

**APPENDIX A**

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**Summary of Available and Relevant Toxicity Data  
from Ecological Risk Assessment Literature  
Review for Diuron**



# Appendix A

## Summary of Available and Relevant Toxicity Data from Ecological Risk Assessment Literature Review for Diuron

### Introduction

A literature review and ecological data evaluation was conducted on nine herbicides that are currently being used or are proposed for use by the Bureau of Land Management (BLM) for vegetation management on 261 million acres of public lands in the Western U.S., including Alaska. The information gathered from this evaluation will be included along with other collected data to derive toxicity reference values for use in the ecological risk assessment (ERA; ENSR 2005). The ERA was conducted in conjunction with the Vegetation Treatments Programmatic Ecological Impact Statement (PEIS) for the BLM. Scientific papers were gathered during this process to provide data on acute and chronic toxicity of selected herbicides to the non-target species. The review process included consideration of U.S. Fish and Wildlife Service (USFWS) draft literature search guidance. The nine herbicides that were investigated during this evaluation were as follows:

- Diflufenzopyr
- Diquat
- Fluridone
- Imazapic
- Sulfometuron-methyl
- Bromacil
- Chlorsulfuron
- Diuron
- Tebuthiuron

This review process was carried out in three tiers: Tier I – Literature search and preliminary review to select individual manuscripts; Tier II – Screening to determine whether the manuscript is acceptable; and Tier III – Thorough review to obtain data for possible toxicity reference value (TRV) use. This report provides information for diuron; the other chemicals are discussed in separate reports.

### Literature Search Methodology

The literature review process was initiated by conducting a keyword search pertaining to each of the nine chemicals in selected databases. The keyword search for all databases, except for one (Chemical Abstracts/Scifinder Scholar), included the herbicide name but not the commercial name (i.e., some commercial names are common words). The search parameters for Chemical Abstracts consisted of the herbicide name and chemical abstracts service (CAS) registry number. The open literature search was conducted at Colorado State University, Fort Collins, CO. The search period for diuron was from 1970 (the start of the database) to 2003. The following 12 databases were searched:

- AGRICOLA
- ASFA (Aquatic Sciences and Fisheries Abstracts)
- Biological Sciences
- BIOSIS / Biological Abstracts
- Chemical Abstracts / Scifinder Scholar
- Environmental Science and Pollution Management
- MedLine
- Safety Science and Risk

- Toxline
- Water Resources Abstracts
- Web of Science / Science Citation Index
- Zoological Records

All of the documents obtained in the open literature searches were then evaluated by a Senior Toxicologist to select manