bishopi*)	Archives of Environmental Contamination and Toxicology (2007), 53 (3), 426-434. CODEN: AECTCV; ISSN: 0090-4341
Soltani, N., Bowley, S., Sikkema, P.H.	2005	CA 8.6	Responses of black and cranberry beans (Phaseolus vulgaris) to post-emergence herbicides	CROP PROTECTION, (JAN 2005) Vol. 24, No. 1, pp. 15-21. ISSN: 0261-2194.
Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	CA 8.6	White bean sensitivity to preemergence herbicides.	Weed Technology (2004), Vol. 18, Number 3, pp. 675-679, 15 refs. ISSN: 0890-037X
Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	CA 8.6	Tolerance of black beans (*Phaseolus vulgaris*) to soil applications of S-metolachlor and imazethapyr.	Weed Technology (2004), Volume 18, Number 1, pp. 111-118, 25 refs. ISSN: 0890-037X
Souissi Y., Bouchonnet, S; Bourcier, S; Kusk K. O.; Sablier M., Andersen H. R.	2013	CA 8.2.4.1	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water.	The Science of the total environment, (2013 Aug 1) Vol. 458-460, pp. 527-34. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697

Author(s)	Year	CA data point number	Title	Source
Spoljaric, D., Cipak, A., Horvatic, J., Andrisic, L., Waeg, G., Zarkovic, N., Jaganjac, M.	2011	CA8.2.6.2.	Endogenous 4-hydroxy-2-nonenal in microalga *Chlorella kessleri* acts as a bioactive indicator of pollution with common herbicides and growth regulating factor of hormesis.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Oct) Vol. 105, No. 3-4, pp. 552-8. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Spolyarich N., Hyne, R., Wilson S., Palmer C., Byrne M.	2010	CA 8.1.4	Growth, development and sex ratios of Spotted Marsh Frog (*Limnodynastes tasmaniensis*) larvae exposed to atrazine and a herbicide mixture.	Chemosphere, (2010 Feb) Vol. 78, No. 7, pp. 807-13. Electronic Publication Date: 30 Dec 2009. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.
Spolyarich N., Hyne R.V., Wilson S.P., Palmer C.G., Byrne M.	2011	CA 8.1.4	Morphological abnormalities in frogs from a rice-growing region in NSW, Australia, with investigations into pesticide exposure.	Environmental monitoring and assessment, (2011 Feb) Vol. 173, No. 1-4, pp.397-407. Journal code: 8508350. E-ISSN: 1573-2959. L-ISSN: 0167-6369.
Stepic, S., Hackenberger, B.K., Velki, M., Hackenberger, D.K., Loncaric, Z.	2013	CA 8.4	Potentiation effect of metolachlor on toxicity of organochlorine and organophosphate insecticides in earthworm *Eisenia andrei*.	Bulletin of environmental contamination and toxicology, (2013 Jul) Vol. 91, No. 1, pp. 55-61. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.
Swanton, C.J., Gulden, R.H., Chandler, K.	2007	CA 8.6	A Rationale for Atrazine Stewardship in Corn	Weed science (2007), Volume 55, Number 1, pp. 75-81. ISSN: 0043-1745
Thakkar, M., Randhawa, V., Wei, L.	2013	CA 8.2.6.1	Comparative responses of two species of marine phytoplankton to metolachlor exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Jan 15) Vol. 126, pp. 198-206. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.
Tierney, K.B., Sampson, J.L., Kennedy, C.J., Ross, P.S., Sekela, M.A., Kennedy, C. J.	2008	CA 8.2.1	Salmon olfaction is impaired by an environmentally realistic pesticide mixture.	Environmental Science and Technology, (1 Jul 2008) Vol. 42, No. 13, pp. 4996-5001. Refs: 26. ISSN: 0013-936X; CODEN: ESTHAG
Toropov, A.A., Benfenati, E.	2006	CA 8.2.5.2	QSAR models for *Daphnia* toxicity of pesticides based on combinations of topological parameters of molecular structures 417/559	Bioorganic & Medicinal Chemistry (2006), 14 (8), 2779-2788. CODEN: BMECEP; ISSN: 0968-0896
Ubachukwu, P.O., Oluah, N.S., Omeje, C.U., Ikele, C.B.	2012	CA 8.2.1	Effect of herbicide (Primextra) on tissue cholesterol level in *Clarias gariepinus* juvenile.	Animal Research International (2012), Volume 9, Number 1, pp. 1524-1528, 16 refs. ISSN: 159-3115
Vallotton, N., Moser, D., Eggen R.I.L., Junghans, M., Chevre, N.	2008	CA 8.2.6.1	S-metolachlor pulse exposure on the alga *Scenedesmus vacuolatus*: effects during exposure and the subsequent recovery.	Chemosphere, (2008 Sep) Vol. 73, No. 3, pp. 395-400. Electronic Publication: 2008-07-07. Journal code: 0320657. ISSN: 0045-6535. L-ISSN: 0045-6535.

Author(s)	Year	CA data point number	Title	Source
Varnagy, L., Budai, P., Fejes, S., Keseru, M., Szabo, R.. Juhasz, E.	2004	CA 8.1.1.3	Degredation dynamics and toxicity of certain pesticide active ingredients in bird embryos.	Magyar Allatorvosok Lapja (2004), Volume 126, Number 12, pp. 755-760, 21 refs. ISSN: 0025-004X
Vodovnik, M., Bistan, M., Zorec, M., Marinsek-Logar, R.	2012	CA 8.5	Membrane Changes Associated with Exposure of *Pseudomonas putida* to Selected Environmental Pollutants and their Possible Roles in Toxicity.	Acta chimica Slovenica, (2012 Mar) Vol. 59, No. 1, pp. 83-8. Journal code: 101247110. ISSN: 1318-0207. L-ISSN: 1318-0207.
Vogwill, T., Lagator, M., Colegrave, N., Neve, P.	2012	CA 8.2.6.1	The experimental evolution of herbicide resistance in *Chlamydomonas reinhardtii* results in a positive correlation between fitness in the presence and absence of herbicides	Journal of Evolutionary Biology (2012), 25 (10), 1955-1964. ISSN: 1010-061X
Wan, M. T., Buday, C., Schroeder, G., Kuo, J., Pasternak, J.	2006	CA 8.1.4 CA 8.2.1 CA 8.2.4.1 CA 8.2.4.2	Toxicity to *Daphnia magna*, *Hyalella azteca*, *Oncorhynchus kisutch*, *Oncorhynchus mykiss*, *Oncorhynchus tshawytscha* and *Rana catesbeiana* of atrazine, metolachlor, simazine, and their formulated products.	Bulletin of Environmental Contamination and Toxicology (2006) Volume 76, Number 1, pp. 52-58, 9 refs. ISSN: 0007-4861. DOI: 10.1007/s00128-005-0888-4
Wang, Y., Wu, S., Chen, L., Wu, C., Yu, R., Wang, Q., Zhao, X.	2012	CA 8.4	Toxicity assessment of 45 pesticides to the epigeic earthworm *Eisenia fetida*.	Chemosphere, (July 2012) Vol. 88, No. 4, pp. 484-491. Refs: 63. ISSN: 0045-6535; E-ISSN: 1879-1298. CODEN: CMSHAF
Wang, Y., Yu, W., Yang, L., Cang, T., Yu R., Wang, Q., Zhao, X.	2012	CA 8.4.1	Acute Toxicity of Twenty-Two Commonly Used Herbicides to Earthworm (*Eisenia fetida*).	Asian Journal of Ecotoxicology, (JUN 2012) Vol. 7, No. 3, pp. 317-325. ISSN: 1673-5897.
Whaley, C.M., Armel, G.R., Wilson, H.P., Hines, T.E.	2009	CA 8.6	Evaluation of S-Metolachlor and S-Metolachlor Plus Atrazine Mixtures with Mesotrione for Broadleaf Weed Control in Corn	Weed technology (2009), Volume 23, Number 2, pp. 193-196. ISSN: 0890-037X
Williams, B.K., Semlitsch, R.D.	2010	CA 8.1.4	Larval responses of three Midwestern anurans to chronic, low-dose exposures of four herbicides.	Arch. Environ. Contam. Toxicol. (2010) 58, 819-827.
Xie, F., Liu, H.J., Cai, W.D., Xie, F.	2010	CA 8.6	Enantioselectivity of racemic metolachlor and S-metolachlor in maize seedlings	Journal of Environmental Science and Health. Part B, Pesticides, Food Contaminants, and Agricultural Wastes (2010), Volume 45, Number 8, pp. 774-782, 33 refs. ISSN: 0360-1234
Xu, D., Wen, Y., Wang, K.	2010	CA 8.4	Effect of chiral differences of metolachlor and its (S)-isomer on their toxicity to earthworms.	Ecotoxicology and environmental safety, (2010 Nov) Vol. 73, No. 8, pp. 1925-31. Journal code: 7805381. E-ISSN: 1090-2414. L-ISSN: 0147-6513.
Xu, D.-M., Xu, X.-L., Liu, W.-L., Liu, W.-P.	2009	CA 8.4.1	Acute toxicity difference of metolachlor and its S-isomer on earthworms	Zhongguo Huanjing Kexue (2009), 29 (9), 1000-1004. CODEN: ZHKEEI; ISSN: 1000-6923

Author(s)	Year	CA data point number	Title	Source
Xu H., Xue, M., Zhao, H., Ma, X., Liu, Y., Xu, H.Q., Xue, M., Zhao, H.P., Ma, X.D., Liu, Y.Y.	2013	CA 8.3.2	Analysis and evaluation of eight herbicides toxicity and sensitivity against two *Trichogramma* spp.	Journal of Food, Agriculture & Environment (2013), Volume 11, Number 3/4, pp. 855-858, 19 refs. ISSN: 1459-0255
Yadav, P.K., Khan, A.H., Murti, R., Upadhyay, R.K.	2006	CA 8.6	Effect of herbicides on germination, growth and nodulation in chickpea (*Cicer arietinum*)	Indian Journal of Agricultural Sciences (2006), 76 (11), 682-684
Yadav, P.K., Khan, A.H., Amar, N., Yadav, S.K.S., Nath, A.	2007	CA 8.6	Effect of herbicides on biochemical and growth parameters of chickpea (*Cicer arietinum* L.).	Research on Crops (2007), Vol. 8, Number 2, pp. 388-390, 8 refs. ISSN: 0972-
Ye, J., Liu, J., Liu, W., Zhao, M., Liu, W.	2010	CA 8.0	Enantioselectivity in environmental risk assessment of modern chiral pesticides.	Environmental Pollution, (July 2010) Vol. 158, No. 7, pp. 2371-2383. Refs: 69. ISSN: 0269-7491 CODEN: ENPOEK
You, W.-Y., Chen, X.-F., Song, M., Wang, C.-J.	2010	CA 8.3.2	Toxicity Evaluation of Sixteen Herbicides to *Bombyx mori*.	Asian Journal of Ecotoxicology, (FEB 2010) Vol. 5, No. 1, pp. 91-94. ISSN: 1673-5897.
Zablotowicz, R.M., Locke, M.A., Lerch, R.N., Knight, S.S.	2004	CA 8.2.6.2	Dynamics of herbicide concentrations in Mississippi Delta Oxbow Lakes and the role of planktonic microorganisms in herbicide metabolism	ACS Symposium Series (2004), 877 (Water Quality Assessments in the Mississippi Delta), 134-149. CODEN: ACSMC8; ISSN: 0097-6156
Zhan, X., Liu, H., Miao, Y., Liu, W., Zhan, X.M., Liu, H.J., Miao, Y.G., Liu, W.P.	2006	CA 8.3.1	A comparative study of rac- and S-metolachlor on some activities and metabolism of silkworm, *Bombyx mori* L.	Pesticide Biochemistry and Physiology (2006) Volume 85, Number 3, pp. 133-138, 33 refs. ISSN: 0048-3575. DOI: 10.1016/j.pestbp.2005.12.003
Zhao , S., Arthur, E.L., Moorman, T.B., Coats, J.R.	2005	CA 8.5	Evaluation of microbial inoculation and vegetation to enhance the dissipation of atrazine and metolachlor in soil.	Environmental toxicology and chemistry / SETAC, (2005 Oct) Vol. 24, No. 10, pp. 2428-34. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.
Zhou, B., Zhao, M.-R., Huang, H.-F.	2008	CA 8.2.1	Study on zebrafish embryo-toxicity of four pesticides	Zhejiang Gongye Daxue Xuebao (2008), 36 (2), 136-140. ISSN: 1006-4303
Zhou, Y., Liu, W., Wang, T.	2005	CA 8.5	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols of Southern China. I. Catalase activity.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2005 May) Vol. 16, No. 5, pp. 895-8. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.

Author(s)	Year	CA data point number	Title	Source
Zhou, Y., Liu, W., Ye, H.	2006	CA 8.5	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols. II. Soil respiration.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2006 Jul) Vol. 17, No. 7, pp. 1305-9. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.

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

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

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.0	Ye, J., Liu, J., Liu, W., Zhao, M., Liu, W.	2010	Enantioselectivity in environmental risk assessment of modern chiral pesticides.	Environmental Pollution, (July 2010) Vol. 158, No. 7, pp. 2371-2383. Refs: 69. ISSN: 0269-7491 CODEN: ENPOEK	Not relevant. Review paper. No new data presented.
CA 8.1.1.3	Keseru, M., Juhasz, E., Szabo, R., Tavaszi, J., Varnagy, L.	2007	Study of the individual toxicity of three pesticides in a teratogenicity test on birds. Harom noevenyvedo szer egyedi mereghatasanak vizsgalata madarteratologiai tesztben.	Noevenyvedelem (2007), Vol. 43, Number 3, pp. 113-119, 23 refs. ISSN: 0133-0829	Does not fulfil criteria 6 (exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified). Embryos were either injected or immersed in Dual Gold. Not appropriate route of exposure.
CA 8.1.1.3	Varnagy, L., Budai, P., Fejes, S., Keseru, M., Szabo, R.. Juhasz, E.	2004	Degredation dynamics and toxicity of certain pesticide active ingredients in bird embryos.	Magyar Allatorvosok Lapja (2004), Volume 126, Number 12, pp. 755-760, 21 refs. ISSN: 0025-004X	Does not fulfil criteria 6 (exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified). Embryos were either injected or immersed in Dual Gold. Not appropriate route of exposure.
CA 8.1.2	Greenlee, A.R., Ellis, T.M., Berg, R.L.	2004	Low-dose agrochemicals and lawn-care pesticides induce developmental toxicity in murine preimplantation embryos.	Environmental health perspectives, (2004 May) Vol. 112, No. 6, pp. 703-9. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1241965.	Does not fulfil criteria 6 (exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified). Embryos were incubated in vitro for 96 hrs. This is not a plausible route of exposure for wild mammals.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.1.4	De Solla, S.R., Palonen K.E., Martin P.A.	2014	Toxicity of pesticides associated with potatoe production, including soil fumigants, to snapping turtle eggs (*Cheludra serpentine*).	Environmental toxicology and chemistry/SETAC (2014 Jan) 33 (1): 102-106.	Does not fulfil criteria 8 (effects are not related to a single test item). Soil was treated with a mixture of chlorothalonil, S-metolachlor, metribuzin, and chlorpyrifos applied at typical and higher field application rates. Turtle eggs were incubated in soil in outdoor plots. The mixture did not affect survivorship, deformities, or body size at applications up to 10 times the typical field application rates. Hatching success ranged between 87% and 100% for these treatments.
CA 8.1.4	De Solla, S.R., Martin, P.A	2011	Absorption of current use pesticides by snapping turtle (*Chelydra serpentina*) eggs in treated soil.	Chemosphere, (2011 Oct) Vol. 85, No. 5, pp. 820-5. Electronic Publication Date: 8 Sep 2011. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535	Does not fulfil criteria 8 (effects are not related to a single test item). Snapping turtle (Chelydra serpentina) eggs were incubated in soil that was treated with 10 pesticides (atrazine, simazine, metolachlor, azinphos-methyl, dimethoate, chlorpyrifos, carbaryl, endosulfan (I and II), captan, and chlorothalonil).
CA 8.1.4	De Solla, S., Martin, P.	2010	Relationship between pesticide properties and absorption in turtles eggs from treated soil.	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 64. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.1.4	Papoulias, D.M. , Schwarz, M.S., Mena, L.	2013	Gonadal abnormalities in frogs (*Lithobates* spp.) collected from managed wetlands in an agricultural region of Nebraska, USA.	Environmental Pollution, (January 2013) Vol. 172, pp. 1-8. Refs: 78. ISSN: 0269-7491; E-ISSN: 1873-6424; CODEN: ENPOEK	Does not fulfil criteria 4 (test organisms are not previously exposed to the test material or other contaminants) and criteria 8 (effects are not related to a single test item). Wild caught froglets from river water basins where agriculture is conducted and atrazine, glyphosate an metolachlor are used. The paper tries to relate morphological observations in frogs to the original source location. Not clear what else the frogs may have been exposed to as only these 3 compounds were examined analytically.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.1.4	Spolyarich N., Hyne R.V., Wilson S.P., Palmer C.G., Byrne M.	2011	Morphological abnormalities in frogs from a rice-growing region in NSW, Australia, with investigations into pesticide exposure.	Environmental monitoring and assessment, (2011 Feb) Vol. 173, No. 1-4, pp.397-407. Journal code: 8508350. E-ISSN: 1573-2959. L-ISSN: 0167-6369.	Text relates to chemical sampling of watercourses that contain a mixture of pesticides and does not include exposure of test organisms. So there are no effects to relate to the risk assessment from this paper.
CA 8.2.1	Zhou, B., Zhao, M.-R., Huang, H.-F.	2008	Study on zebrafish embryo-toxicity of four pesticides	Zhejiang Gongye Daxue Xuebao (2008), 36 (2), 136-140. ISSN: 1006-4303	English version of publication unavailable; English abstract available The effects on zebrafish embryos on morphological development, survival and percent hatching at 2.8, 28, 283 and 2838 mg/L. Effects on survival, abnormality and reduced feeding were observed at the 2838 mg/L concentration only. This relevant information indicating an effect on zebrafish embryos. The result is in line with the current regulatory EU fish acute and chronic endpoints of 1.23 mg/L and 0.78 mg/L. The effects seen were at concentrations much in exceedance of expected PEC_{sw} therefore tis reference is not relevant for this review.
CA 8.2	Caquet Th., Roucaute M; Mazzella N; Delmas F; Madigou C; Farcy E; Burgeot Th; Allenou J-P; Gabellec R	2013	Risk assessment of herbicides and booster biocides along estuarine continuums in the Bay of Vilaine area (Brittany, France).	Environmental science and pollution research international, (2013 Feb) Vol. 20, No. 2, pp. 651-66. Electronic Publication Date: 16 Sep 2012 Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.	Text relates to chemical sampling only and does not include exposure of test organisms. So there are no effects to relate to the risk assessment from this paper.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2	Kolpin, D.W., Hubbard, L.E.,. Blazer, V.S., Young, J.A., Iwanowicz, L.R., Gray, J.L., Foreman, W.T., Furlong, E.T., Zaugg, S.D., Sandstrom, M.W., Focazio, M.J., Alvarez, D.A., Speiran, G.K., Meyer, M.T., Barber, L.B.	2013	Chemical contaminants in water and sediment near fish nesting sites in the Potomac River basin: Determining potential exposures to smallmouth bass (*Micropterus dolomieu*).	Science of the Total Environment, (5 Jan 2013) Vol. 443, pp. 700-716. Refs: 85. ISSN: 0048-9697; E-ISSN: 1879-1026 CODEN: STEVA8	Text relates to chemical sampling only and does not include exposure of test organisms. So there are no effects to relate to the risk assessment from this paper.
CA 8.2	Berube, V.E., Boily, M.H, DeBlois, C., Dassylva, N., Spear, P.A.	2005	Plasma retinoid profile in bullfrogs, *Rana catesbeiana*, in relation to agricultural intensity of sub-watersheds in the Yamaska River drainage basin, Quebec, Canada.	Aquatic toxicology (Amsterdam, Netherlands), (2005 Jan 26) Vol. 71, No. 2, pp. 109-20. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.	Does not fulfil criteria 8 (effects are not related to a single test item). This research is not relevant as bullfrogs were collected from various watersheds which contained mixtures of up to nine pesticides. So the contribution of metolachlor to the retinoid profile of bullfrogs could not be quantified
CA 8.2	Dussault, S., Fortier, M., Boily, M., Brousseau, P., Fournier, M.	2010	Immune status of the bullfrog (*Rana catesbeiana*) exposed to agripesticides	Canadian Technical Report of Fisheries and Aquatic Sciences, (2010) Vol. 2883, pp. 66. Meeting Info.: 36th Annual Workshop on Aquatic Toxicity. La Malbaie, CANADA. September 27-30, 2009. CODEN: CTRSDR. ISSN: 0706-6457. E-ISSN: 0706-6570.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2	Shutler, D., Marcogliese, D.J.	2011	Leukocyte profiles of Northern Leopard Frogs, *Lithobates pipiens*, exposed to pesticides and hematozoa in agricultural wetlands.	Copeia (2011), Number 2, pp. 301-307. ISSN: 0045-8511	Does not fulfil criteria 8 (effects are not related to a single test item). A mixture of atrazine and metolachlor was used.
CA 8.2	McDaniel, T.V., Martin, P.A., Struger, J., Sherry, J., Marvin, C.H., McMaster, M.E., Clarence, S., Tetreault, G.	2008	Potential endocrine disruption of sexual development in free ranging male northern leopard frogs (*Rana pipiens*) and green frogs (*Rana clamitans*) from areas of intensive row crop agriculture. [Erratum to document cited in CA149:301052]	Aquatic Toxicology (2008), 90 (1), 82. CODEN: AQTODG; ISSN: 0166-445X	Does not fulfil criteria 8 (effects are not related to a single test item). Assessed in the endocrine review CGA077102_11322. Blood samples were taken from wild caught frogs from agricultural sites and examined for endocrine markers of endocrine disruption. Therefore the frogs were likely to have been exposed to more than one compound. This is therefore not relevant to this review.
CA 8.2	Solis, M.E., Liu, C.C., Nam, P., Niyogi, D.K., Bandeff, J.M., Huang, Y.-W.	2007	Occurrence of organic chemicals in two rivers inhabited by Ozark hellbenders (*Cryptobranchus alleganiensis bishopi*)	Archives of Environmental Contamination and Toxicology (2007), 53 (3), 426-434. CODEN: AECTCV; ISSN: 0090-4341	Not relevant as water monitoring study only. No ecotoxicological testing of hellbenders was conducted.
CA 8.2	Gutierrez, M.M.	2007	Evidence of endocrine disruption in amphibians due to agricultural chemical exposure.	Dissertation Abstracts International. Vol. 69, no. 6. 2007. Dissertation Number: AAI3319626. ISSN: 0419-4217 Published by: University Microfilms International, P.O. Box 1764, Ann Arbor, MI, 48106, USA	Atrazine focused paper. No data generated on S-metolachlor or metolachlor or their metabolites.
CA 8.2.1	Polard T., Jean, S., Gauthier, L., Laplanche, C., Merlina, G., Sanchez-Perez J.M., Pinelli, E.	2011	Mutagenic impact on fish of runoff events in agricultural areas in south-west France.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Jan 17) Vol. 101, No. 1, pp. 126-34. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	Does not fulfil criteria 8 (effects are not related to a single test item).

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.1	Tierney, K.B., Sampson, J.L., Kennedy, C.J., Ross, P.S., Sekela, M.A., Kennedy, C. J.	2008	Salmon olfaction is impaired by an environmentally realistic pesticide mixture.	Environmental Science and Technology, (1 Jul 2008) Vol. 42, No. 13, pp. 4996-5001. Refs: 26. ISSN: 0013-936X; CODEN: ESTHAG	Does not fulfil criteria 8 (effects are not related to a single test item).
CA 8.2.1	Haluzova, I., Modra, H., Mikula, P., Svobodova, Z.	2009	Subchronic exposure of the common carp (*Cyprinus carpio*) to four herbicide formulations: Effect on the haematological indice.	Toxicology Letters (Shannon), (SEP 13 2009) Vol. 189, No. Sp. Iss. SI, pp. S210. Meeting Info.: 46th Congress of the European-Societies-of-Toxicology. Dresden, GERMANY. September 13 -16, 2009. CODEN: TOLED5. ISSN: 0378-4274. DT Conference; (Meeting)	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.1	Dobsikova, R., Blahova, J., Modra, H., Skoric, M., Svobodova, Z.	2011	The effect of acute exposure to herbicide Gardoprim Plus Gold 500 SC on haematological and biochemical indicators and histopathological changes in common carp (*Cyprinus carpio* L.).	Acta Veterinaria Brno (2011) Volume 80, Number 4, pp. 359-363, 14 refs. ISSN: 0001-7213. DOI: 10.2754/avb201180040359	Does not fulfil criteria 8 (effects are not related to a single test item). Gardoprim Plus Gold 500 SC formulation was tested which contains both terbuthylazine and S-metolachlor.
CA 8.2.1	Buckler, D.R., Mayer, F.L., Ellersieck, M.R., Asfaw, A.	2005	Acute Toxicity Value Extrapolation with Fish and Aquatic Invertebrates	Archives of Environmental Contamination and Toxicology (2005), 49 (4), 546-558. CODEN: AECTCV; ISSN: 0090-4341	Reference evaluated data from other sources. No new data presented.
CA 8.2.1 CA 8.2.4 CA 8.2.6	Passy, S.I., Bode, R.W., Carlson, D. M., Novak, M. A.	2004	Comparative environmental assessment in the studies of benthic diatom, macroinvertebrate, and fish communities	International Review of Hydrobiology (2004), 89 (2), 121-138. ISSN: 1434-2944	Does not fulfil criteria 8 (effects are not related to a single test item).

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2	Ayansina, A.D.V., Muhammad, R.G.	2014	An evaluation of the effect of four herbicides on some aquatic organisms.	International Journal of Biological and Chemical Sciences (2014), Volume 8, Number 1, pp. 304-313, 23 refs. ISSN: 1991-8631	Requested in September 2014. Our Library staff tried until 19 November 2014 to obtain this reference without success. They were not able to provide the article/ copyright permission of the publication requested. The requested article/ permission was not available through our primary source at the present. Our Advanced Referencing specialist contacted the publisher of International journal of biological and chemical sciences (http://www.ajol.info/index.php/ijbcs/about/contact) via ijbcs@yahoo.fr, ijbcs.ifg@gmail.com, ijbcs_ifg@yahoo.fr and fax +237 33 45 11 02 (failed) but despite numerous efforts at contact with the publisher our attempts remain unanswered. In addition the author was contacted (Victor Ayansina) via ayandvt@yahoo.com who replied that the publisher is the rights holder in this case. It has not therefore been possible to review this article. This is not considered to be an issue given the wealth of data available on aquatic organisms for S-metolachlor and metolachlor.
CA 8.2.1	Perez, J.R.	2011	Effects of s-triazines and metolachlor on chlorpyrifos toxicity in Zebrafish (*Danio rerio*) early life-stages	Conference: 21st Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2011), Milano Convention Centre, Milan, 15 May 2011 - 19 May 2011	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.1	Babatunde, M.M., Balogun, J.K., Auta, J., Balarabe, M.L., Auta, J., Balogun, J.K., Bolorundur o, P.I., Editor(s): Onimisi, H.U.	2009	Acute toxicity of galex to *Oreocromis niloticus* (Trewavas) in Nigeria	Proceedings of the 23rd annual conference of the Fisheries Society of Nigeria. pp. 159-164. 2009. Conference: 23rd annual conference of the fisheries Society of Nigeria (FISON), Kaduna (Nigeria), 26-30 Oct 2008	Does not fulfil criteria 8 (effects are not related to a single test item). Galex is not the relevant formulation for the EU. Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.1	Ubachukwu, P.O., Oluah, N.S., Omeje, C.U., Ikele, C.B.	2012	Effect of herbicide (Primextra) on tissue cholesterol level in *Clarias gariepinus* juvenile.	Animal Research International (2012), Volume 9, Number 1, pp. 1524-1528, 16 refs. ISSN: 159-3115	Does not fulfil criteria 8 (effects are not related to a single test item).
CA 8.2.4.1	Souissi Y., Bouchonnet, S; Bourcier, S; Kusk K. O.; Sablier M., Andersen H. R.	2013	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water.	The Science of the total environment, (2013 Aug 1) Vol. 458-460, pp. 527-34. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697	Does not fulfil criteria 6. The treated water from waste water treatment plants is unlikely to go back into the environment. In addition to this the length of time the water has been irradiated for (90 mins) is vastly in excess of UV water treatment procedures where the flow rates are more L/s, therefore exposure time is seconds.
CA 8.2.5.1	Liu, H., Zhan, X., Ye, W., Liu, W.	2005	Ecotoxicological difference of chiral pesticides: chronic toxicity of metolachlor and S-metolachlor to *Daphnia magna*	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 492-496. CODEN: PEACF2; ISSN: 1524-6434	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.4.1 CA 8.2.5.1 CA 8.5	Liu, W., Fang, Q., Ma, Y.	2005	Selectivity in aquatic toxicity and biodegradation of the herbicide Metolachlor	Abstracts of Papers, 230th ACS National Meeting, Washington, DC, United States, Aug. 28-Sept. 1, 2005 (2005), AGRO-060. Publisher: American Chemical Society, Washington, D. C. CODEN: 69HFCL	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.5.2	Liu, H.J.	2006	Ecotoxicological difference of Rac-Metolachlor and S-Metolachlor	Conference: 16th Europe Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), World Forum Convention Center, Hague (Netherlands (The)), 7 May 2006 - 11 May 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Praet, N. van; Bruyn, L. de; Jonge, M. de; Vanhaecke, L.; Stoks, R.; Bervoets, L.; van Praet, N.; de Bruyn, L.; de Jonge, M.	2014	Can damsel fly larvae (*Ischnura elegans*) be used as bioindicators of sublethal effects of environmental contamination?	Aquatic Toxicology (2014), Volume 154, pp. 270-277. ISSN: 0166-445X	Does not fulfil criteria 4 (test organisms are not previously exposed to the test material or other contaminants) or criteria 8 (effects are not related to a single test item);
CA 8.2.5.2	Lizotte, R., Testa, S., Locke, M., Martin. A, Steinriede, R.W.	2013	Responses of phytoplankton and *Hyalella azteca* to agrichemical mixtures in a constructed wetland mesocosm.	Archives of environmental contamination and toxicology, (2013 Oct) Vol. 65, No. 3, pp. 474-85. Electronic Publication Date: 23 Jun 2013. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.	Does not fulfil criteria 8 (effects are not related to a single test item). A mixture of S-metolachlor was tested together with atrazine and permethrin. Therefore the effects of S-metolachlor are difficult to distinguish. This is therefore not relevant to his review.
CA 8.2.5.2	Lizotte, R.E., Shields, F.D., Testa, S.	2012	Effects of a simulated agricultural runoff event on sediment toxicity in a managed backwater wetland	Water, air, and soil pollution (2012), Volume 223, Number 8, pp. 5375-5389. ISSN: 1573-2932	Does not fulfil criteria 8 (effects are not related to a single test item). A pesticide mixture of atrazine, metolachlor and permethrin was pumped into hydrologically managed floodplain wetland to mimic a run-off event. The effects of this mixture on *Hyalella azteca* were assessed in acute 48h laboratory tests. So there is no solo metolachlor data which is relevant to this review in this paper.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Lizotte, R.E., Knight, S.S., Bryant, C.T., Smith, S.	2009	Agricultural Pesticides in Mississippi Delta Oxbow Lake Sediments During Autumn and Their Effects on *Hyalella azteca*.	Archives of Environmental Contamination and Toxicology, (OCT 2009) Vol.57, No. 3, pp. 495-503. CODEN: AECTCV. ISSN: 0090-4341.	Does not fulfil criteria 8 (effects are not related to a single test item). Sediment was collected from Mississippi Delta oxbow lakes and their effects and bioavailability to *Hyalella azteca* were assessed. Each sediment was analyzed for 17 current and historic-use pesticides and metabolites. Chronic 28-day *H. azteca* sediment bioassays and pesticide body residue analyses were conducted. The compound p,p0-DDE [1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene] was ubiquitous. 7/15 samples contained metolachlor and the maximum concentration was 0.15 µg/g. No significant (p[0.05) differences in *H. azteca* survival. So there is no solo metolachlor data which is relevant to this review in this paper.
CA 8.2.5.2	Lizotte, R.E., Knight, S.S., Shields, F.D., Bryant, C.T.	2009	Effects of an atrazine, metolachlor and fipronil mixture on *Hyalella azteca* (Saussure) in a modified backwater wetland.	Bulletin of environmental contamination and toxicology, (2009 Dec) Vol. 83, No. 6, pp. 836-40. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.	Does not fulfil criteria 8 (effects are not related to a single test item). A pesticide mixture of atrazine and metolachlor (as Bicep II Magnum) was injected into the wetland. Effects of this mixture on *Hyalella azteca* were assessed. Acute 96h tests were also conducted with fipronil. So there is no solo metolachlor data which is relevant to this review in this paper.
CA 8.2.5.2	Moore, M.T. (Reprint Author), Lizotte, R.E., Cooper, C.M., Smith, S., Knight, S.S.	2004	Survival and growth of *Hyalella azteca* exposed to three Mississippi Oxbow lake Sediments.	Bulletin of Environmental Contamination and Toxicology, (April 2004) Vol. 72, No. 4, pp. 777-783. ISSN: 0007-4861.	Does not fulfil criteria 8 (effects are not related to a single test item). A pesticide mixture of atrazine, metolachlor and permethrin was pumped into hydrologically managed floodplain wetland to mimic a run-off event. The effects of this mixture on *Hyalella azteca* were assessed in acute 48h laboratory tests. So there is no solo metolachlor data which is relevant to this review in this paper. (Same comment as above for reference 334).

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Perez, J.R., Loureiro, S.M., Soares, A.M.V.M.	2010	Effects of atrazine and metolachlor on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23 May 2010-27 May 2010	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.5.2	Loureiro, S., Perez, J.R., Soares, A.M.V.M.	2010	Effects of atrazine, metolachlor and endosulfan on chlorpyrifos toxicity in *Chironomus riparius*	Conference: 20th Annual Meeting of the Europe branch of the Society of Environmental Toxicology and Chemistry (SETAC 2010), Palacio de Congresos y Exposiciones - FIBES, Seville, 23-27 May 2010	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.5.2	Gerhardt, A., Koster, M., Lang, F., Leib, V.	2012	Active in situ biomonitoring of pesticide pulses using *Gammarus* spp. In small tributaries of lake Constance	Journal of Environmental Protection (2012), 3 (7), 573-583. ISSN: 2152-2197	Does not fulfil criteria 8 (effects are not related to a single test item). The survival and feeding behavior of caged gammarids were investigated small streams in the catchment of Lake Constance. Metolachlor was found at 0.01 to 2.7 µg/L alongside >16 other crop protection compounds. The effects of metolachlor are not discernable as a mixture was examined.
CA 8.2.5.2	Guy, M., Singh, L., Mineau, P.	2011	Using field data to assess the effects of pesticides on crustacea in freshwater aquatic ecosystems and verifying the level of protection provided by water quality guidelines	Integrated Environmental Assessment and Management (2011), 7 (3), 426-436. CODEN: IEAMCK; ISSN: 1551-3777	Not relevant. Paper covers the modelling of existing data.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Collin, H., Meistertzheim, A.-L., David, E., Moraga, D., Boutet, I.	2010	Response of the Pacific oyster *Crassostrea gigas*, Thunberg 1793, to pesticide exposure under experimental conditions.	The Journal of experimental biology, (2010 Dec 1) Vol. 213, No. Pt 23, pp. 4010-7. Journal code: 0243705. E-ISSN: 1477-9145. L-ISSN: 0022-0949.	Does not fulfil criteria 4 (test organisms are not previously exposed to the test item or other contaminants. Oysters were collected from two polluted sites. In the 'low' pollution area 2 and 4.7 µg/kg lindane and DDT were found in bivalve tissues. In the 'high' pollution area 6 and 11 µg/kg lindane and DDT were found in bivalve tissues. No mention of S-metolachlor or metolachlor so not relevant.
CA 8.2.5.2	Gagnaire, B., Gay, M., Huvet, A., Daniel, J-Y., Saulnier, D., Renault, T.	2007	Combination of a pesticide exposure and a bacterial challenge: in vivo effects on immune response of Pacific oyster, *Crassostrea gigas* (Thunberg).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Aug 15) Vol. 84, No.1, pp. 92-102. Journal code: 8500246. ISSN: 0166-445X. L-ISSN: 0166-445X.	Does not fulfil criteria 8 (effects are not related to a single test item). Not relevant as a mixture of 8 pesticides (atrazine, glyphosate, alachlor, metolachlor, fosetyl-alumimium, terbuthylazine, diuron and carbaryl) was used. Haemocyte parameters (cell mortality, enzyme activities and phagocytosis) were monitored using flow cytometry and gene expression was evaluated by real-time PCR (RT-PCR). The effects of metolachlor are not discernable as a mixture was examined.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Gagnaire, B., Burgeot, T., Geret, F., Thomas-Guyon, H., Renault, T., Editor(s): Feunteun, E., Miramand, P.	2006	Effect of heavy metals and herbicides on immune capacities in Pacific oyster, *Crassostrea gigas*. 599/1308	Cahiers de Biologie Marine (2006) Volume 47, Number 1, pp. 105-107, 7 refs. ISSN: 0007-9723	Does not fulfil criteria 8 (effects are not related to a single test item). In vitro and in vitro experiments to determine the effects of heavy metals and herbicides on immune capacities in Pacific oyster, *C. gigas*. The in vitro experiments focused on the direct contact between pollutants and cells of the immune system, the haemocytes. A mixture of 8 pesticides: carbaryl (10 pM-1 μM), diuron (179 pM-17 μM), atrazine (300-30 μM), terbuthylazine (260 pM-26 μM), alachlor (70 pM-7 μM), metolachlor (70 pM-7 μM), glyphosate (120 pM-12 μM) and foseryl-aluminium [fosetyl] (7 pM-0.7 μM). The in vivo experiments consisted of a contact between oysters and contaminated water. A mixture of 8 pesticides: carbaryl (0.25 nM), diuron (2 nM), atrazine (3 nM), terbuthylazine (2.5 nM), alachlor (3 nM), metolachlor (2 nM), glyphosate (4 nM) and fosetyl-aluminium (2 nM). The in vitro experiments showed that the pesticide mixture at high concentrations induced an increase of phagocytosis activity. The pesticide mixture also modulated phagocytosis in vivo by inducing a decrease after a 7-day contamination period. The effects of metolachlor are not discernable as a mixture was examined.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Geret, F., Burgeot T., Haure J., Gagnaire B., Renault T., Communal P.Y., Samain, J.F.	2013	Effects of low-dose exposure to pesticide mixture on physiological responses of the Pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2013 Dec) Vol. 28, No. 12, pp. 689-99. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.	Does not fulfil criteria 8 (effects are not related to a single test item). Effects on the physiology of Pacific oyster, *Crassostrea gigas*, of a mixture of pesticides containing 0.8 µg/L alachlor, 0.6 µg/L metolachlor, 0.7 µg/L atrazine, 0.6 µg/L terbuthylazine, 0.5 µg/L diuron, 0.6 µg/L fosetyl aluminum, 0.05 µg/L carbaryl, and 0.7 µg/L glyphosate for a total concentration of 4.55 µg/L. The total nominal concentration of pesticides mixture corresponds to the pesticide concentrations in the shellfish culture area of the Marennes-Oleron basin. Two varieties of *C. gigas* were tested for 7d under controlled conditions. The effects were assessed using enzyme biomarkers of nitrogen metabolism (GS, glutamine synthetase), detoxification metabolism (GST, glutathione S-transferase), and oxidative stress (CAT, catalase). Sublethal effects on hemocyte parameters (phagocytosis and esterase activity) and DNA damages (DNA adducts) were also measured. Changes in metabolic activities were characterized by increases in GS, GST, and CAT levels on the first day of exposure for the "resistant" oysters and after 3-7 days of exposure for the "susceptible" oysters. The formation of DNA adducts was detected after 7 days of exposure. The percentage of hemocyte esterase-positive cells was reduced in the resistant oysters, as was the hemocyte phagocytic capacity in both oyster varieties after 7 days of exposure to the pesticide mixture. The effects of metolachlor are not discernable as a mixture was examined.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Geret, F., Burgeot, T., Haure, J., Gagnaire, B., Renault, T., Communal, P.Y., Samain, J.F.	2011	Effects of low-dose exposure to pesticide mixture on physiological responses of the pacific oyster, *Crassostrea gigas*.	Environmental toxicology, (2011 Oct 19). Electronic Publication Date: 19 Oct 2011. Journal code: 100885357. E-ISSN: 1522-7278. L-ISSN: 1520-4081.	Does not fulfil criteria 8 (effects are not related to a single test item). Effects on the physiology of Pacific oyster, *Crassostrea gigas*, of a mixture of pesticides containing 0.8 l µg/L alachlor, 0.6 µg/L metolachlor, 0.7 µg/L atrazine, 0.6 µg/L terbuthylazine, 0.5 µg/L diuron, 0.6 µg/L fosetyl aluminum, 0.05 µg/L carbaryl, and 0.7 µg/L glyphosate. The early effects of the mixture were assessed using enzyme biomarkers of nitrogen metabolism, detoxification metabolism, and oxidative stress. Sublethal effects on haemocyte parameters (phagocytosis and esterase activity) and DNA damages (DNA adducts) were also measured. The effects of metolachlor are not discernable as a mixture was examined.
CA 8.2.5.2	Geret, F., Gagnaire, B., Menard, D., Renault, T., Le Roux, A., Haure, J., Bocquene, G., Burgeot, T.	2004	Response of the pacific oyster *Crassostrea gigas* to pesticide exposition under experimental conditions.	Marine Environmental Research, (August 2004) Vol. 58, No. 2-5, pp. 312-313. Meeting Info.: 12th International Symposium on Pollutant Responses in Marine Organisms (PRIMO 12). Safety Harbor, FL, USA. May 09-13, 2003. CODEN: MERSDW. ISSN: 0141-1136.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.5.2	Mai, H., Gonzalez, P., Pardon, P., Tapie, N., Budzinski, H., Cachot, J., Morin, B.	2014	Comparative responses of sperm cells and embryos of Pacific oyster (*Crassostrea gigas*) to exposure to metolachlor and its degradation products.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 48-56. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	Does not fulfil criteria 8 (effects are not related to a single test item).

CA 8.2.5.2	Mai, H., Morin, B., Pardon P., Gonzalez P., Budzinski H., Cachot J.	2013	Environmental concentrations of irgarol, diuron and S-metolachlor induce deleterious effects on gametes and embryos of the Pacific oyster, *Crassostrea gigas*.	Marine environmental research, (2013 Aug) Vol. 89, pp. 1-8. Journal code: 9882895. E-ISSN: 1879-0291. L-ISSN: 0141-1136.	Does not fulfil criteria 8 (effects are not related to a single test item). Toxicity of S-metolachlor was evaluated in Pacific oyster (*Crassostrea gigas*) gametes or embryos exposed to concentrations of 0.0001× to 1.0 µg/L. Tests were performed on (1) spermatozoa (2) oocytes and (3) both spermatozoa and oocytes; gametes were exposed for 30 mins and for 1 to 3, examined over subsequent 24h for fertilization success and offspring development. After exposure of 1.0 µg/L to sperm, oocytes or both, fertilisation success was 85% (96% in controls). There was 25%, 30% and 33% of abnormal larvae for sperm, oocytes or both exposed to 1.0 µg/L (control 4-5%). The results were considered to be a dose response. This test type can be difficult to fulfil the test criteria. The validity criteria for the control is to have <40% abnormal larvae. When tests have such a large allowance for the control, this is indicative that this parameter is very variable and that abnormal D-larvae prevalence is a common occurrence for the test species. Therefore there should be some caution before the results of this test are considered of critical significance as no effects >33% were found. The NOECs have been presented in the paper, however the results of this test are usually expressed as a 24h EC_{50}. The values would be >1.0 µg/L for the endpoints measured. The filtered seawater (FSW) used for test solutions came from Arcachon Bay. Table 1 shows up to 40 ng/L diuron, 22 ng/L irgarol and 5 ng/L metolachlor have been found. Samples analysed of the FSW used for the test contained 1-2ng/L of these 3 compounds. However, no screening was conducted for other compounds. Mai *et al*. 2012 (Ref. ID 35) found copper (700 to 810 ng/L), cadmium (9 ng/L) and Irgarol (2 to 22 ng/L) are also present in the Arachon Bay. Mai *et al* (2012) also found that the NOEC for copper toxicity to *C. gigas* gametes from a very similar test design was <1 µg/L. As the FSW was not analysed the presence of other pollutants cannot be confirmed. There was no analytical confirmation of test concentrations and the study is not GLP. The GLP regulatory study found an EC_{50} of 9.8 mg/L. Therefore this paper has not been considered relevant for this review.
CA 8.2.5.2	Mai, H., Cachot, J., Brune, J.,	2012	Embryotoxic and genotoxic effects of heavy metals and	Marine pollution bulletin, (2012 Dec) Vol. 64, No. 12, pp.	Does not fulfil criteria 8 (effects are not related to a single test item).

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
	Geffard, O., Belles, A., Budzinski, H., Morin, B.		pesticides on early life stages of Pacific oyster (*Crassostrea gigas*).	2663-70. Journal code: 0260231. E-ISSN: 1879-3363. L-ISSN: 0025-326X.	After 24 h exposure, significant increases of the percentage of abnormal D-larvae and the DNA strand breaks were observed from l.0 µg/L metolachlor in comparison with the controls. The EC_{50} was >10 µg/L. The amount of abnormal D-larvae in the control was 20%. Filtered seawater (FSW) used for test solutions came from Arcachon Bay. As discussed for Ref ID 29/1308 other compounds which are toxic to oysters have been found in those waters and no screening for other toxicants was conducted prior to use. Therefore it is not certain whether the effects noted all result from metolachlor exposure.
CA 8.2.5.2	Auby, I; Bocquene, G; Quiniou, F; Dreno, J.P.	2007	Arcachon basin 's weedkillers and insecticides contamination analysis (2005-2006 period) environmental impact.	Plouzane (France). 2007. Published by: Plouzane (France)	Text relates to chemical sampling only and does not include exposure of test organisms. So there are no effects to relate to the risk assessment from this paper.
CA 8.2.5.2	Birchfield, N., Corbin, M., Doelling-Brown, P., Hurley, P.	2006	Risk Assessment of Racemic Metolachlor use to 26 Evolutionarily Significant Units of Endangered and Threatened Pacific Salmon and Steelhead	Conference: 27th Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC 2006), Montreal, Quebec (Canada), 3 Nov 2006 - 9 Nov 2006 Sponsor(s): Society of Environmental Toxicology and Chemistry (SETAC)	Reference evaluated data from other sources. No new data presented.
CA 8.2.5.2	Belanger, R.M., Sabhapathy, G.S., Khan, S.	2014	Atrazine and metolachlor exposure affects the chemosensory responses of male crayfish (*Orconectes rusticus*) to female odors.	Integrative and Comparative Biology, (2014) Vol. 54, No. Suppl. 1, pp. E15. http://icb.oxfordjournals.org/. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative-Biology. Austin, TX, USA. Jan. 03-07, 2014. ISSN: 1540-7063. E-ISSN: 1557-7023.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.5.2	Sanchez-Bayo, F.	2006	Comparative acute toxicity of organic pollutants and reference values for crustaceans. I. Branchiopoda, Copepoda and Ostracoda	Environmental Pollution (Amsterdam, Netherlands) (2006), 139 (3), 385-420 CODEN: ENPOEK; ISSN: 0269-7491	No new data presented in this reference. Pre-existing data was compared. Hence it is not relevant for this literature search.
CA 8.2.5.2	Smalling, K.L., Morgan, S., Kuivila, K.K.	2010	Accumulation of current-use and organochlorine pesticides in crab embryos from northern California, USA	Environmental Toxicology and Chemistry (2010), 29 (11), 2593-2599. CODEN: ETOCDK; ISSN: 0730-7268	Crabs were collected from a rocky intertidal area downstream of a suburban golf course (S-metolachlor is not a golf-course herbicide), and a saltmarsh surrounded by an urban area. Crab embryos were screened for metolachlor, none was detected. Not relevant to the risk assessment.
CA 8.2.5.2	Toropov, A.A., Benfenati, E.	2006	QSAR models for *Daphnia* toxicity of pesticides based on combinations of topological parameters of molecular structures 417/559	Bioorganic & Medicinal Chemistry (2006), 14 (8), 2779-2788. CODEN: BMECEP; ISSN: 0968-0896	Irrelevant as this paper deals with predictive toxicity not actual measured values, therefore no new data provided.
CA 8.2.6.1	Chalifour, A., Spear, P.A., Boily, M.H., DeBlois, C., Giroux, I., Dassylva, N., Juneau, P.	2009	Assessment of toxic effects of pesticide extracts on different green algal species by using chlorophyll a fluorescence	Toxicological and Environmental Chemistry (2009), 91 (7), 1315-1329. CODEN: TECSDY; ISSN: 0277-2248	Does not fulfil criteria 8 (effects are not related to a single test item). *Chlorella vulgaris*, *Scenedesmus obliquus* and *Pseudokirchneriella subcapitata* (green algae) were tested to metolachlor at a maximum of 1.7 µg/L in a mixture together with Desisopropyl-atrazine; Deethyl-atrazine, Simazine, Atrazine, Dimethenamid. It is therefore not possible to define the effects of metolachlor on these algal species from this study.
CA 8.2.6.1	Vogwill, T., Lagator, M., Colegrave, N., Neve, P.	2012	The experimental evolution of herbicide resistance in *Chlamydomonas reinhardtii* results in a positive correlation between fitness in the presence and absence of herbicides	Journal of Evolutionary Biology (2012), 25 (10), 1955-1964. ISSN: 1010-061X	Not relevant as 'fitness' of algae exposed to S-metolachlor for several generations was compared to 'fitness' of algae which had no previous exposure. Also, there was no mention of concentrations of S-metolachlor used

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.6.2	Hu, X.-N., Zhang, S.-X., Chen, C.-D., Liu, H.-J,.	2014	Influence of the coexistence of Zn2+ on the enantioselective toxicity of metolachlor to *Scenedesmus obliquus*.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2014 Jan) Vol. 35, No. 1, pp. 292-8. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.	English version of publication unavailable; English abstract provided enough information to confirm relevance. Does not fulfil criteria 5 (several doses tested, at least 3, including a negative control, to establish a dose response. The enantioselective toxicity of Rac-, S-metolachlor alone was included in a test *Scenedesmus obliquus*. Only one rate was tested at 0.30 mg/L Rac- and S-metolachlor, resulting in 24 h inhibition rates of 49.6% and 59.7%, respectively.
CA 8.2.4.1 & algae CA 8.2.6.1	Kyriakopoulou, K., Anastasiadou, P., Machera, K.	2009	Comparative Toxicities of Fungicide and Herbicide Formulations on Freshwater and Marine Species	Bulletin of Environmental Contamination and Toxicology (2009), 82 (3), 290-295. CODEN: BECTA6; ISSN: 0007-4861	Does not fulfil criteria 8 (effects are not related to a single test item). Not relevant as S-metolachlor was tested in a mixture with terbuthylazine.
CA 8.2.6.2	Roubeix, V., Fauvelle, V., Tison-Rosebery, J., Mazzella, N., Coste M., Delmas F.	2012	Assessing the impact of chloroacetanilide herbicides and their metabolites on periphyton in the Leyre River (SW France) via short term growth inhibition tests on autochthonous diatoms.	Journal of environmental monitoring : JEM, (2012 May) Vol. 14, No. 6, pp. 1655-63. Journal code: 100968688. E-ISSN: 1464-0333. L-ISSN: 1464-0325.	Does not fulfil criteria 4 (test organisms are not previously exposed to the test item or other contaminants. The algae in the test were taken from rocks at sites in the Leyre River is the major tributary to the Bassin d'Arcachon (lagoon, SW French Atlantic coast). Area of maize cultivation and metolachlor and acetochlor have been found in the river. The 96 h EC_{50}s from this study were 18 to 21 mg/L for the standard laboratory test with *Nitzschia nana*. Therefore the test organisms are likely to be previously exposed to these or other contaminants; therefore it was not considered to be relevant for this review.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.6.2	Roubeix, V., Mazzella, N., Mechin, B., Coste, M., Delmas, F.	2011	Impact of the herbicide metolachlor on river periphytic diatoms: experimental comparison of descriptors at different biological organization levels.	Annales de Limnologie - International Journal of Limnology (2011) Volume 47, Number 3, pp. 239-249, 46 refs. ISSN: 0003-4088. DOI: 10.1051/limn/2011009	Does not fulfil criteria 4 (test organisms are not previously exposed to the test item or other contaminants. Two week microcosm test in which naturally derived diatom communities were exposed to two concentrations of metolachlor. Monospecific tests were also conducted. For these two species of diatom were exposed to different concs of metolachlor. EC_{50} values were 2.96 and 1.88 mg/L for *Surirella angusta* and *Achnathidium minutissimum*, respectively. The diatoms from 3 rivers in SW France (the Ge`ze, Sousson and Save, "Coteaux de Gascogne") with different exposures to agricultural pollution. Therefore the test organisms are likely to be previously exposed to these or other contaminants; therefore it was not considered to be relevant for this review.
CA 8.2.6.2	Debenest, T., Pinelli, E., Coste, M., Silvestre, J., Mazzella, N., Madigou, C., Delmas, F.	2009	Sensitivity of freshwater periphytic diatoms to agricultural herbicides.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 4) Vol. 93, No. 1, pp. 11-7. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X	Does not fulfil criteria 4 (test organisms are not previously exposed to the test item or other contaminants. Diatoms were collected from the river Save. This site reportedly contained low concentrations of herbicides (≈0.2 µg/L). These herbicides were not quantified and therefore pre-exposure to S-metolachlor cannot be excluded.
CA 8.2.6.2	Sangwan, M., Wei, L.	2008	Effect of herbicide metolachlor on brown tide alga *Aureococcus anophagefferens* growth and detoxification.	Abstracts of Papers American Chemical Society, (AUG 17 2008) Vol. 236, pp. 122-ENVR. Meeting Info.: 236th National Meeting of the American-Chemical-Society. Philadelphia, PA, USA. August 17 - 21, 2008. CODEN: ACSRAL. ISSN: 0065-7727.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.6.2	Rea, G., Polticelli, F., Antonacci, A., Scognamiglio, V., Katiyar, P., Kulkarni, S.A., Johanningmeier, U., Giardi, M.T.	2009	Structure-based design of novel *Chlamydomonas reinhardtii* D1-D2 photosynthetic proteins for herbicide monitoring	Protein Science (2009), 18 (10), 2139-2151. CODEN: PRCIEI; ISSN: 1469-896X	Not relevant as atrazine is the subject of the research plus an in-silico evaluation of protein binding is the subject matter.
CA 8.2.6.2	Ishihara, S., Horio, T., Kobara, Y., Yokoyama, A.	2006	Evaluation of herbicide effects on micro algal cells by flow cytometric analysis	Zasso Kenkyu (2006), 51 (4), 239-248. CODEN: ZASKAN; ISSN: 0372-798X	English version of publication unavailable; end; English abstract only available. Translation acquired. Does not fulfil criteria 5 (several doses tested, at least 3, including a negative control, to establish a dose response. Metolachlor was tested with *Pseudokirchneriella subcapitata*, *Achnanthidium minutissimum* (diatom) and *Merismopedia tenuissima* (blue green alga). 72h growth inhibition rate at 10 mg/L is *P. subcapitata*; = 80%; *M. tenuissima*; = <19%; *A. minutissimum*; = 60-70% As the test was conducted only at 10 mg/L no EC_{50} endpoints could be calculated. Therefore this reference is not relevant for this review.
CA 8.2.6.2	Zablotowicz, R.M., Locke, M.A., Lerch, R.N., Knight, S.S.	2004	Dynamics of herbicide concentrations in Mississippi Delta Oxbow Lakes and the role of planktonic microorganisms in herbicide metabolism	ACS Symposium Series (2004), 877 (Water Quality Assessments in the Mississippi Delta), 134-149. CODEN: ACSMC8; ISSN: 0097-6156	Does not fulfil criteria 8 (effects are not related to a single test item). Effects of watershed management and cropping practices were evaluated on the dynamics of herbicide concentrations and planktonic populations. Cotton is cultivated in this area (approx.50% of the area of 3 watersheds). Concentrations of fluometuron, the metabolite desmethyl fluometuron, atrazine and metolachlor were observed. Differences in planktonic populations and activity were observed among the lakes. Therefore the effects relating to metolachlor are not clear, so this reference is not relevant for this review.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.2.7	Brain, R.A., Hoberg, J. Hosmer, A.J., Wall, S.B.	2012	Influence of light intensity on the toxicity of atrazine to the submerged freshwater aquatic macrophyte *Elodea canadensis*	Ecotoxicology and Environmental Safety, (1 May 2012) Vol. 79, pp. 55-61. ISSN: 0147-6513.	Paper focused on atrazine. No data generated on S-metolachlor or metolachlor.
CA 8.2.7	Fulton, B., Brain, R., Brooks, B.	2007	Responses of *Lemna gibba* Exposed to an Equitoxic Mixture of Triclosan and Metolachlor Across a Range of Nitrogen and Phosphorous Ratios.	Conference: 28th Annual Meeting of the Society of Environmental Toxicology and Chemistry North America, Midwest Express Center, Milwaukee, Wisconsin (USA), 11 Nov 2007- 15 Nov 2007. Sponsor(s): The Society of Environmental Toxicology and Chemistry (SETAC)	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.7	Fulton, B., Brain, R.A., Belden, J.B., Brooks, B.W.	2007	Individual and Combined Effects of Triclosan and Metolachlor on *Lemna Gibba*	Conference: 2007 Summer Speciality Conference of the American Water Resources Association (AWRA 2007), Vail Cascade Resort, Vail, Colorado (USA), 25 Feb 2007 - 27 Feb 2007. Sponsor(s): American Water Resources Association	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.2.7 CA 8.6	Cedergreen N., Spliid, N.H., Streibig, J.C.	2004	Species-specific sensitivity of aquatic macrophytes towards two herbicide	Ecotoxicology and Environmental Safety, (Jul 2004) Vol. 58, No. 3, pp. 314-323. ISSN: 0147-6513.	No data generated on S-metolachlor or metolachlor.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.3.1	Genersch, E., von der Ohe, W., Kaatz, H., Schroeder, A., Otten, C., Buechler, R., Berg, S., Ritter, W., Muehlen, W., Gisder, S., Meixner, M., Liebig, G., Rosenkranz, P.	2010	The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies	Apidologie (2010), 41 (3), 332-352. CODEN: APDGB5; ISSN: 0044-8435	Does not fulfil criteria 8 (effects are not related to a single test item). This research involved monitoring bee colonies over a four-year period. Disease, pest and pesticide residues were measured. Metolachlor was found in a small number of pollen samples. As it is difficult to isolate the effects relating solely to metolachlor this reference is not relevant for this review.
CA 8.3.2	Lim, U.T., Mahmoud, A.M.A.	2007	Pesticide susceptibility of *Trissolcus nigripedius* (Hymenoptera:Scelionidae) an egg parasitoid of *Dolycoris baccarum* (Heteroptera:Pentatomidae)	Entomological Research, (AUG 2007) Vol. 37, No. Suppl. 1, pp. A140. Meeting Info.: International Congress of Insect Biotechnology and Industry. Daegu, SOUTH KOREA. August 19-24, 2007. ISSN: 1738-2297.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.3.2	Griggs, J.L., Belden, L.K.	2005	Decreased survival of trematode cercariae *Echinostoma trivolvis* following atrazine and metolachlor exposure.	Integrative and Comparative Biology, (DEC 2005) Vol. 45, No. 6, pp. 1140. Meeting Info.: Annual Meeting of the Society-for-Integrative-and-Comparative-Biology. Orlando, FL, USA. January 04-08, 2006. ISSN: 1540-7063.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.3.2	You, W.-Y., Chen, X.-F., Song, M., Wang, C.-J.	2010	Toxicity Evaluation of Sixteen Herbicides to *Bombyx mori*.	Asian Journal of Ecotoxicology, (FEB 2010) Vol. 5, No. 1, pp. 91-94. ISSN: 1673-5897.	English version of publication unavailable; English abstract available. The acute toxicity of sixteen herbicides to silkworm (*Bombyx mori*) was evaluated in laboratory using food intake method. Results indicated that the 96h LC_{50} of the other thirteen herbicides (*including metolachlor (720 g/L EC formulation)* was higher than 200 mg/kg (mulberry leaf) (i.e. low toxicity substance). The results are difficult to put into context as units are expressed in mg/kg of mulberry leaf. As the silkworm does not appear sensitive; this reference provides nothing to contradict the current regulatory data in terms of toxicity it would be a relevant category of 'c' or 'b' at the best. It has been considered to be none relevant as the units presented cannot be directly compared to the regulatory data or used in the risk assessment.
CA 8.3.2	Liu, H.-J., Zhan, X.-M., Liu, W.	2005	Ecotoxicological difference of chiral pesticides: effects of metolachlor and S-metolachlor on some enzyme activities of silkworm, *Bombyx mori* L.	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2005), 45 (1), 497-500. CODEN: PEACF2; ISSN: 1524-6434	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.4.1	Iordache, M., Borza, I.	2011	Study of the acute toxicity of some Pesticides on earthworms *Eisenia fetida* (Savigny, 1826).	Research Journal of agricultural science, 43(4), pp. 95-100, 15 refs. ISSN: 2066-1843.	Acute exposure and therefore is no longer a data point of relevance. Does not fulfil criteria 8 (effects are not related to a single test item). Gardoprim Plus Gold 500 SC formulation was tested which contains both terbuthylazine and S-metolachlor.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.4	Kamionek, M., Jarmul, J., Pezowicz, E.	2005	Effect of herbicides on *Enchytraeus* sp. (Annelida: Oligochaeta)	Ecological Chemistry and Engineering (2005), 12 (8), 811-816. CODEN: ECECBJ	Does not fulfil criteria 5 (several doses tested, at least 3, including a negative control, to establish a dose response, unless the study design is specifically a limit test. Control must be run concurrently with treatments and mortality to be within the test validity criteria). *Enchytraeus sp.* were sprayed with an unspecified amount of a metolachlor formulation. As there was only 1 test dose and the actual amount used is not clear the data in this paper are considered to be not relevant.
CA 8.4	Kamionek, M., Pezowicz, E., Jarmul, J., Poleszczuk, O.	2005	Effect of herbicides on earthworms *Lumbricus terrestris* L. (Oligochaeta: Lumbricidae)	Ecological Chemistry and Engineering (2005), 12 (10), 1089-1094. CODEN: ECECBJ	Not obtainable at time of submission due to copyright delays. Cannot ascertain if this is relevant.
CA 8.4.1	Xu, D.-M., Xu, X.-L., Liu, W.-L., Liu, W.-P.	2009	Acute toxicity difference of metolachlor and its S-isomer on earthworms	Zhongguo Huanjing Kexue (2009), 29 (9), 1000-1004. CODEN: ZHKEEI; ISSN: 1000-6923	English version of publication unavailable; an English abstract is available. The acute lethal effect of metolachlor and its S-isomer on earthworms with the chiral difference was analysed by using the methods of standard OECD filter paper test, artificial soil test and natural soil test. The acute toxicity of Rac-metolachlor and S-isomer on earthworms in the natural soil test was larger than that in the artificial soil test. There were little differences in LC_{50} of Rac-metolachlor and S-isomer on earthworms, therefore the chiral differences on acute toxicity of earthworms were insignificant. This same group published a similarly named paper 2010 (see Ref ID 75 in Table 9.6-2). It is therefore not considered necessary to translate this paper.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.4.1	Wang, Y., Yu, W., Yang, L., Cang, T., Yu R., Wang, Q., Zhao, X.	2012	Acute Toxicity of Twenty-Two Commonly Used Herbicides to Earthworm (*Eisenia fetida*).	Asian Journal of Ecotoxicology, (JUN 2012) Vol. 7, No. 3, pp. 317-325. ISSN: 1673-5897.	English version of publication unavailable. Abstract only available. The 48-h filter paper contact test for S-metolachlor was moderately toxic to *E. fetida* with an LC_{50} value within the range of 10 (8.3-12) to 35 (29-44) µg/cm^2. The 14-d LC_{50} value (artificial soil) for S-metolachlor was within the range of 107 (84-123) to 5162 (367-1015) mg/kg ~ range for 16 herbicides (all categorised a low toxicity). The latter range in the study from the 14d test is comparable with SYN data where the S-metolachlor EU endpoint is 570 mg/kg. This is in the middle of the stated results range. So the result is either 5 fold below or 2 fold above the SYN endpoint. Either way it is close and indicates low toxicity to earthworms. As acute toxicity to earthworms is not part of the risk assessment framework a closer examination is not considered necessary, and it has been regarded as non-relevant for this review.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.4.1	Liu, W., Xu, D., Liu, H., Liu, G.	2007	Effects of metolachlor on the weight and enzyme activities of earthworms	Huanjing Kexue Xuebao (2007), 27 (12), 2025-2031. CODEN: HKXUDL; ISSN: 0253-2468	English version of publication unavailable; English abstract available. The natural soil test method was used to study the effects of metolachlor on the weight and enzyme activities of earthworms (*Eisenia foetida*). The activities of cellulase, superoxide dismutase (SOD), catalase (CAT), and peroxidase (POD) were measured. The weight and cellulase activity of earthworms were inhibited after exposure to metolachlor. The activities of SOD, CAT, and POD of the earthworm showed different responses to metolachlor, in the sensitivity order CAT > POD > SOD. The weight, cellulase activity, and CAT activity were significantly affected by metolachlor concentration, and all parameters were significantly affected by the duration of exposure. The interaction exposure concentration and duration had significant effects on the activities of CAT and POD but had little effect on the weight and the activities of cellulase and SOD. As the doses cannot be confirmed from the abstract, this has been considered as not relevant for this review. There is ample regulatory and other literary references for this species, none of which indicate that worms would drive the risk assessment.
CA 8.5	Ayansina, A.D.V., Oso, B.A.	2006	Effect of two commonly used herbicides on soil microflora at two different concentrations.	African Journal of Biotechnology (2006) Volume 5, Number 2, pp. 129-132, 10 refs. ISSN: 1684-5615	Does not fulfil criteria 8 (effects are not related to a single test item). Field collected soil was treated with atrazine solo and Primextra (metolachlor + atrazine). Bacterial and fungal counts were conducted for 8 weeks. Effects were related to a mixture of atrazine and metolachlor so therefore this research is not relevant.
CA 8.5	Zhao , S., Arthur, E.L., Moorman, T.B., Coats, J.R.	2005	Evaluation of microbial inoculation and vegetation to enhance the dissipation of atrazine and metolachlor in soil.	Environmental toxicology and chemistry / SETAC, (2005 Oct) Vol. 24, No. 10, pp. 2428-34. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.	Reference focus is on bioremediation. Not relevant to the risk assessment.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.5	Chen, Bo., Xu, D., Wu, J., Liu, G., Liu, W.	2006	Effect of metolachlor on soil microbial numbers in rhizosphere and its degradation	Nongye Huanjing Kexue Xuebao (2006), 25 (4), 898-902. CODEN: NHKXA7; ISSN: 1672-2043	English version of publication unavailable; English abstract available. The effect of metolachlor on microbial nos. and its degradation in celery rhizosphere and non-rhizosphere soil were studied with rhizobag technique. The results showed that bacterial nos. were inhibited by metolachlor initially, but increased after 7 d. Fungi nos. were stimulated by metolachlor, and the higher the metolachlor concentration the greater the influence, which indicated that fungi could utilize metolachlor as carbon and energy sources. The results indicated that degradation of metolachlor was stimulated by plant roots in rhizosphere. Plants and their associated rhizosphere microorganisms could be a good method for bioremediation of soils contaminated with organic pollutants. This is not relevant as the focus is on bioremediation.
CA 8.5	Liu, H, Zhan, X., Liu, W., Liu, H.J., Zhan, X.M., Liu, W.P.	2006	Effect of Rac-metolachlor and S-isomer on soil microbial biomass carbon and nitrogen.	Acta Pedologica Sinica (2006) Volume 43, Number 5, pp. 875-878, 11 refs. ISSN: 0564-3929	English version of publication unavailable; English abstract available which contains no detail. Not an area which drives the risk assessment position therefore this reference has not yet been considered.
CA 8.5	Martins, P.F., Carvalho, G., Gratao, P.L., Dourado, M.N., Pileggi, M., Araujo, W.L., Azevedo, R.A.	2011	Effects of the herbicides acetochlor and metolachlor on antioxidant enzymes in soil bacteria	Process Biochemistry, Vol. 46, no. 5, pp. 1186-1195, May 2011. ISSN: 1359-5113.	Does not fulfil criteria 4 (test organisms are not previously exposed to the test material or other contaminants). Microorganisms were isolated from soil which had been collected from a farm with known history over the previous two years of acetochlor and metolachlor use. This is therefore not relevant for this review.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.5	Martins, P.F., Martinez, C.O., Carvalho, G.de., Carneiro, P.I.B., Azevedo, R.A., Pileggi, S.A.V., Melo, I.S.de., Pileggi, M., de Carvalho, G., de Melo, I.S.	2007	Selection of microorganisms degrading S-metolachlor herbicide.	Brazilian Archives of Biology and Technology (2007) Volume 50, Number 1, pp. 153-159, 27 refs. ISSN: 1516-8913	Focus is on bioremediation hence not relevant.
CA 8.5	Zhou, Y., Liu, W., Wang, T.	2005	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols of Southern China. I. Catalase activity.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2005 May) Vol. 16, No. 5, pp. 895-8. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.	English version of publication unavailable; English abstract available. The effects of 0, 5, 20, and 100 mg/kg metolachlor and S-metolachlor (Dual Gold) were conducted on soil catalase activity. The results showed that 20 mg/kg metolachlor had the most successive stimulating effect; 5 mg/kg metolachlor had an inhibitory effect in the early period, while 100 mg/kg metolachlor had a stimulating effect in the late period. Different concentrations Dual Gold displayed a tendency stimulation-inhibition-stimulation. 5 and 100 mg/kg metolachlor might have more damage on soil ecosystem than different concentrations Dual Gold. The PECs of interest in the dossier are 2.22 mg/kg for the formulation A9396G and 1.92 mg/kg for S-metolachlor. Therefore this study is looking at PECs values much higher than this therefore the results are not relevant for application rates of 1.44 g a.s. /ha.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.5	Zhou, Y., Liu, W., Ye, H.	2006	Effects of pesticides metolachlor and S-metolachlor on soil microorganisms in aquisols. II. Soil respiration.	Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, (2006 Jul) Vol. 17, No. 7, pp. 1305-9. Journal code: 9425159. ISSN: 1001-9332. L-ISSN: 1001-9332.	English version of publication unavailable; English abstract available. Soil microbial respiration was tested at 0, 5, 20, and 100 mg/kg of metolachlor and S-metolachlor (Dual Gold). There was a significant difference in soil microbial respiration between treated and blank soil at the beginning of incubation, but no significant difference was observed during the later period. The PECs of interest in the dossier are 2.22 mg/kg for the formulation A9396G and 1.92 mg/kg for S-metolachlor. Therefore this study is looking at PECs values much higher than this therefore the results are not relevant for application rates of 1.44 g a.s./ha.
CA 8.5	Hou, Y., Xu, J.-Q., Meng, X.-L., Zhang, K., Yang, G.-F.	2013	Effects of nine herbicides on mycelial growth of *Rhizoctonia cerealis*	Mailei Zuowu Xuebao (2013), 33 (6), 1289-1293. CODEN: MZXAAG; ISSN: 1009-1041	English version of publication unavailable; English abstract available. The effects of metolachlor on the mycelial growth of *Rhizoctonia cerealis* were studied. The results showed that metolachlor inhibited mycelial growth and the EC_{50} was 56 mg/L. The amides herbicides changed the colony characteristics. *Rhizoctonia cerealis* is a fungal pathogen of turf so it relevance to corn is not known. The units of inhibition in mg/L are not easily applicable to the risk assessment which would require mg/kg, therefore it has been considered not relevant as there is much data on metolachlor (regulatory and literature which confirms that this area does not drive the risk assessment position.
CA 8.6	Moore, M. T., Krger, R.	2010	Effect of three insecticides and two herbicides on rice (*Oryza sativa*) seedling germination and growth.	Archives of Environmental Contamination and Toxicology (2010) Volume 59, Number 4, pp. 574-581, 53 refs. ISSN: 0090-4341	Does not fulfil criteria 8 (effects are not related to a single test item). Bicep tested (mixture of metolachlor and atrazine).
CA 8.6	Geier, P.W., Stahlman, P.W., Regehr, D.L., Olson, B.L.	2009	Pre-emergence Herbicide Efficacy and Phytotoxicity in Grain Sorghum	Weed technology (2009), Volume 23, Number 2, pp. 197-201. ISSN: 0890-037X	Reference is not relevant as refers to efficacy,

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.6	Whaley, C.M., Armel, G.R., Wilson, H.P., Hines, T.E.	2009	Evaluation of S-Metolachlor and S-Metolachlor Plus Atrazine Mixtures with Mesotrione for Broadleaf Weed Control in Corn	Weed technology (2009), Volume 23, Number 2, pp. 193-196. ISSN: 0890-037X	Does not fulfil criteria 8 (effects are not related to a single test item). Paper evaluates mesotrione efficacy so it is not relevant as have been mixtures tested.
CA 8.6	Bollman, S.L.,; Sprague, . L.	2007	Response of four commercial sugar beet varieties to s-metolachlor and dimethenamid-P.	Proceedings from the biennial meeting (2007), Number 34, 108 p.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.6	Swanton, C.J., Gulden, R.H., Chandler, K.	2007	A Rationale for Atrazine Stewardship in Corn	Weed science (2007), Volume 55, Number 1, pp. 75-81. ISSN: 0043-1745	Reference is not relevant as refers to efficacy.
CA 8.6	Guza, C.J., Stewart, J.F., Hubbell, L.A.	2007	*Beta vulgaris* response to amide herbicides.	Proceedings from the ... biennial meeting (2007), Number 34, 60 p.	Reference is not relevant as refers to efficacy. Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.6	Chindo, P.S., Shebayan, J.A.Y., Marley, P.S.	2010	Effect of pre-emergence herbicides on *Meloidogyne* spp. and *Fusarium* wilt of tomato in Samaru, Zaria, Nigeria.	Journal of Agricultural Research (Lahore) (2010), Volume 48, Number 4, pp. 489-495, 20 refs. ISSN: 0368-1157	Does not fulfil criteria 8 (effects are not related to a single test item). Codal (metolachlor and prometryne) was tested.
CA 8.6	Moore, J.H., Ryder, A., Master, R., Editor(s): Zydenbos, S.M.	2010	Herbicide tolerance of five young perennial grasses.	17th Australasian weeds conference. New frontiers in New Zealand: together we can beat the weeds. Christchurch, New Zealand, 26-30 September, 2010 (2010), pp. 402-405, 3 refs.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.6	Nagy, L. Editor(s): David, I., Koevics, G.J.	2008	Morphological changes of bird seed (*Phalaris canariensis* L.) by the pre-post herbicides treatments.	13. Tiszantuli Noevenyvedelmi Forum, 15-16 October 2008, Debrecen, Hungary (2008), pp. 175-179, 7 refs.	Only an abstract published from a conference; therefore, not peer reviewed and not significantly detailed for assessment.
CA 8.6	Rankova, Z.	2006	Effect of some soil herbicides on the vegetative habits of walnut seedlings (*Juglans regia* L	Acta Agriculturae Serbica (2006), Volume 22, pp. 63-68, 6 refs. ISSN: 0354-9542	Dosing is unclear (150mL/da) and one treatment rate was used. Results therefore cannot be interpreted or compared with Syngenta data.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 8.6	Soltani, N., Bowley, S., Sikkema, P.H.	2005	Responses of black and cranberry beans (Phaseolus vulgaris) to post-emergence herbicides	CROP PROTECTION, (JAN 2005) Vol. 24, No. 1, pp. 15-21. ISSN: 0261-2194.	Not relevant as metolachlor and S-metolachlor were not evaluated.

All documents listed in Table 9.6-2 and not excluded (i.e. not listed in Table 9.6-4) are given below.

Table 9.6-5: List of references which are discussed further (listed by data point number)

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.1.4 CA 8.2.1 CA 8.2.4.1 CA 8.2.4.2	Wan, M. T., Buday, C., Schroeder, G., Kuo, J., Pasternak, J.	2006	Toxicity to *Daphnia magna*, *Hyalella azteca*, *Oncorhynchus kisutch*, *Oncorhynchus mykiss*, *Oncorhynchus tshawytscha* and *Rana catesbeiana* of atrazine, metolachlor, simazine, and their formulated products.	Bulletin of Environmental Contamination and Toxicology (2006) Volume 76, Number 1, pp. 52-58, 9 refs. ISSN: 0007-4861. DOI: 10.1007/s00128-005-0888-4	EU038
CA 8.1.4	Spolyarich N., Hyne, R., Wilson S., Palmer C., Byrne M.	2010	Growth, development and sex ratios of Spotted Marsh Frog (*Limnodynastes tasmaniensis*) larvae exposed to atrazine and a herbicide mixture.	Chemosphere, (2010 Feb) Vol. 78, No. 7, pp. 807-13. Electronic Publication Date: 30 Dec 2009. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.	EU035
CA 8.1.4	Williams, B.K., Semlitsch, R.D.	2010	Larval responses of three Midwestern anurans to chronic, low-dose exposures of four herbicides.	Arch. Environ. Contam. Toxicol. (2010) 58, 819-827.	EU036
CA 8.1.4	Jin, Y., Chen, R., Wang, L., Liu, J., Yang, Y., Zhou, C., Liu, W., Fu, Z	2011	Effects of metolachlor on transcription of thyroid system-related genes in juvenile and adult Japanese medaka (*Oryzias latipes*)	General and Comparative Endocrinology, 170:487-493	EU037
CA8.1.4 CA 8.5	Papaefthimiou, C., Cabral, M. de G., Mixailidou, C., Viegas, C.A., Sa-Correia, I., Theophilidis, G.	2004	Comparison of two screening bioassays, based on the frog sciatic nerve and yeast cells, for the assessment of herbicide toxicity.	Environmental toxicology and chemistry / SETAC, (2004 May) Vol. 23, No. 5, pp. 1211-8. Journal code: 8308958. ISSN: 0730-7268. L-ISSN: 0730-7268.	EU091
CA 8.2	Hayes, T.B., Case, P., Chui, S., Chung D., Haeffele, C., Haston, K., Lee, M., Mai, V.P,., Marjuoa, Y., Parker, J., Tsui, M.	2006	Pesticide mixtures, endocrine disruption, and amphibian declines: are we underestimating the impact?	Environmental health perspectives, (2006 Apr) Vol. 114 Suppl 1, pp. 40-50. Journal code: 0330411. ISSN: 0091-6765. Report No.: NLM-PMC1874187.	EU039
CA 8.2.2.1	Padilla, S., Corum, D., Padnos, B., Hunter, D. L., Beam, A.; Houck, K.A., Sipes, N., Kleinstreuer, N., Knudsen, T., Dix, D.J., Reif, D.M.	2012	Zebrafish developmental screening of the ToxCast Phase I chemical library	Reproductive Toxicology (2012), 33 (2), 174-187. CODEN: REPTED; ISSN: 0890-6238	EU040

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.2.5.1	Liu, H.J., Ye, W.H., Zhan, X.M., Liu, W.P.	2006	A comparative study of rac- and S-metolachlor toxicity to *Daphnia magna*	Ecotoxicology and Environmental Safety (2006) Volume 63, Number 3, pp. 451-455, 25 refs. ISSN: 0147-6513. DOI: 10.1016/j.ecoenv.2005.02.002	EU041
CA 8.2.5.2	Cook, M.E., Moore, P.A.	2008	The effects of the herbicide metolachlor on agonistic behavior in the crayfish, *Orconectes rusticus*.	Archives of environmental contamination and toxicology, (2008 Jul) Vol. 55, No. 1, pp. 94-102. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.	EU042
CA 8.2.5.2	Gagnaire, B., Thomas-Guyon, H., Burgeot, Th., Renault, T.	2006	Pollutant effects on Pacific oyster, *Crassostrea gigas* (Thunberg), hemocytes: Screening of 23 molecules using flow cytometry.	Cell Biology and Toxicology (2006), 22 (1), 1-14. CODEN: CBTOE2; ISSN: 0742-2091	EU043
CA 8.2.5.4	Jin-Clark, Y., Anderson, T.D., Zhu, K.Y.	2008	Effect of alachlor and metolachlor on toxicity of chlorpyrifos and major detoxification enzymes in the aquatic midge, *Chironomus tentans* (Diptera: Chironomidae).	Archives of environmental contamination and toxicology, (2008 May) Vol. 54, No. 4, pp. 645-52. Journal code: 0357245. E-ISSN: 1432-0703. L-ISSN: 0090-4341.	EU044
CA 8.2.5.4	Perez, J., Monteiro, M.S., Quintaneiro C., Soares, A.M.V.M., Loureiro, S.	2013	Characterization of cholinesterases in *Chironomus riparius* and the effects of three herbicides on chlorpyrifos toxicity.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Nov 15) Vol. 144-145, pp. 296-302. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	EU045
CA 8.2.6.1	Fischer, B. B.; Roffler, S.; Eggen, R. I. L.	2012	Multiple stressor effects of predation by rotifers and herbicide pollution on different *Chlamydomonas* strains and potential impacts on population dynamics.	Environmental Toxicology and Chemistry (2012) Volume 31, Number 12, pp. 2832-2840, 43 refs. ISSN: 0730-7268. DOI: 10.1002/etc.2010	EU046
CA 8.2.6.1	Cai, W,-D., Liu H.-J., Fang Z.-G.	2012	Toxicity effects of Rac- and S-metolachlor on two algaes.	Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.], (2012 Feb) Vol. 33, No. 2, pp. 448-53. Journal code: 8405344. ISSN: 0250-3301. L-ISSN: 0250-3301.	EU047
CA 8.2.6.1	Liu, H.J., Cai, W.D., Huang, R.N., Xia, H.L., Wen, Y.Z.	2012	Enantioselective toxicity of metolachlor to *Scenedesmus obliquus* in the presence of cyclodextrins.	Chirality, (2012 Feb) Vol. 24, No. 2, pp. 181-7. Electronic Publication: 2011-12-19. Journal code: 8914261. E-ISSN: 1520-636X. L-ISSN: 0899-0042.	EU048
CA 8.2.6.1	Liu, H., Xiong, M.	2009	Comparative toxicity of racemic metolachlor and S-metolachlor to *Chlorella pyrenoidosa*.	Aquatic toxicology (Amsterdam, Netherlands), (2009 Jun 28) Vol. 93, No. 2-3, pp. 100-6. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	EU049

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.2.6.2	Spoljaric, D., Cipak, A., Horvatic, J., Andrisic, L., Waeg, G., Zarkovic, N., Jaganjac, M.	2011	Endogenous 4-hydroxy-2-nonenal in microalga *Chlorella kessleri* acts as a bioactive indicator of pollution with common herbicides and growth regulating factor of hormesis.	Aquatic toxicology (Amsterdam, Netherlands), (2011 Oct) Vol. 105, No. 3-4, pp. 552-8. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	EU057
CA 8.2.6.1	Vallotton, N., Moser, D., Eggen R.I.L., Junghans, M., Chevre, N.	2008	S-metolachlor pulse exposure on the alga *Scenedesmus vacuolatus*: effects during exposure and the subsequent recovery.	Chemosphere, (2008 Sep) Vol. 73, No. 3, pp. 395-400. Electronic Publication: 2008-07-07. Journal code: 0320657. ISSN: 0045-6535. L-ISSN: 0045-6535.	EU050
CA 8.2.6.1	Deng, L., Senseman, S.A., Gentry, T.J., Zuberer, D.A., Weiss, T.L., Devarenne, T.P., Camargo, E.R.	2012	Effect of selected herbicides on growth and hydrocarbon content of *Botryococcus braunii* (Race B)	Industrial Crops and Products (2012), 39, 154-161. CODEN: ICRDEW; ISSN: 0926-6690	EU051
CA 8.2.6.1	Sbrilli, G., Bimbi, B., Cioni, F., Pagliai, L., Luchi, F., Lanciotti, E.	2005	Surface and ground waters characterization in Tuscany (Italy) by using algal bioassay and pesticide determinations: comparative evaluation of the results and hazard assessment of the pesticides impact on primary productivity	Chemosphere (2005), 58 (5), 571-578. CODEN: CMSHAF; ISSN: 0045-6535	EU052
CA 8.2.6.1	Perez, J., Domingues, I., Soares, A.M.V.M., Loureiro, S.	2011	Growth rate of *Pseudokirchneriella subcapitata* exposed to herbicides found in surface waters in the Alqueva reservoir (Portugal): a bottom-up approach using binary mixtures.	Ecotoxicology (London, England), (2011 Aug) Vol. 20, No. 6, pp. 1167-75. Journal code: 9885956. E-ISSN: 1573-3017. L-ISSN: 0963-9292.	EU053
CA 8.2.6.1	Ma, J., Wang, S., Wang, P., Ma, L., Chen, X., Xu, R.	2006	Toxicity assessment of 40 herbicides to the green alga *Raphidocelis subcapitata*	Ecotoxicology and Environmental Safety (2006), 63 (3), 456-462. CODEN: EESADV; ISSN: 0147-6513	EU054
CA 8.2.6.1 CA 8.2.6.2	Ebenezer, V., Ki, J.-S.	2013	Quantification of toxic effects of the herbicide metolachlor on marine microalgae *Ditylum brightwellii* (Bacillariophyceae), *Prorocentrum minimum* (Dinophyceae), and *Tetraselmis suecica* (Chlorophyceae).	Journal of microbiology (Seoul, Korea), (2013 Feb) Vol. 51, No. 1, pp. 136-9. Journal code: 9703165. E-ISSN: 1976-3794. L-ISSN: 1225-8873.	EU055
CA 8.2.6.1 CA 8.2.6.2	Thakkar, M., Randhawa, V., Wei, L.	2013	Comparative responses of two species of marine phytoplankton to metolachlor exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2013 Jan 15) Vol. 126, pp. 198-206. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X.	EU056
CA 8.2.6.2	Fiori E., Pistocchi R.	2014	*Skeletonema marinoi* (Bacillariophyceae) sensitivity to herbicides and effects of temperature increase on cellular responses to terbuthylazine exposure.	Aquatic toxicology (Amsterdam, Netherlands), (2014 Feb) Vol. 147, pp. 112-20. Journal code: 8500246. E-ISSN: 1879-1514. L-ISSN: 0166-445X	EU058

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.2.6.2	Larras, F., Bouchez, A., Rimet, F., Montuelle, B.	2012	Using bioassays and species sensitivity distributions to assess herbicide toxicity towards benthic diatoms.	PloS one, (2012) Vol. 7, No. 8, pp. e44458. Electronic Publication: 2012-08-30.	EU059
CA 8.2.6.2	Larras, F., Montuelle, B., Bouchez, A.	2013	Assessment of toxicity thresholds in aquatic environments: does benthic growth of diatoms affect their exposure and sensitivity to herbicides?	The Science of the total environment, (2013 Oct 1) Vol. 463-464, pp. 469-77. Journal code: 0330500. E-ISSN: 1879-1026. L-ISSN: 0048-9697.	EU060
CA 8.3.1	Helmer, S.H., Kerbaol, A., Aras, P., Jumarie, C., Boily, M.	2014	Effects of realistic doses of atrazine, metolachlor, and glyphosate on lipid peroxidation and diet-derived antioxidants in caged honey bees (*Apis mellifera*).	Environmental science and pollution research international, (2014 Apr 15) Journal code: 9441769. E-ISSN: 1614-7499. L-ISSN: 0944-1344.	EU061
CA 8.3.1	Zhan, X., Liu, H., Miao, Y., Liu, W., Zhan, X.M., Liu, H.J., Miao, Y.G., Liu, W.P.	2006	A comparative study of rac- and S-metolachlor on some activities and metabolism of silkworm, *Bombyx mori* L.	Pesticide Biochemistry and Physiology (2006) Volume 85, Number 3, pp. 133-138, 33 refs. ISSN: 0048-3575. DOI: 10.1016/j.pestbp.2005.12.003	EU062
CA 8.3.2	Carmo, E.L., Bueno, A.F., Bueno, R.C.O.F.	2010	Pesticide selectivity for the insect egg parasitoid *Telenomus remus*.	BioControl (2010) Volume 55, Number 4, pp. 455-464, 38 refs. ISSN: 1386-6141	EU063
CA 8.3.2	Xu H., Xue, M., Zhao, H., Ma, X., Liu, Y., Xu, H.Q., Xue, M., Zhao, H.P., Ma, X.D., Liu, Y.Y.	2013	Analysis and evaluation of eight herbicides toxicity and sensitivity against two *Trichogramma* spp.	Journal of Food, Agriculture & Environment (2013), Volume 11, Number 3/4, pp. 855-858, 19 refs. ISSN: 1459-0255	EU064
CA 8.4	Park, E.-K., Lees, E.M.	2005	Application of an artificial sea salt solution to determine acute toxicity of herbicides to *Proisotoma minuta* (Collembola).	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2005) Vol. 40, No. 4, pp. 595-604. Journal code: 7607167. ISSN: 0360-1234. L-ISSN: 0360-1234.	EU065
CA 8.4	Wang, Y., Wu, S., Chen, L., Wu, C., Yu, R., Wang, Q., Zhao, X.	2012	Toxicity assessment of 45 pesticides to the epigeic earthworm *Eisenia fetida*.	Chemosphere, (July 2012) Vol. 88, No. 4, pp. 484-491. Refs: 63. ISSN: 0045-6535; E-ISSN: 1879-1298. CODEN: CMSHAF	EU066
CA 8.4	Xu, D., Wen, Y., Wang, K.	2010	Effect of chiral differences of metolachlor and its (S)-isomer on their toxicity to earthworms.	Ecotoxicology and environmental safety, (2010 Nov) Vol. 73, No. 8, pp. 1925-31. Journal code: 7805381. E-ISSN: 1090-2414. L-ISSN: 0147-6513.	EU067
CA 8.4	Stepic, S., Hackenberger, B.K., Velki, M., Hackenberger, D.K., Loncaric, Z.	2013	Potentiation effect of metolachlor on toxicity of organochlorine and organophosphate insecticides in earthworm *Eisenia andrei*.	Bulletin of environmental contamination and toxicology, (2013 Jul) Vol. 91, No. 1, pp. 55-61. Journal code: 0046021. E-ISSN: 1432-0800. L-ISSN: 0007-4861.	EU068

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.4 CA 8.6	Kondras, M., Czepinska-Kaminska, D., Karczewska, J., Wojewoda, K.	2011	The influence of two pesticides in soils on selected plants and earthworms	Roczniki Gleboznawcze (2011), 62 (2), 219-225. CODEN: ROGLAA; ISSN: 0080-3642	EU070
CA 8.4	Aly, M.A.S., Schroder, P.	2008	Effect of herbicides on glutathione S-transferases in the earthworm, *Eisenia fetida*.	Environmental science and pollution research international, (2008 Mar) Vol. 15, No. 2, pp. 143-9. Journal code: 9441769. ISSN: 0944-1344.	EU069
CA 8.5	Joly, P., Besse-Hoggan, P., Bonnemoy, F., Batisson, I., Bohatier, J., Mallet, C.	2012	Impact of maize formulated herbicides Mesotrione and S-metolachlor, applied alone and in mixture, on soil microbial communities	ISRN Ecology, (2012) pp. 329898, 9 pp. CODEN: IESCCC. ISSN: 2090-4614.	EU071
CA 8.5	Joly, P., Bonnemoy, F., Charvy, J.-C., Bohatier, J., Mallet, C.	2013	Toxicity assessment of the maize herbicides S-metolachlor, benoxacor, mesotrione and nicosulfuron, and their corresponding commercial formulations, alone and in mixtures, using the Microtox(®) test.	Chemosphere, (2013 Nov) Vol. 93, No. 10, pp. 2444-50. Electronic Publication Date: 26 Sep 2013. Journal code: 0320657. E-ISSN: 1879-1298. L-ISSN: 0045-6535.	EU072
CA 8.5	Joly, P., Misson, B., Perriere, F. Bonneymoy, F. Joly, M. Bernard, F., Aguer, J-P., Bohatier, J., Mallet, C., Donnadieu-	2014	Soil surface colonisation by phototrophic indigenous organisms, in two contrasted soils treated by formulated maize herbicide mixtures	Ecotoxicology (London, England) (2014 Aug 18). Journal code 9885956. E-ISSN:1573-3017. L-ISSN: 0963-9292	EU073
CA 8.5	Lipsa, F.D., Ulea, E., Chiriac, I.P., Coroi, I.G.	2010	Effect of herbicide S-metolachlor on soil microorganisms.	Lucrari Stiintifice, Universitatea de Stiinte Agricole Si Medicina Veterinara "Ion Ionescu de la Brad" Iasi, Seria Agronomie (2010) Volume 53, Number 2, pp. 110-113, 11 refs. ISSN: 1454-7414	EU074
CA 8.5	Vodovnik, M., Bistan, M., Zorec, M., Marinsek-Logar, R.	2012	Membrane Changes Associated with Exposure of *Pseudomonas putida* to Selected Environmental Pollutants and their Possible Roles in Toxicity.	Acta chimica Slovenica, (2012 Mar) Vol. 59, No. 1, pp. 83-8. Journal code: 101247110. ISSN: 1318-0207. L-ISSN: 1318-0207.	EU075
CA 8.5	Kos, K., Celar, F.A.	2013	Sensitivity of the entomopathogenic fungus *Beauveria bassiana* (Bals.-Criv.) Vuill. to selected herbicides.	Pest Management Science (2013), Volume 69, Number 6, pp. 717-721, 34 refs. ISSN: 1526-498X	EU076
CA 8.6	Sikkema, P.H., Shropshire, C., Soltani, N.	2009	Response of dry bean to pre-plant incorporated and pre-emergence applications of S-metolachlor and fomesafen	Crop protection (2009), Volume 28, Number 9, pp. 744-748. ISSN: 0261-2194	EU077
CA 8.6	Samtani, J.B., Masiunas, J.B., Applyby, J.E.	2010	White Oak and Northern Red Oak Leaf Injury from Exposure to Chloroacetanilide Herbicides.	HortScience : a publication of the American Society for Horticultural Science (2010), Volume 45, Number 4, pp. 696-700. ISSN: 0018-5345	EU078

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.6	Sikkema, P.H., Soltani, N., Shropshire, C., Robinson, D.E.	2006	Response of adzuki bean to pre-emergence herbicides.	Canadian journal of plant science = Revue Canadienne de phytotechnie (2006), Volume 86, Number 2, pp. 601-604. ISSN: 0008-4220	EU079
CA 8.6	Boutin, C., Elmegaard, N., Kjaer, C.	2004	Toxicity testing of fifteen non-crop plant species with six herbicides in a greenhouse experiment: Implications for risk assessment.	Ecotoxicology, (May 2004) Vol. 13, No. 4, pp. 349-369. ISSN: 0963-9292.	EU080
CA 8.6	Bollman, S.L., Sprague, C.L.	2008	Tolerance of 12 Sugarbeet Varieties to Applications of S-metolachlor and Dimethenamid-P	Weed technology (2008), Volume 22, Number 4, pp. 699-706. ISSN: 0890-037X Source Note: 2008 Oct., v. 22, no. 4	EU081
CA 8.6	Xie, F., Liu, H.J., Cai, W.D., Xie, F.	2010	Enantioselectivity of racemic metolachlor and S-metolachlor in maize seedlings	Journal of Environmental Science and Health. Part B, Pesticides, Food Contaminants, and Agricultural Wastes (2010), Volume 45, Number 8, pp. 774-782, 33 refs. ISSN: 0360-1234	EU082
CA 8.6	Samtani, J.B., Masiunas, J.B., Appleby, J.E.	2008	Injury on white oak seedlings from herbicide exposure simulating drift.	HortScience (2008), Vol. 43, Number 7, pp. 2076-2080, 27 refs. ISSN: 0018-5345	EU083
CA 8.6	Yadav, P.K., Khan, A.H., Amar, N., Yadav, S.K.S., Nath, A.	2007	Effect of herbicides on biochemical and growth parameters of chickpea (*Cicer arietinum* L.).	Research on Crops (2007), Vol. 8, Number 2, pp. 388-390, 8 refs. ISSN: 0972-3226	EU084
CA 8.6	Yadav, P.K., Khan, A.H., Murti, R., Upadhyay, R.K.	2006	Effect of herbicides on germination, growth and nodulation in chickpea (*Cicer arietinum*)	Indian Journal of Agricultural Sciences (2006), 76 (11), 682-684	EU085
CA 8.6	Norsworthy, J.K., Smith, J.P., Meister, C.	2007	Tolerance of direct-seeded green onions to herbicides applied before or after crop emergence.	Weed Technology (2007), Volume 21, Number 1, pp. 119-123. ISSN: 0890-037X	EU086
CA 8.6	Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	White bean sensitivity to preemergence herbicides.	Weed Technology (2004), Vol. 18, Number 3, pp. 675-679, 15 refs. ISSN: 0890-037X	EU087
CA 8.6	Neugebauerova, J., Petrikova, K.	2004	Possibilities of pre-emergence and post-emergence herbicide applications in *Prunella vulgaris* L. growth.	Zahradnictvi (Horticultural Science) (2004), Volume 31, Number 3, pp. 115-118, 13 refs. ISSN: 0862-867X	EU088
CA 8.6	Soltani, N., Shropshire, C., Cowan, T., Sikkema, P.	2004	Tolerance of black beans (*Phaseolus vulgaris*) to soil applications of S-metolachlor and imazethapyr.	Weed Technology (2004), Volume 18, Number 1, pp. 111-118, 25 refs. ISSN: 0890-037X	EU089
CA 8.6	De Marez, T., Mechant, E., Goossens, V., Bulcke, R.	2007	Effect of selected sugar beet herbicides on germination of various *Chenopodium album* populations.	Communications in agricultural and applied biological sciences, (2007) Vol. 72, No. 2, pp. 265-9. Journal code: 101200320. ISSN: 1379-1176. L-ISSN: 1379-1176.	EU090

S-Metolachlor

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

DOCUMENT M-CA, Section 9

Fate and Behaviour in the Environment

LITERATURE DATA

Version history[1]

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

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for S-metolachlor, relevant metabolite(s) and EU representative formulation A9396G (Dual Gold®).

CA 9.2 Author(s) of the review

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

This report summarises the search for scientific peer-reviewed open literature on physical and chemical properties "on the active substance S-metolachlor and its relevant metabolites(s) dealing with side-effects on health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The search strategy is detailed in the tables below. In summary, initially a very broad search was done to look for any references which included the active substance S-metolachlor, or its major metabolites, or its representative formulation, in conjunction with any of the key words set out in Table 9.5-1. The names searched for were:

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L1      QUE  (693288-41-4 OR 131068-72-9 OR 1217465-10-5 OR 244270-80-2)
L2      QUE  (244270-82-4 OR 887649-86-7 OR 244270-79-9 OR 244270-81-3)
L3      QUE  (887649-85-6 OR 947601-85-6 OR 446027-17-4 OR 1173021-76-5)
L4      QUE  (1418095-19-8 OR 126605-22-9 OR 153516-68-8 OR 61520-53-4)
L5      QUE  (82508-08-5 OR 82508-09-6 OR 61520-54-5 OR 97055-05-5)
L6      QUE  (32428-71-0 OR 97055-06-6 OR 52559-52-1 OR 51219-00-2)
L7      QUE  (96394-97-7 OR 121073-75-4 OR 170379-74-5 OR 152019-73-3)
L8      QUE  (120375-14-6 OR 65513-61-3 OR 159956-64-6 OR 171118-09-5)
L9      QUE  (CGA098847 OR CGA98847 OR CGA46129 OR CGA138868)
L10     QUE  (CGA354743 OR CGA41507 OR CGA51202 OR CGA40172)
L11     QUE  (CGA40919 OR CGA37735 OR CGA49751 OR CGA37913)
L12     QUE  (CGA351915 OR CGA133275 OR CGA046129 OR CGA13656)
L13     QUE  (CGA(2W)(098847 OR 98847 OR 46129 OR 138868))
L14     QUE  (CGA(2W)(354743 OR 41507 OR 51202 OR 40172))
L15     QUE  (CGA(2W)(40919 OR 37735 OR 49751 OR 37913))
L16     QUE  (CGA(2W)(351915 OR 133275 OR 046129 OR 13656))
L17     QUE  (SYN542491 OR SYN542489 OR SYN542492 OR SYN547969)
L18     QUE  (SYN542488 OR SYN542490 OR SYN542607 OR NOA436611)
L19     QUE  (SYN(2W)(542491 OR 542489 OR 542492 OR 547969))
L20     QUE  ((SYN(2W)(542488 OR 542490 OR 542607)) OR (NOA(2W)436611))
L21     QUE  (55762-76-0 OR 63150-68-5 OR 94449-58-8 OR (CGA(W)77102))
L22     QUE  (METETILACHLOR OR METOLACHLOR OR (CGA(W)24705) OR CGA24705)
L23     QUE  ((S OR ALPHA)(2W)(METOLACHLOR OR METHOLACHLOR))
L24     QUE  (CGA77102 OR 51218-45-2 OR 87392-12-9 OR METHOLACHLOR)
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L25     QUE  (L1-L20)   METABOLITES
L26     QUE  (L21 OR L22 OR L23 OR L24)   METOLACHLOR
L27     QUE  (L25 OR L26)   METOLACHLOR & METABOLITES
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An overview of the results is summarised in the table below and further details are provided in Section 9.5.

Data requirement(s) captured in the search	**Number (Initial Search)**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	4281
Number of *summary records* excluded from the search results after rapid assessment for relevance	4230
Total number of *full-text* documents assessed in detail*	51
Number of *studies* excluded from further consideration after detailed assessment for relevance	50
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	1

*both from bibliographic databases and other sources of peer-reviewed literature

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

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

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

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

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

	11. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 12. Identification of 'new' metabolites is robust with appropriate details of method used 13. Anaerobic conditions are verified by measurement
Route and rate of degradation in soil – Field Studies CA 7.1.2.2	1. In addition to criteria under laboratory route and rate: 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate weather data available to verify relevance of study 4. Application technique relevant to proposed use (foliar, ST granule etc) 5. Sufficient sampling detail and description of sample handling prior to analysis 6. Initial and procedural recoveries are adequate to support the conclusions, e.g. 70-120%.
Soil photolysis CA 7.1.1.3	In addition to criteria under laboratory route and rate: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Mobility studies Adsorption, desorption – parent and metabolites CA 7.1.3 Column or TLC leaching CA 7.1.4.1.1, CA 7.1.4.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 106) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols 6. Application rate is appropriate to the proposed use and can be verified from the data 7. Sufficient number of samples taken to determine isotherm (if done) 8. Stability of the test item in the system was demonstrated 9. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Analytical method well described, LOD/LOQ at appropriate level 12. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Lysimeter studies CA 7.1.4.2	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data available to verify relevance of study. Combined rainfall/irrigation sufficient to meet guideline requirements 3. Minimum 1 m depth soil monolith 4. Study continued for sufficient years to support the conclusions
Field leaching CA 7.1.4.3.	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data and groundwater data (depth, direction) available to verify the validity of study 3. Installation and operation of lysimeters and/or wells and samplers follows recommended protocols 4. Study continued for sufficient years to support the conclusions

Hydrolysis CA 7.2.1	1. Well defined test material (including purity/content) 2. Experimental conditions should not differ significantly from recommended protocols 3. Application rate is within an acceptable the range (e.g. consider solubility) and can be verified from the data (time zero samples) 4. Sufficient number of samples taken to determine kinetics (minimum 5) 5. Analytical method well described, LOD/LOQ at appropriate level 6. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 7. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 8. Identification of 'new' metabolites is robust with appropriate details of method used
Aqueous photolysis CA 7.2.1.2	In addition to criteria under hydrolysis: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Degradation in aquatic systems CA 7.2.2	1. Well defined test material (including purity/content) 2. Water(s) and sediment(s) must be from an agricultural area and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 308) 3. Water/sediment collection, preparation and storage do not differ significantly from recommended protocols 4. Experimental conditions do not differ significantly from recommended protocols e.g. temperature and aeration 5. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 6. Sufficient number of samples taken to determine kinetics (minimum 5) 7. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 8. Analytical method well described, LOD/LOQ at appropriate level 9. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Identification of 'new' metabolites is robust with appropriate details of method used 12. Anaerobic conditions are verified by measurement
Degradation in the saturated zone CA 7.2.3	1. For laboratory studies refer to criteria under laboratory route and rate 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate site characterisation data available e.g. soils, geology, hydrology 4. Installation of samplers e.g. wells, lysimeters follows recommended protocols 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Route and rate of degradation in air CA 7.3.1	1. Experimental conditions or calculations differ significantly from recommended protocols 2. Analytical method well described, LOD/LOQ at appropriate level 3. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included

Monitoring CA 7.5	1. Site(s) or areas must be geoclimatically relevant for the EU 2. Adequate site characterisation data available e.g. soils, geology, hydrology 3. Installation of samplers e.g. wells, lysimeters follows recommended protocols OR adequate description of wells is available (depth of well, length of screen, depth of screen opening, depth of groundwater) 4. Appropriate sampling methodology. 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. suitable blank controls included 7. For surface water: description of sampling methodology and handling of detects (peaks, interpolated time-step?), linked to rainfall intensity and volume). Discharge volumes, catchment drained area.

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

CA 9.5 Search methods

Date of initial search	22.08.2014
Date of most recent update to search	-
Date span of the search	10 years

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

Search Strategy		
L1	QUE	(693288-41-4 OR 131068-72-9 OR 1217465-10-5 OR 244270-80-2)
L2	QUE	(244270-82-4 OR 887649-86-7 OR 244270-79-9 OR 244270-81-3)
L3	QUE	(887649-85-6 OR 947601-85-6 OR 446027-17-4 OR 1173021-76-5)
L4	QUE	(1418095-19-8 OR 126605-22-9 OR 153516-68-8 OR 61520-53-4)
L5	QUE	(82508-08-5 OR 82508-09-6 OR 61520-54-5 OR 97055-05-5)
L6	QUE	(32428-71-0 OR 97055-06-6 OR 52559-52-1 OR 51219-00-2)
L7	QUE	(96394-97-7 OR 121073-75-4 OR 170379-74-5 OR 152019-73-3)
L8	QUE	(120375-14-6 OR 65513-61-3 OR 159956-64-6 OR 171118-09-5)
L9	QUE	(CGA098847 OR CGA98847 OR CGA46129 OR CGA138868)
L10	QUE	(CGA354743 OR CGA41507 OR CGA51202 OR CGA40172)
L11	QUE	(CGA40919 OR CGA37735 OR CGA49751 OR CGA37913)
L12	QUE	(CGA351915 OR CGA133275 OR CGA046129 OR CGA13656)
L13	QUE	(CGA(2W)(098847 OR 98847 OR 46129 OR 138868))
L14	QUE	(CGA(2W)(354743 OR 41507 OR 51202 OR 40172))
L15	QUE	(CGA(2W)(40919 OR 37735 OR 49751 OR 37913))
L16	QUE	(CGA(2W)(351915 OR 133275 OR 046129 OR 13656))
L17	QUE	(SYN542491 OR SYN542489 OR SYN542492 OR SYN547969)
L18	QUE	(SYN542488 OR SYN542490 OR SYN542607 OR NOA436611)
L19	QUE	(SYN(2W)(542491 OR 542489 OR 542492 OR 547969))
L20	QUE	((SYN(2W)(542488 OR 542490 OR 542607)) OR (NOA(2W)436611))
L21	QUE	(55762-76-0 OR 63150-68-5 OR 94449-58-8 OR (CGA(W)77102))
L22	QUE	(METETILACHLOR OR METOLACHLOR OR (CGA(W)24705) OR CGA24705)
L23	QUE	((S OR ALPHA)(2W)(METOLACHLOR OR METHOLACHLOR))
L24	QUE	(CGA77102 OR 51218-45-2 OR 87392-12-9 OR METHOLACHLOR)
L25	QUE	(L1-L20) METABOLITES
L26	QUE	(L21 OR L22 OR L23 OR L24) METOLACHLOR
L27	QUE	(L25 OR L26) METOLACHLOR & METABOLITES

Plus

Search Strategy

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L1      QUE  (FATE# OR DEGRAD? OR PERSIST? OR DECOMP? OR DECAY?)
L2      QUE  (TRANSFORM? OR DETERIORAT? OR METAB? OR DEGENERAT?)
L3      QUE  (BIODEGRAD? OR BIOTRANSFORM? OR BIODETERIORAT?)
L4      QUE  (BIODEGENERAT? OR BREAKDOWN? OR BREAKSDOWN?)
L5      QUE  (((BROKEN? OR BREAK?)(W)(UP OR DOWN)) OR HALFLIFE#)
L6      QUE  (HALFLIVES OR HALF(W)(LIFE OR LIVES) OR DEGRDN# OR DECOMPN#)
L7      QUE  (BIODEGRDN# OR DEGN# OR BIODEGN# OR DISSIP? OR RESIDUE?)
L8      QUE  (LEACH? OR TRANSPORT? OR MOBIL? OR MOVEMENT? OR HYDROLY?)
L9      QUE  (ADSORP? OR ADSORB? OR SORP? OR SORB? OR DESORP?)
L10     QUE  (DESORB? OR RUNOFF OR (RUN#(W)OFF) OR DRAIN? OR PERCOLAT?)
L11     QUE  (WASHOFF? OR WASHOUT? OR (WASH?(W)(OUT OR OFF)))
L12     QUE  ((((OFF(W)TARGET) OR LATERAL OR HORIZONTAL)(3W)MOVE?))
L13     QUE  (PHOTOLY? OR PHOTODEGRAD? OR PHOTODECOMP?)
L14     QUE  (PHOTOTRANSFORM? OR PHOTOSTAB? OR PHOTODEGRDN# OR PHOTODEGN#)
L15     QUE  ((PHOTO(W)(DECOMP? OR DEGRAD? OR TRANSFORM? OR STAB? OR
              CHEM?)))
L16     QUE  (PHOTOCHEM? OR VOLATIL? OR VAPOUR? OR VAPOR? OR DT50 OR DT90)
L17     QUE  ((DT(W)50) OR (DT(W)90) OR KDOC OR (K(W)DOC) OR KD OR KOC)
L18     QUE  ((K(W)OC) OR (PARTITION?(3W)COEFF?) OR FREUNDLICH)
L19     QUE  (SEDIMENT? OR SOIL OR SOILS OR PODZOL? OR CLAY? OR SAND?)
L20     QUE  (SILT? OR CHERNOZEM? OR PODSOL? OR LOAM? OR PEAT?)
L21     QUE  ((ORGANIC(2W)MATTER?) OR MONTMORIL? OR LATOSOL? OR HUMIC?)
L22     QUE  (HUMUS? OR SUBSOIL? OR AIR OR WATER? OR ATMOSPHER?)
L23     QUE  (RAIN### OR RAINWATER? OR RAINFALL? OR LEACH?)
L24     QUE  (GROUNDWATER? OR ENVIRONMENT? OR PRECIPITAT? OR POND#)
L25     QUE  (STREAM# OR RIVER# OR DELTA# OR ESTUAR? OR SEDIMENT?)
L26     QUE  (AQUATIC? OR MARINE? OR TIDAL? OR BENTHIC? OR LAKE#)
L27     QUE  (BENTHOS? OR LIMNO? OR FRESHWATER? OR SEAWATER?)
L28     QUE  (SALTWATER? OR ((GROUND? OR FRESH OR SEA OR SALT)(W)WATER?))
L29     QUE  (LACUSTRINE? OR MIRE OR MIRES OR RESERVOIR# OR CANAL#)
L30     QUE  (LOCH# OR SEA OR OCEAN OR OCEANS OR LAGOON? OR SEAS)
L31     QUE  (SEABED OR SEAFLOOR OR INTERTIDAL? OR SHORE? OR COAST?)
L32     QUE  (BRACKISH OR LITTORAL? OR SEASHORE? OR MEIOBENTH?)
L33     QUE  (MICROBENTH? OR MACROBENTH? OR HARBOUR# OR FLUVIAL?)
L34     QUE  (MARSH? OR BOG OR BOGS OR SWAMP? OR FEN OR FENS OR ALLUVI?)
L35     QUE  (MUDFLAT? OR (MUD(W)FLAT?) OR BAY OR BAYS OR CREEK#)
L36     QUE  (HYDROSOIL# OR (HYDRO(W)SOIL#) OR MESOCOSM? OR MICROCOSM?)
L37     QUE  (WETLAND? OR FENLAND? OR ((WET OR FEN)(W)LAND?))
L38     QUE  (WATERWAY? OR WATERSHED? OR (WATER(W)(WAY? OR SHED?)))
L39     QUE  (CATCHMENT? OR DITCH? OR DRAIN# OR DRAINAG?)
L40     QUE  (((FOLIAGE OR FOLIAR OR LEAF OR LEAVES)(5A)EVAPORAT?))
L41     QUE  ((SPRAY? OR DUST?)(3A)DRIFT)
L42     QUE  (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10
            OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19
            OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28
            OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37
            OR L38 OR L39 OR L40 OR L41)
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Table 9.5-2: Detailed Search Parameters for Fate and behaviour in the environment (CA 7.1 to 7.12)

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	604
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		165
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily.		
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		16
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		59
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		246
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		834

Provider	Database	Justification	Limits applied	Number*
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		1779
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		9
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly.		
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		119
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		181
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly		28

Provider	Database	Justification	Limits applied	Number*
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		332
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		16

* Total number of summary records retrieved after removing duplicates

Table 9.5-3: Detailed Search Parameters for Web searches

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

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

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

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

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

Table 9.5-5: Detailed Search Parameters for Reference Lists

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

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

CA 9.6 Results

Table 9.6-1: Results of study selection process

Data requirement(s) captured in the search	Number (Initial Search)
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	4281
Number of *summary records* excluded from the search results after rapid assessment for relevance	4230
Total number of *full-text* documents assessed in detail	51
Number of *studies* excluded from further consideration after detailed assessment for relevance	50
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	1

*both from bibliographic databases and other sources of peer-reviewed literature

Applicant has additionally reviewed two publications on the degradation of S-metolachlor in water/sediment systems (Rice *et al*., 2004 and Mersie *et al*., 2004) as outlined in Stop the Clock request 60.

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

CA data point number	Author(s)	Year	Title	Source
Initial search				
7.1.1.1	Klein, C, Schneider, RJ, Meter, MT & Aga, DS	2006	Enantiomeric separation of metolachlor and its metabolites using LC-MS and CZE	Chemosphere, 62, 1591-1599
7.1.1.1	Polcaro CM, Berti A; Mannina, L; Marra C; Sinibaldi M; Viel S	2007	Chiral HPLC resolution of neutral pesticides	Journal of Liquid Chromatography & Related Technologies, 27:1,49-61
7.1.1.1	Accinelli, C.; Dinelli, G.; Vicari, A.	2004	Metolachlor and linuron soil degradation after repeated applications under laboratory conditions.	Agrochimica (2004), Vol. 48, Number 3/4, pp. 132-140
7.1.1.1	Capel, Paul D.; Webb, Richard M. T.	2007	Multi-compartment analysis of the behavior and fate of metolachlor in the environment	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2007), 47(2), 593-595
7.1.1.1	Vryzas Zisis	2012	Biotransformation of atrazine and metolachlor within soil profile and changes in microbial communities.	Chemosphere, (2012 Nov) Vol. 89, No. 11, pp. 1330-8
7.1.1.1	Cao P, Wang X, Liu F, Zhao E & Han L	2008	Dissipation and Residue of S-Metolachlor in Maize and Soil	Bull Environ Contam Toxicol, Vol 80, pp. 391-394
7.1.1.1	Shaner, D L; Brunk, G; Belles, D; Westra, P; Nissen, S	2006	Soil dissipation and biological activity of metolachlor and S-metolachlor in five soils	Pest management science (2006), Volume 62, Number 7, pp. 617-623
7.1.4	Vryzas Z; Papadakis EN; Papadopoulou-Mourkidou E	2012	Leaching of Br-, metolachlor, alachlor, atrazine, deethylatrazine and deisopropylatrazine in clayey vadoze zone: a field scale experiment in north-east Greece.	Water research, (2012 Apr 15) Vol. 46, No. 6, pp. 1979-89

CA data point number	Author(s)	Year	Title	Source
7.1.4	Barra CA; Giuliano G; Grenni P; Guzzella L; Pozzoni F; Bottoni P; Fava L; Crobe A; Orru M; Funari E	2005	Degradation and leaching of the herbicides metolachlor and diuron: a case study in an area of Northern Italy.	Environmental pollution (Barking, Essex : 1987), (2005 Apr) Vol. 134, No.3, pp. 525-34.
7.1.4	Doppler, T.; Camenzuli, L.; Hirzel, G.; Krauss, M.; Luck, A.; Stamm, C.	2012	Spatial variability of herbicide mobilization and transport at catchment scale: insights from a field experiment	Hydrology and Earth System Sciences (2012), 16 (7), 1947-1967
7.2.1.2	Coffinet, S.; Rifai, A.; Genty, C.; Souissi, Y.; Bourcier, S.; Sablier, M.; Bouchonnet, S.	2012	Characterization of the photodegradation products of metolachlor: structural elucidation, potential toxicity and persistence	Journal of Mass Spectrometry , Volume 47, Number 12, pp. 1582-1593
7.2.1.2	Souissi Y, Bouchonnet S, Bourcier S, Kusk KO, Sbalier M & Andersen HR	2013	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water	Science of the Total Environment 458-460, 527-534
7.2.2	Kurt-Karakus PH, Bidleman, TF, Muir, DCG, Struger J, Sverko E, Cagampan SJ, Small JM and Jantunen LM	2010	Comparison of concentrations and stereoisomer ratios of mecoprop, dichlorprop and metolachlor in Ontario streams, 2006-2007 vs. 2003-2004	Environmental Pollution, 158, 1842-1849
7.2.2	Aboul Eish, MYZ; Wells, MJM	2008	Monitoring stereoselective degradation of metolachlor in a constructed wetland: use of statistically valid enantiomeric and diastereomeric fractions as opposed to ratios.	Journal of chromatographic science, (2008 Mar) Vol. 46, No. 3, pp. 269-75.
7.2.2	Rice PJ, Anderson TA & Coats JR	2004	Effect of sediment on the fate of metolachlor and atrazine in surface water	Environ. Toxicol. Chem 23(5); 1145-55
7.2.2.	Mersie W, McNamee C, Seybold C & Tierney D	2004	Degradation of metolachlor in bare and vegetated soils and in simulated water-sediment systems	Environ Toxicol Chem 23(11), 2627-2632
7.3.2	Gish, TJ; Prueger, JH; Daughtry, CST; Kustas, WP; McKee, LG; Russ, AL; Hatfield, JL	2011	Comparison of field-scale herbicide runoff and volatilization losses: an eight-year field investigation. Journal of environmental quality	Journal of environmental quality, Vol. 40, No. 5, pp.1432-42
7.5	Amalric L, Baran N, Coureau C, Maingot L, Buron F & Routier S	2013	Analytical developments for 47 pesticides: first identification of neutral chloroacetanilide derivatives in French groundwater	Inter. J. Environ. Anal. Chem. 93(15), 1660-1675
7.5	Baran N & Gourcy L	2013	Soprtion and mineralisation of S-metolachlor and its ionic metabolites in soils and vadose zone solids: Consequences on groundwater quality in an alluvial aquifer (Ain Plain, France)	Journal of Contaminant Hydrology, 154, 20-28
7.5	Hildebrandt A, Guillamón M, Lacorte S, Tauler R & Barceló D	2008	Impact of pesticides used in agriculture and vineyards to surface and groundwater quality (North Spain)	Water Research 42, 3315-3326
7.5	Silva E, Mendes MP, Ribeiro L & Cerejeira MJ	2012	Exposure assessment of pesticides in a shallow groundwater of the Tagus vulnerable zone (Portugal): a multivariate statistical approach (JCA)	Environ. Sci. Pollut. Res. 19: 2667-2680
7.5	Reemtsma T, Alder L & Banasiak U	2013	Emerging pesticide metabolites in groundwater and surface water as determined by the application of a multimethod for 150 pesticide metabolites	Water Research 47, 5535-5545

CA data point number	Author(s)	Year	Title	Source
7.5	Vryzas Z, Alexoudis C, Vassiliou G, Galanis K, Papadopoulou-Mourkidou E	2011	Determination and aquatic risk assessment of pesticide residues in riparian drainage canals in northeastern Greece	Ecotoxicology and Environmental Safety 74, 174-181
7.5	Antić N, Radišić M, Radović T, Vasiljević T, Grujić S, Petković A, Dimkić M, Laušević M	2014	Pesticide residues in the Danube river basin in Serbia – a survey during 2009-2011	Clean – Soil, Air, Water 00(0), 1-8
7.5	Boithias L, Sauvage S, Taghavi L, Merlina G, Probst J-L & Pérez LMS	2011	Occurrence of metolachlor and trifluralin losses in the Save river agricultural catchment during floods	Journal of Hazardous Materials 196, 210-219
7.5	Claver, A.; Ormad, P.; Rodriguez, L.; Ovelleiro, J.L	2006	Study of the presence of pesticides in surface waters in the Ebro river basin (Spain)	Chemosphere 8, 1437-1443
7.5	Hladik ML, Bouwer EJ & Roberts AL	2008	Neutral degradates of chloroacetamide herbicides: Occurrence in drinking water and removal during conventional water treatment	Water Research 42, 4905-4914
7.5	Schipper PNM, Vissers MJM & van der Linden AMA	2008	Pesticides in groundwater and drinking water wells: overview of the situation in the Netherlands	Water Science & Technology 57(8), 1277-1286
7.5	Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part II. Monitoring study in the south part of the basin.	Science of the Total Environment 321, 147-164
7.5	Freitas, L. G.; Singer, H.; Mueller, S. R.; Schwarzenbach, R. P.; Stamm, C.	2008	Source area effects on herbicide losses to surface waters - a case study in the Swiss Plateau.	Agriculture, Ecosystems & Environment (2008), Vol. 128, Number 3, pp. 177-184
7.5	Reemtsma T, Alder L & Banasiak U	2013	A multimethod for the determination of 150 pesticide metabolites in surface water and groundwater using direct injection liquid chromatography-mass spectrometry	Journal of Chromatography A 1271, 95-104
7.5	Silva E, Pereira AC, Estalagem SP, Moreira-Santos M, Ribeiro R & Cerejeira MJ	2012	Assessing the quality of freshwaters in a protected area within the Tagus river basin district (Central Portugal)	Journal of Environmental Quality 41, 1413-1426
7.5	Hildebrandt A, Lacorte S & Barceló D	2007	Assessment of priority pesticides, degradation products, and pesticide adjuvants in groundwater and top soils from agricultural areas of the Ebro river basin	Anal Bioanal Chem 387, 1459-1468
7.5	Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part I. Monitoring study in the north part of the basin.	Science of the Total Environment 321, 127-146
7.5	Köck-Schulmeyer M, Ginebreda A, Postigo C, Garrido T, Fraile J, López de Alda M & Barceló D	2014	Four-year advanced monitoring program of polar pesticides in groundwater of Catalonia (NE-Spain)	Science of the Total Environment 470-471, 1087-1098

CA data point number	Author(s)	Year	Title	Source
7.5	Loos R, Locoro G, Comero S, Contini S, Schwesig D, Werres F, Balsaa P, Gans O, Weiss S, Blaha L, Bolchi M, Gawlik B	2010	Pan-European survey on the occurrence of selected polar organic persistent pollutants in groundwater	Water Research 44, 4115-4126
7.5	Sagratini, G.; Ametisti, M.; Canella, M.; Cristalli, G.; Francoletti, E.; Giardina, D; Luminari, M. C; Paparelli, G; Pico, Y; Volpini, R; Vittori, S.	2007	Well water in central Italy: analysis of herbicide residues as potential pollutants of untreated crops.	Fresenius Environmental Bulletin (2007), Volume 16, Number 8, pp. 973-979
7.5	Rossi, C.; Menegus, L.; Mion, F.	2004	Pesticide products and their metabolism in water bodies and groundwater in Veneto.	Rapporti ISTISAN - Istituto Superiore di Sanita (2004), Number 04/35, pp. 121-130
7.5	Sanchez-Gonzalez, S; Pose-Juan, E; Herrero-Hernandez, E; Alvarez-Martin, A; Sanchez-Martin, MJ; Rodriguez-Cruz, S	2013	Pesticide residues in groundwaters and soils of agricultural areas in the Agueda River Basin from Spain and Portugal	International Journal of Environmental Analytical Chemistry (2013), 93 (15), 1585-1601.
7.5	Masia, Ana; Campo, Julian; Vazquez-Roig, Pablo; Blasco, Cristina; Pico, Yolanda	2012	Screening of currently used pesticides in water, sediments and biota of the Guadalquivir River Basin (Spain)	Journal of Hazardous Materials (2013), 263 (P1), 95-104
7.5	Herrero-Hernandez, Eliseo; Pose-Juan, Eva; Alvarez-Martin, Alba; Andrades, Maria Soledad; Rodriguez-Cruz, Maria Sonia; Sanchez-Martin, Maria J.	2012	Pesticides and degradation products in groundwaters from a vineyard region: Optimization of a multiresidue method based on SPE and GC-MS	Journal of Separation Science (2012), 35 (24), 3492-3500
7.5	Rocha, MJ; Ribeiro, MFT.; Cruzeiro, C; Figueiredo, F; Rocha, E	2012	Development and validation of a GC-MS method for determination of 39 common pesticides in estuarine water - targeting hazardous amounts in the Douro River estuary	International Journal of Environmental Analytical Chemistry (2012), 92 (14), 1587-1608
7.5	Rice, Clifford P.; Bialek-Kalinski, Krystyna; McCarty, Gregory W	2012	Chiral separation of metolachlor ethane sulfonic acid as a groundwater dating tool	SO Abstracts of Papers, 244th ACS National Meeting & Exposition, Philadelphia, PA, United States, August 19-23, 2012 (2012), AGRO-35
7.5	Koeck-Schulmeyer, M; Ginebreda, A; Gonzalez, S; Cortina, JL; de Alda, ML; Barcelo, D	2012	Analysis of the occurrence and risk assessment of polar pesticides in the Llobregat River Basin (NE Spain)	Chemosphere (2012), 86 (1), 8-16
7.5	Mansilha, C.; Melo, A.; Ferreira, I. M. P. L. V. O.; Pinho, O.; Domingues, V.; Pinho, C.; Gameiro, P.	2012	Groundwater from Infiltration Galleries Used for Small Public Water Supply Systems- Contamination with Pesticides and Endocrine Disruptors	Bulletin of Environmental Contamination and Toxicology (2011), 87 (3), 312-318
7.5	Finizio, Antonio; Azimonti, Giovanna; Villa, Sara	2011	Occurrence of pesticides in surface water bodies: A critical analysis of the Italian national pesticide survey programs	Journal of Environmental Monitoring (2011), 13 (1), 49-57

CA data point number	Author(s)	Year	Title	Source
7.5	Hamer, Kay; Freudenberger, Uta	2011	Plant protection legal irrelevant metabolites in groundwater	Wasser und Abfall (Wiesbaden, Germany) (2011), 13 (9), 42-45
7.5	Fava, L; Orru, MA; Scardala, S; Alonzo, E;Fardella, M; Strumia, C; Martinelli, A; Finocchiaro,S; Previtera, M; Franchi, A; Cala, P; Dovis,M; Bartoli, D; Sartori, G; Broglia, L; Funari, E	2010	Pesticides and their metabolites in selected Italian groundwater and surface water used for drinking	Annali dell'Istituto Superiore di Sanita (2010), 46 (3), 309-316
7.5	Vryzas, Z.; Vassiliou, G.; Alexoudis, C.; Papadopoulou-Mourkidou, E.	2009	Spatial and temporal distribution of pesticide residues in surface waters in northeastern Greece	Water Research (2009), 43 (1), 1-10.
7.5	Villaverde, J; Hildebrandt, A; Martinez, E; Lacorte, S;Morillo, E; Maqueda, C; Viana, P; Barcelo, D	2008	Priority pesticides and their degradation products in river sediments from Portugal	Science of the Total Environment (2008), 390 (2-3), 507-513
7.5	Wuelser, R	2005	Herbicide and pesticide studies in the Lange Erlen groundwater works	SO GWA (Zurich, Switzerland) (2005), 85 (1), 48-52
7.5	Kolpin, DW.; Schnoebelen, DJ.; Thurman, EM	2004	Degradates provide insight to spatial and temporal trends of herbicides in ground water	Ground Water (2004), 42 (4), 601-608
7.5	Karoly, G; Schremm, A; Boronkai, A	2004	Monitoring the pesticide contamination of the Lake Balaton and its inflows	Novenyvedelem (Budapest, Hungary) (2004), 40 (4), 185-192

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

Author(s)	Year	OECD data point number	Title	Source
Initial Search				
Aboul Eish, MYZ; Wells, MJM	2008	7.2.2	Monitoring stereoselective degradation of metolachlor in a constructed wetland: use of statistically valid enantiomeric and diastereomeric fractions as opposed to ratios.	Journal of chromatographic science, (2008 Mar) Vol. 46, No. 3, pp. 269-75.
Accinelli, C.; Dinelli, G.; Vicari, A.	2004	7.1.1.1	Metolachlor and linuron soil degradation after repeated applications under laboratory conditions.	Agrochimica (2004), Vol. 48, Number 3/4, pp. 132-140
Amalric L, Baran N, Coureau C, Maingot L, Buron F & Routier S	2013	7.5	Analytical developments for 47 pesticides: first identification of neutral chloroacetanilide derivatives in French groundwater	Inter. J. Environ. Anal. Chem. 93(15), 1660-1675
Antić N, Radišić M, Radović T, Vasiljević T, Grujić S, Petković A, Dimkić M, Laušević M	2014	7.5	Pesticide residues in the Danube river basin in Serbia – a survey during 2009-2011	Clean – Soil, Air, Water 00(0), 1-8

Author(s)	Year	OECD data point number	Title	Source
Baran N & Gourcy L	2013	7.5	Soprtion and mineralisation of S-metolachlor and its ionic metabolites in soils and vadose zone solids: Consequences on groundwater quality in an alluvial aquifer (Ain Plain, France)	Journal of Contaminant Hydrology, 154, 20-28
Barra CA; Giuliano G; Grenni P; Guzzella L; Pozzoni F; Bottoni P; Fava L; Crobe A; Orru M; Funari E	2005	7.1.4	Degradation and leaching of the herbicides metolachlor and diuron: a case study in an area of Northern Italy.	Environmental pollution (Barking, Essex : 1987), (2005 Apr) Vol. 134, No.3, pp. 525-34.
Boithias L, Sauvage S, Taghavi L, Merlina G, Probst J-L & Pérez LMS	2011	7.5	Occurrence of metolachlor and trifluralin losses in the Save river agricultural catchment during floods	Journal of Hazardous Materials 196, 210-219
Cao P, Wang X, Liu F, Zhao E & Han L	2008	7.1.1.1	Dissipation and Residue of S-Metolachlor in Maize and Soil	Bull Environ Contam Toxicol, Vol 80, pp. 391-394
Capel, Paul D.; Webb, Richard M. T.	2007	7.1.1.1	Multi-compartment analysis of the behavior and fate of metolachlor in the environment	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2007), 47(2), 593-595
Claver, A.; Ormad, P.; Rodriguez, L.; Ovelleiro, J.L	2006	7.5	Study of the presence of pesticides in surface waters in the Ebro river basin (Spain)	Chemosphere 8, 1437-1443
Coffinet, S.; Rifai, A.; Genty, C.; Souissi, Y.; Bourcier, S.; Sablier, M.; Bouchonnet, S.	2012	7.2.1.2	Characterization of the photodegradation products of metolachlor: structural elucidation, potential toxicity and persistence	Journal of Mass Spectrometry , Volume 47, Number 12, pp. 1582-1593
Doppler, T.; Camenzuli, L.; Hirzel, G.; Krauss, M.; Luck, A.; Stamm, C.	2012	7.1.4	Spatial variability of herbicide mobilization and transport at catchment scale: insights from a field experiment	Hydrology and Earth System Sciences (2012), 16 (7), 1947-1967
Fava, L; Orru, MA; Scardala, S; Alonzo, E;Fardella, M; Strumia, C; Martinelli, A; Finocchiaro,S; Previtera, M; Franchi, A; Cala, P; Dovis,M; Bartoli, D; Sartori, G; Broglia, L; Funari, E	2010	7.5	Pesticides and their metabolites in selected Italian groundwater and surface water used for drinking	Annali dell'Istituto Superiore di Sanita (2010), 46 (3), 309-316
Finizio, Antonio; Azimonti, Giovanna; Villa, Sara	2011	7.5	Occurrence of pesticides in surface water bodies: A critical analysis of the Italian national pesticide survey programs	Journal of Environmental Monitoring (2011), 13 (1), 49-57
Freitas, L. G.; Singer, H.; Mueller, S. R.; Schwarzenbach, R. P.; Stamm, C.	2008	7.5	Source area effects on herbicide losses to surface waters - a case study in the Swiss Plateau.	Agriculture, Ecosystems & Environment (2008), Vol. 128, Number 3, pp. 177-184
Gish, TJ; Prueger, JH; Daughtry, CST; Kustas, WP; McKee, LG; Russ, AL; Hatfield, JL	2011	7.3.2	Comparison of field-scale herbicide runoff and volatilization losses: an eight-year field investigation. Journal of environmental quality	Journal of environmental quality, Vol. 40, No. 5, pp.1432-42

Author(s)	Year	OECD data point number	Title	Source
Hamer, Kay; Freudenberger, Uta	2011	7.5	Plant protection legal irrelevant metabolites in groundwater	Wasser und Abfall (Wiesbaden, Germany) (2011), 13 (9), 42-45
Herrero-Hernandez, Eliseo; Pose-Juan, Eva; Alvarez-Martin, Alba; Andrades, Maria Soledad; Rodriguez-Cruz, Maria Sonia; Sanchez-Martin, Maria J.	2012	7.5	Pesticides and degradation products in groundwaters from a vineyard region: Optimization of a multiresidue method based on SPE and GC-MS	Journal of Separation Science (2012), 35 (24), 3492-3500
Hildebrandt A, Guillamón M, Lacorte S, Tauler R & Barceló D	2008	7.5	Impact of pesticides used in agriculture and vineyards to surface and groundwater quality (North Spain)	Water Research 42, 3315-3326
Hildebrandt A, Lacorte S & Barceló D	2007	7.5	Assessment of priority pesticides, degradation products, and pesticide adjuvants in groundwater and top soils from agricultural areas of the Ebro river basin	Anal Bioanal Chem 387, 1459-1468
Hladik ML, Bouwer EJ & Roberts AL	2008	7.5	Neutral degradates of chloroacetamide herbicides: Occurrence in drinking water and removal during conventional water treatment	Water Research 42, 4905-4914
Karoly, G; Schremm, A; Boronkai, A	2004	7.5	Monitoring the pesticide contamination of the Lake Balaton and its inflows	Novenyvedelem (Budapest, Hungary) (2004), 40 (4), 185-192
Klein, C, Schneider, RJ, Meter, MT & Aga, DS	2006	7.1.1.1	Enantiomeric separation of metolachlor and its metabolites using LC-MS and CZE	Chemosphere, 62, 1591-1599
Köck-Schulmeyer M, Ginebreda A, Postigo C, Garrido T, Fraile J, López de Alda M & Barceló D	2014	7.5	Four-year advanced monitoring program of polar pesticides in groundwater of Catalonia (NE-Spain)	Science of the Total Environment 470-471, 1087-1098
Koeck-Schulmeyer, M; Ginebreda, A; Gonzalez, S; Cortina, JL; de Alda, ML; Barcelo, D	2012	7.5	Analysis of the occurrence and risk assessment of polar pesticides in the Llobregat River Basin (NE Spain)	Chemosphere (2012), 86 (1), 8-16
Kolpin, DW.; Schnoebelen, DJ.; Thurman, EM	2004	7.5	Degradates provide insight to spatial and temporal trends of herbicides in ground water	Ground Water (2004), 42 (4), 601-608
Kurt-Karakus PH, Bidleman, TF, Muir, DCG, Struger J, Sverko E, Cagampan SJ, Small JM and Jantunen LM	2010	7.2.2	Comparison of concentrations and stereoisomer ratios of mecoprop, dichlorprop and metolachlor in Ontario streams, 2006-2007 vs. 2003-2004	Environmental Pollution, 158, 1842-1849
Loos R, Locoro G, Comero S, Contini S, Schwesig D, Werres F, Balsaa P, Gans O, Weiss S, Blaha L, Bolchi M, Gawlik B	2010	7.5	Pan-European survey on the occurrence of selected polar organic persistent pollutants in groundwater	Water Research 44, 4115-4126
Mansilha, C.; Melo, A.; Ferreira, I. M. P. L. V. O.; Pinho, O.; Domingues, V.; Pinho, C.; Gameiro, P.	2012	7.5	Groundwater from Infiltration Galleries Used for Small Public Water Supply Systems-Contamination with Pesticides and Endocrine Disruptors	Bulletin of Environmental Contamination and Toxicology (2011), 87 (3), 312-318
Masia, Ana; Campo, Julian; Vazquez-Roig, Pablo; Blasco, Cristina; Pico, Yolanda	2012	7.5	Screening of currently used pesticides in water, sediments and	Journal of Hazardous Materials (2013), 263 (P1), 95-104

Author(s)	Year	OECD data point number	Title	Source
			biota of the Guadalquivir River Basin (Spain)	
Mersie W, McNamee C, Seybold C & Tierney D	2004	7.2.2.	Degradation of metolachlor in bare and vegetated soils and in simulated water-sediment systems	Environ Toxicol Chem 23(11), 2627-2632
Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	7.5	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part II. Monitoring study in the south part of the basin.	Science of the Total Environment 321, 147-164
Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	7.5	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part I. Monitoring study in the north part of the basin.	Science of the Total Environment 321, 127-146
Polcaro CM, Berti A; Mannina, L; Marra C; Sinibaldi M; Viel S	2007	7.1.1.1	Chiral HPLC resolution of neutral pesticides	Journal of Liquid Chromatography & Related Technologies, 27:1,49-61
Reemtsma T, Alder L & Banasiak U	2013	7.5	Emerging pesticide metabolites in groundwater and surface water as determined by the application of a multimethod for 150 pesticide metabolites	Water Research 47, 5535-5545
Reemtsma T, Alder L & Banasiak U	2013	7.5	A multimethod for the determination of 150 pesticide metabolites in surface water and groundwater using direct injection liquid chromatography-mass spectrometry	Journal of Chromatography A 1271, 95-104
Rice, Clifford P.; Bialek-Kalinski, Krystyna; McCarty, Gregory W	2012	7.5	Chiral separation of metolachlor ethane sulfonic acid as a groundwater dating tool	SO Abstracts of Papers, 244th ACS National Meeting & Exposition, Philadelphia, PA, United States, August 19-23, 2012 (2012), AGRO-35
Rice PJ, Anderson TA & Coats JR	2004	7.2.2	Effect of sediment on the fate of metolachlor and atrazine in surface water	Environ. Toxicol. Chem 23(5); 1145-55
Rocha, MJ; Ribeiro, MFT.; Cruzeiro, C; Figueiredo, F; Rocha, E	2012	7.5	Development and validation of a GC-MS method for determination of 39 common pesticides in estuarine water - targeting hazardous amounts in the Douro River estuary	International Journal of Environmental Analytical Chemistry (2012), 92 (14), 1587-1608
Rossi, C.; Menegus, L.; Mion, F.	2004	7.5	Pesticide products and their metabolism in water bodies and groundwater in Veneto.	Rapporti ISTISAN - Istituto Superiore di Sanita (2004), Number 04/35, pp. 121-130
Sagratini, G.; Ametisti, M.; Canella, M.; Cristalli, G.; Francoletti, E.; Giardina, D; Luminari, M. C; Paparelli, G; Pico, Y; Volpini, R; Vittori, S.	2007	7.5	Well water in central Italy: analysis of herbicide residues as potential pollutants of untreated crops.	Fresenius Environmental Bulletin (2007), Volume 16, Number 8, pp. 973-979

Author(s)	Year	OECD data point number	Title	Source
Sanchez-Gonzalez, S; Pose-Juan, E; Herrero-Hernandez, E; Alvarez-Martin, A; Sanchez-Martin, MJ; Rodriguez-Cruz, S	2013	7.5	Pesticide residues in groundwaters and soils of agricultural areas in the Agueda River Basin from Spain and Portugal	International Journal of Environmental Analytical Chemistry (2013), 93 (15), 1585-1601.
Schipper PNM, Vissers MJM & van der Linden AMA	2008	7.5	Pesticides in groundwater and drinking water wells: overview of the situation in the Netherlands	Water Science & Technology 57(8), 1277-1286
Shaner, D L; Brunk, G; Belles, D; Westra, P; Nissen, S	2006	7.1.1.1	Soil dissipation and biological activity of metolachlor and S-metolachlor in five soils	Pest management science (2006), Volume 62, Number 7, pp. 617-623
Silva E, Mendes MP, Ribeiro L & Cerejeira MJ	2012	7.5	Exposure assessment of pesticides in a shallow groundwater of the Tagus vulnerable zone (Portugal): a multivariate statistical approach (JCA)	Environ. Sci. Pollut. Res. 19: 2667-2680
Silva E, Pereira AC, Estalagem SP, Moreira-Santos M, Ribeiro R & Cerejeira MJ	2012	7.5	Assessing the quality of freshwaters in a protected area within the Tagus river basin district (Central Portugal)	Journal of Environmental Quality 41, 1413-1426
Souissi Y, Bouchonnet S, Bourcier S, Kusk KO, Sbalier M & Andersen HR	2013	7.2.1.2	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water	Science of the Total Environment 458-460, 527-534
Villaverde, J; Hildebrandt, A; Martinez, E; Lacorte, S;Morillo, E; Maqueda, C; Viana, P; Barcelo, D	2008	7.5	Priority pesticides and their degradation products in river sediments from Portugal	Science of the Total Environment (2008), 390 (2-3), 507-513
Vryzas Z, Alexoudis C, Vassiliou G, Galanis K, Papadopoulou-Mourkidou E	2011	7.5	Determination and aquatic risk assessment of pesticide residues in riparian drainage canals in northeastern Greece	Ecotoxicology and Environmental Safety 74, 174-181
Vryzas Z; Papadakis EN; Papadopoulou-Mourkidou E	2012	7.1.4	Leaching of Br-, metolachlor, alachlor, atrazine, deethylatrazine and deisopropylatrazine in clayey vadoze zone: a field scale experiment in north-east Greece.	Water research, (2012 Apr 15) Vol. 46, No. 6, pp. 1979-89
Vryzas Zisis	2012	7.1.1.1	Biotransformation of atrazine and metolachlor within soil profile and changes in microbial communities.	Chemosphere, (2012 Nov) Vol. 89, No. 11, pp. 1330-8
Vryzas, Z.; Vassiliou, G.; Alexoudis, C.; Papadopoulou-Mourkidou, E.	2009	7.5	Spatial and temporal distribution of pesticide residues in surface waters in northeastern Greece	Water Research (2009), 43 (1), 1-10.
Wuelser, R	2005	7.5	Herbicide and pesticide studies in the Lange Erlen groundwater works	SO GWA (Zurich, Switzerland) (2005), 85 (1), 48-52

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

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

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.1.1.1	Accinelli, C.; Dinelli, G.; Vicari, A.	2004	Metolachlor and linuron soil degradation after repeated applications under laboratory conditions.	Agrochimica (2004), Vol. 48, Number 3/4, pp. 132-140	Does not meet relevance criteria – endpoint not relevant as soils exposed multiple times to test compounds (non-guideline compliant)
7.1.1.1	Capel, Paul D.; Webb, Richard M. T.	2007	Multi-compartment analysis of the behavior and fate of metolachlor in the environment	Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry (2007), 47(2), 593-595	Insufficient data to assess – abstract only
7.1.1.1	Polcaro CM, Berti A; Mannina, L; Marra C; Sinibaldi M; Viel S	2007	Chiral HPLC resolution of neutral pesticides	Journal of Liquid Chromatography & Related Technologies, 27:1,49-61	Does not meet relevance criteria: No details of the test material e.g. purity; No complete soil characterisation; No details on the biomass measurements or microbial activity; No verification of the exact amount applied and detected in soil; No details regarding the sample storage stability; No details on analytics: repeatability, linearity, accuracy and precision of the analytical method; No details of control samples.
7.1.1.1	Klein, C, Schneider, RJ, Meter, MT & Aga, DS	2006	Enantiomeric separation of metolachlor and its metabolites using LC-MS and CZE	Chemosphere, 62, 1591-1599	Does not meet relevance criteria – no information provided regarding sampling, storage or preparation of soil & sludge samples, no physicochemical characteristics of soil/sludge samples provided, no history of potential exposure of sludge/soil to metolachlor provided, insufficient samples for kinetics.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.1.1.1	Vryzas Zisis	2012	Biotransformation of atrazine and metolachlor within soil profile and changes in microbial communities.	Chemosphere, (2012 Nov) Vol. 89, No. 11, pp. 1330-8	Does not meet relevance criteria: soils analysed have a history of agrochemical application and are therefore non-guideline compliant. Further, no information is provided on the sampling, storage and reparation of soils for use in the experiment, and where subsoils are investigated, no discussion of preservation of anoxic/microaerophilic conditions is described despite this being clearly relevant for anaerobic microbes.
7.1.1.1	Cao P, Wang X, Liu F, Zhao E & Han L	2008	Dissipation and Residue of S-Metolachlor in Maize and Soil	Bull Environ Contam Toxicol, Vol 80, pp. 391-394	Does not meet relevance criteria – field sites have not been demonstrated to be geoclimitically relevant for EU
7.1.1.1	Shaner, D L; Brunk, G; Belles, D; Westra, P; Nissen, S	2006	Soil dissipation and biological activity of metolachlor and S-metolachlor in five soils	Pest management science (2006), Volume 62, Number 7, pp. 617-623	Does not meet relevance criteria – field sites have not been demonstrated to be geoclimitically relevant for EU, soil sampling, preparation and handling of soils is poorly described, field sites have likely received significant inputs of agrochemicals proceeding use in study and are thus non guideline compliant for rate evaluation.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.1.4	Vryzas Z; Papadakis EN; Papadopoulou-Mourkidou E	2012	Leaching of Br-, metolachlor, alachlor, atrazine, deethylatrazine and deisopropylatrazine in clayey vadoze zone: a field scale experiment in north-east Greece.	Water research, (2012 Apr 15) Vol. 46, No. 6, pp. 1979-89	Does not meet relevance criteria: no soil characterisation data provided for field sites, no historical product use history provided for sampling sites, no description of installation of suction lysimeters (in particular, no discussion of how this did not disrupt the soil profile and adversely impact the residue profile), no description of the groundwater monitoring well construction or installation….
7.1.4	Barra CA; Giuliano G; Grenni P; Guzzella L; Pozzoni F; Bottoni P; Fava L; Crobe A; Orru M; Funari E	2005	Degradation and leaching of the herbicides metolachlor and diuron: a case study in an area of Northern Italy.	Environmental pollution (Barking, Essex : 1987), (2005 Apr) Vol. 134, No.3, pp. 525-34.	Does not meet relevance criteria: No discussion of groundwater sample locations with specific absence of demonstrating that wells are not under point source influence (wells located on farmyards), no description of well construction or depths, no description of historical product use, no description of lysimeter installation protocols or depths.
7.1.4	Doppler, T.; Camenzuli, L.; Hirzel, G.; Krauss, M.; Luck, A.; Stamm, C.	2012	Spatial variability of herbicide mobilization and transport at catchment scale: insights from a field experiment	Hydrology and Earth System Sciences (2012), 16 (7), 1947-1967	Does not meet relevance criteria: LOQ not defined, no verification of spray application through spray card or other relevant device, soil extraction efficiency not reported; no details of soil analysis performance such as LOQ, repeatability or accuracy.
7.2.1.2	Coffinet, S.; Rifai, A.; Genty, C.; Souissi, Y.; Bourcier, S.; Sablier, M.; Bouchonnet, S.	2012	Characterization of the photodegradation products of metolachlor: structural elucidation, potential toxicity and persistence	Journal of Mass Spectrometry , Volume 47, Number 12, pp. 1582-1593	Does not meet relevance criteria: Not environmentally relevant as UV source is a mercury lamp emitting a spectrum irrelevant to sunlight (specifically wavelengths <290 nm)

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.2.1.2	Souissi Y, Bouchonnet S, Bourcier S, Kusk KO, Sbalier M & Andersen HR	2013	Identification and ecotoxicity of degradation products of chloroacetamide herbicides from UV-treatment of water	Science of the Total Environment 458-460, 527-534	Does not meet relevance criteria: Not environmentally relevant as UV source is a mercury lamp emitting a spectrum irrelevant to sunlight (specifically wavelengths <290 nm)
7.2.2	Aboul Eish, MYZ; Wells, MJM	2008	Monitoring stereoselective degradation of metolachlor in a constructed wetland: use of statistically valid enantiomeric and diastereomeric fractions as opposed to ratios.	Journal of chromatographic science, (2008 Mar) Vol. 46, No. 3, pp. 269-75.	Does not meet relevance criteria: No details on water characterisation No verification of the exact amount applied; No details of the recovery rate nor LOQ reported; No details on the sample storage stability; No details on analytics: repeatability, linearity, accuracy and precision of the analytical method; No replicates and control samples.
7.2.2	Kurt-Karakus PH, Bidleman, TF, Muir, DCG, Struger J, Sverko E, Cagampan SJ, Small JM and Jantunen LM	2010	Comparison of concentrations and stereoisomer ratios of mecoprop, dichlorprop and metolachlor in Ontario streams, 2006-2007 vs. 2003-2004	Environmental Pollution, 158, 1842-1849	Does not meet relevance criteria: Study conducted in Canada and as such not geoclimatically relevant for EU28, use rates historically higher than EU, no description of sampling points and catchment areas.
7.2.2	Rice PJ, Anderson TA & Coats JR	2004	Effect of sediment on the fate of metolachlor and atrazine in surface water	Environ. Toxicol. Chem 23(5); 1145-55	Does not meet relevance criteria: Only 3 sampling points and thus cannot be used to estimate DT50
7.2.2	Mersie W, McNamee C, Seybold C & Tierney D	2004	Degradation of metolachlor in bare and vegetated soils and in simulated water-sediment systems	Environ Toxicol Chem 23(11), 2627-2632	Does not meet relevance criteria: Study protocol differs radically from OECD308 study design.
7.5	Baran N & Gourcy L	2013	Soprtion and mineralisation of S-metolachlor and its ionic metabolites in soils and vadose zone solids: Consequences on groundwater quality in an alluvial aquifer (Ain Plain, France)	Journal of Contaminant Hydrology, 154, 20-28	Insufficient description of sampling location, catchments, hydrology, weather analysis or cropping. No details on analytics: repeatability, linearity, accuracy and precision of the analytical method

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Hildebrandt A, Guillamón M, Lacorte S, Tauler R & Barceló D	2008	Impact of pesticides used in agriculture and vineyards to surface and groundwater quality (North Spain)	Water Research 42, 3315-3326	Does not meet relevance criteria: Insufficient information provided regarding the construction, integrity and design of the groundwater sampling wells. Specifically, table 2 does not provide an indication of the screened interval. Further, description of groundwater sampling protocols is insufficient (potential contamination route). For surface water, no detailed description of sampling area and agrochemical use in the catchment area is provided, and no analysis of catchment hydrology and potential routes of transfer from fields to surface water.
7.5	Silva E, Mendes MP, Ribeiro L & Cerejeira MJ	2012	Exposure assessment of pesticides in a shallow groundwater of the Tagus vulnerable zone (Portugal): a multivariate statistical approach (JCA)	Environ. Sci. Pollut. Res. 19: 2667-2680	Does not meet relevance criteria: Insufficient description of the groundwater monitoring wells with regards to design, construction (in particular the integrity of the well and susceptibility to point source influences) and screen. Further, there is no interpretation of local groundwater flow direction nor an analysis of up-gradient agrochemical use (including potential point sources).
7.5	Reemtsma T, Alder L & Banasiak U	2013	Emerging pesticide metabolites in groundwater and surface water as determined by the application of a multimethod for 150 pesticide metabolites	Water Research 47, 5535-5545	Does not meet relevance criteria: The report describes a new multi-residue analytical method. No details are provided regarding the sampling points for either groundwater or surface water.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Vryzas Z, Alexoudis C, Vassiliou G, Galanis K, Papadopoulou-Mourkidou E	2011	Determination and aquatic risk assessment of pesticide residues in riparian drainage canals in northeastern Greece	Ecotoxicology and Environmental Safety 74, 174-181	Does not meet relevance criteria: No details of the recovery rate nor LOQ reported; No details on the sample storage stability; No details on analytics: repeatability, linearity, accuracy and precision of the analytical method; No replicates and control samples. Insufficient description of sampling location, catchments, hydrology, weather analysis or cropping.
7.5	Antić N, Radišić M, Radović T, Vasiljević T, Grujić S, Petković A, Dimkić M, Laušević M	2014	Pesticide residues in the Danube river basin in Serbia – a survey during 2009-2011	Clean – Soil, Air, Water 00(0), 1-8	Does not meet relevance criteria: Insufficient description of the sampling location and local hydrology of soils relevant to the local fields. No understanding of local cropping practices; no weather data supplied despite an indication that the monitored year was extremely unusual.
7.5	Boithias L, Sauvage S, Taghavi L, Merlina G, Probst J-L & Pérez LMS	2011	Occurrence of metolachlor and trifluralin losses in the Save river agricultural catchment during floods	Journal of Hazardous Materials 196, 210-219	Does not meet relevance criteria: No details of the recovery rate nor LOQ reported; No details on the sample storage stability; No details on analytics: repeatability, linearity, accuracy and precision of the analytical method; No replicates and control samples.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Claver, A.; Ormad, P.; Rodriguez, L.; Ovelleiro, J.L	2006	Study of the presence of pesticides in surface waters in the Ebro river basin (Spain)	Chemosphere 8, 1437-1443	Does not meet relevance criteria: Insufficient description of the sampling location and local hydrology of soils relevant to the local fields. No understanding of local cropping practices; no weather data supplied; analytical methodology is not described, no LOD/LOQ, no evidence of control blanks, method performance questionable (recovery 65-135% is not compliant with method validation requirements) NB – metolachlor is not registered for use on wheat.
7.5	Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part II. Monitoring study in the south part of the basin.	Science of the Total Environment 321, 147-164	Does not meet relevance criteria: no description of the appropriate installation of lysimeter or groundwater monitoring equipment in the test fields, no documentation of product use in the vicinity of the test fields, no information provided on geology or hydrogeology of the test sites, no information provided about the estuarine sampling location and consideration of their catchment and product use therein.
7.5	Freitas, L. G.; Singer, H.; Mueller, S. R.; Schwarzenbach, R. P.; Stamm, C.	2008	Source area effects on herbicide losses to surface waters - a case study in the Swiss Plateau.	Agriculture, Ecosystems & Environment (2008), Vol. 128, Number 3, pp. 177-184	Metolachlor was not the main targets of the monitoring, just used as a tracer.
7.5	Reemtsma T, Alder L & Banasiak U	2013	A multimethod for the determination of 150 pesticide metabolites in surface water and groundwater using direct injection liquid chromatography-mass spectrometry	Journal of Chromatography A 1271, 95-104	Does not meet relevance criteria; Predominantly a method development paper.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Hladik ML, Bouwer EJ & Roberts AL	2008	Neutral degradates of chloroacetamide herbicides: Occurrence in drinking water and removal during conventional water treatment	Water Research 42, 4905-4914	Does not meet relevance criteria: insufficient description of groundwater sample points and their relevant construction features and proximity to agronomic regions. No description of potential recharge zones for monitored areas and use of key herbicides in said recharge areas. No evidence that regions are geoclimitically relevant to EU28. No description of surface water bodies and potential influences on quality of surface water.
7.5	Silva E, Pereira AC, Estalagem SP, Moreira-Santos M, Ribeiro R & Cerejeira MJ	2012	Assessing the quality of freshwaters in a protected area within the Tagus river basin district (Central Portugal)	Journal of Environmental Quality 41, 1413-1426	Does not meet relevance criteria: Insufficient (no) description of groundwater sampling well construction, design and intake, specifically integrity of well and protection from point sources. Further, the location of the monitoring well considering regional groundwater flow and upstream cropping is not reported. With RE: Surface water, there is no description of sampling points, catchments, hydrology, weather analysis or cropping.
7.5	Hildebrandt A, Lacorte S & Barceló D	2007	Assessment of priority pesticides, degradation products, and pesticide adjuvants in groundwater and top soils from agricultural areas of the Ebro river basin	Anal Bioanal Chem 387, 1459-1468	Does not meet relevance criteria: Insufficient description of groundwater sampling well construction, design and intake, specifically integrity of well and protection from point sources. Further, the location of the monitoring well considering regional groundwater flow and upstream cropping is not reported.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Papadopoulou-Mourkidou E, Karpouzas DG, Patsias J, Kotopoulou A, Milothridou A, Kintzikoglou K & Vlachou P	2004	The potential of pesticides to contaminate the groundwater resources of the Axios river basin in Macedonia, Northern Greece. Part I. Monitoring study in the north part of the basin.	Science of the Total Environment 321, 127-146	Does not meet relevance criteria: no description of the appropriate installation of lysimeter or groundwater monitoring equipment in the test fields (in particular how potential preferential flow pathways were avoided), no documentation of product use in the vicinity of the test fields, no information provided on geology or hydrogeology of the test sites,
7.5	Köck-Schulmeyer M, Ginebreda A, Postigo C, Garrido T, Fraile J, López de Alda M & Barceló D	2014	Four-year advanced monitoring program of polar pesticides in groundwater of Catalonia (NE-Spain)	Science of the Total Environment 470-471, 1087-1098	Does not meet relevance criteria: Insufficient description of groundwater sampling wells and sampling methodology. A number of the wells appear to be constructed with very long screens in deep groundwater bodies. Unknown impact of point source on well integrity.
7.5	Loos R, Locoro G, Comero S, Contini S, Schwesig D, Werres F, Balsaa P, Gans O, Weiss S, Blaha L, Bolchi M, Gawlik B	2010	Pan-European survey on the occurrence of selected polar organic persistent pollutants in groundwater	Water Research 44, 4115-4126	Does not meet relevance criteria: insufficient description of groundwater sample points and their relevant construction features and proximity to agronomic regions. No description of potential recharge zones for monitored areas and use of key herbicides in said recharge areas.
7.5	Sagratini, G.; Ametisti, M.; Canella, M.; Cristalli, G.; Francoletti, E.; Giardina, D; Luminari, M. C; Paparelli, G; Pico, Y; Volpini, R; Vittori, S.	2007	Well water in central Italy: analysis of herbicide residues as potential pollutants of untreated crops.	Fresenius Environmental Bulletin (2007), Volume 16, Number 8, pp. 973-979	Does not meet relevance criteria: Irrigation wells are subject to contamination and as such are not appropriate for use to derive groundwater quality. No description of well construction or design, no description of sampling protocol.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Rossi, C.; Menegus, L.; Mion, F.	2004	Pesticide products and their metabolism in water bodies and groundwater in Veneto.	Rapporti ISTISAN - Istituto Superiore di Sanita (2004), Number 04/35, pp. 121-130	Does not meet relevance criteria: No description of sampling locations with respect to potential point source (location on farmyards?) or agronomic applications, no description of well construction or design, no description of sampling protocol.
7.5	Sanchez-Gonzalez, S; Pose-Juan, E; Herrero-Hernandez, E; Alvarez-Martin, A; Sanchez-Martin, MJ; Rodriguez-Cruz, S	2013	Pesticide residues in groundwaters and soils of agricultural areas in the Agueda River Basin from Spain and Portugal	International Journal of Environmental Analytical Chemistry (2013), 93 (15), 1585-1601.	Does not meet relevance criteria: No description of sampling locations with respect to potential point source (location on farmyards?) or agronomic applications, no description of well construction or design, no description of sampling protocol.
7.5	Masia, Ana; Campo, Julian; Vazquez-Roig, Pablo; Blasco, Cristina; Pico, Yolanda	2012	Screening of currently used pesticides in water, sediments and biota of the Guadalquivir River Basin (Spain)	Journal of Hazardous Materials (2013), 263 (P1), 95-104	Does not meet relevance criteria: no description of the sampling points with relation to catchment area and potential agronomic uses in said catchments, no information on hydrology, no assessment of potential point source contamination.
7.5	Herrero-Hernandez, Eliseo; Pose-Juan, Eva; Alvarez-Martin, Alba; Andrades, Maria Soledad; Rodriguez-Cruz, Maria Sonia; Sanchez-Martin, Maria J.	2012	Pesticides and degradation products in groundwaters from a vineyard region: Optimization of a multiresidue method based on SPE and GC-MS	Journal of Separation Science (2012), 35 (24), 3492-3500	Does not meet relevance criteria: a method validation report mostly, no details provided with regards to the nature or construction of the groundwater sampling wells and potential agrochemical use in the recharge zone.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Rocha, MJ; Ribeiro, MFT.; Cruzeiro, C; Figueiredo, F; Rocha, E	2012	Development and validation of a GC-MS method for determination of 39 common pesticides in estuarine water - targeting hazardous amounts in the Douro River estuary	International Journal of Environmental Analytical Chemistry (2012), 92 (14), 1587-1608	Does not meet relevance criteria: no description of the sampling points with relation to catchment area and potential agronomic uses in said catchments, no information on hydrology, no assessment of potential point source contamination.
7.5	Rice, Clifford P.; Bialek-Kalinski, Krystyna; McCarty, Gregory W	2012	Chiral separation of metolachlor ethane sulfonic acid as a groundwater dating tool	SO Abstracts of Papers, 244th ACS National Meeting & Exposition, Philadelphia, PA, United States, August 19-23, 2012 (2012), AGRO-35	Abstract – insufficient data to assess
7.5	Koeck-Schulmeyer, M; Ginebreda, A; Gonzalez, S; Cortina, JL; de Alda, ML; Barcelo, D	2012	Analysis of the occurrence and risk assessment of polar pesticides in the Llobregat River Basin (NE Spain)	Chemosphere (2012), 86 (1), 8-16	Does not meet relevance criteria: No site characterisation data, no catchment data provided, no correlation with rainfall events, no product use survey in proximity of sampling locations to demonstrate potential pathways, no surface water flow rates or discharge volumes…
7.5	Mansilha, C.; Melo, A.; Ferreira, I. M. P. L. V. O.; Pinho, O.; Domingues, V.; Pinho, C.; Gameiro, P.	2012	Groundwater from Infiltration Galleries Used for Small Public Water Supply Systems-Contamination with Pesticides and Endocrine Disruptors	Bulletin of Environmental Contamination and Toxicology (2011), 87 (3), 312-318	Does not meet relevance criteria: Study describes groundwater collected in infiltration galleries which are a unique and irregular GW collection structure. Such data cannot be interpreted to provide an indication of potential leaching and overall groundwater health.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Finizio, Antonio; Azimonti, Giovanna; Villa, Sara	2011	Occurrence of pesticides in surface water bodies: A critical analysis of the Italian national pesticide survey programs	Journal of Environmental Monitoring (2011), 13 (1), 49-57	Does not meet relevance criteria: No site characterisation data, no catchment data provided, no correlation with rainfall events, no product use survey in proximity of sampling locations to demonstrate potential pathways, no surface water flow rates or discharge volumes, no description of groundwater sampling well locations, groundwater well construction or the potential for point source exposure in SW and GW samples. Further, the authors also questions the principles and approaches of the monitoring campaign.
7.5	Hamer, Kay; Freudenberger, Uta	2011	Plant protection legal irrelevant metabolites in groundwater	Wasser und Abfall (Wiesbaden, Germany) (2011), 13 (9), 42-45	Does not meet relevance criteria: no description of well design and construction, no details of pesticide use history in the recharge zone of the monitoring well, no discussion of well
7.5	Fava, L; Orru, MA; Scardala, S; Alonzo, E;Fardella, M; Strumia, C; Martinelli, A; Finocchiaro,S; Previtera, M; Franchi, A; Cala, P; Dovis,M; Bartoli, D; Sartori, G; Broglia, L; Funari, E	2010	Pesticides and their metabolites in selected Italian groundwater and surface water used for drinking	Annali dell'Istituto Superiore di Sanita (2010), 46 (3), 309-316	Does not meet relevance criteria: No description of sampling locations with respect to potential point source (location on farmyards?) or agronomic applications, no description of well construction or design, no description of sampling protocol.

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Vryzas, Z.; Vassiliou, G.; Alexoudis, C.; Papadopoulou-Mourkidou, E.	2009	Spatial and temporal distribution of pesticide residues in surface waters in northeastern Greece	Water Research (2009), 43 (1), 1-10.	Does not meet relevance criteria: No site characterisation data, no catchment data provided, no correlation with rainfall events, no product use survey in proximity of sampling locations to demonstrate potential pathways, no surface water flow rates or discharge volumes…
7.5	Villaverde, J; Hildebrandt, A; Martinez, E; Lacorte, S;Morillo, E; Maqueda, C; Viana, P; Barcelo, D	2008	Priority pesticides and their degradation products in river sediments from Portugal	Science of the Total Environment (2008), 390 (2-3), 507-513	Does not meet relevance criteria: no information provided about the sampling locations for the sediment samples, no attempt to relate site location to relevant agronomic practices in the region.
7.5	Wuelser, R	2005	Herbicide and pesticide studies in the Lange Erlen groundwater works	GWA (Zurich, Switzerland) (2005), 85 (1), 48-52	Does not meet relevance criteria; Insufficient information provided on sampling wells (construction, depths, screened intervals), no review of local cropping, analytical method poorly described
7.5	Kolpin, DW.; Schnoebelen, DJ.; Thurman, EM	2004	Degradates provide insight to spatial and temporal trends of herbicides in ground water	Ground Water (2004), 42 (4), 601-608	Does not meet relevance criteria: no description of well design and construction, no details of pesticide use history in the recharge zone of the monitoring well, no discussion of well screened interval, regions not necessarily geoclimatically relevant, use rates in USA much higher than EU28.
7.5	Karoly, G; Schremm, A; Boronkai, A	2004	Monitoring the pesticide contamination of the Lake Balaton and its inflows	Novenyvedelem (Budapest, Hungary) (2004), 40 (4), 185-192	Does not meet relevance criteria: not available to review

CA data point number	Author(s)	Year	Title	Source	Reason for exclusion
7.5	Schipper, PNM.; Vissers, MJM.; van der Linden, AMA.	2008	Pesticides in groundwater and drinking water wells; overview of the situation in the Netherlands	Water Science and Technology (2008), Volume 57, Number 8, pp. 1277-1286	Does not meet relevance criteria: Insufficient information provided on sampling wells (construction, depths, screened intervals), no review of local cropping, analytical method poorly described. Document is a simplistic overview of monitoring in Netherlands and Is not suitable for assessing leaching processes.
7.5	Amalric L, Baran N, Coureau C, Maingot L, Buron F & Routier S	2013	Analytical developments for 47 pesticides: first identification of neutral chloroacetanilide derivatives in French groundwater	Inter. J. Environ. Anal. Chem. 93(15), 1660-1675	Does not meet relevance criteria: Insufficient data has been provided on the groundwater sampling locations including the structure and design of the monitoring equipment. In particular, no data is provided regarding linking monitoring location to applications of agrochemicals in the recharge areas. Further, the report appears to be punctuated by errors (see Figure 1 where structures XI and XV are the same).

All documents listed in Table 9.6-2 and not excluded (i.e. not listed in Table 9.6-4) are given below.

Table 9.6-5: List of references which are discussed further

CA data point/ reference number	Authors	Year	Title	Source	Ref. ID
7.3.2	Gish, TJ; Prueger, JH; Daughtry, CST; Kustas, WP; McKee, LG; Russ, AL; Hatfield, JL.	2011	Comparison of Field-scale Herbicide Runoff and Volatilization Losses: An Eight-Year Field Investigation	Journal of Environmental Quality, (2011) 40, pp.1432-42	EU034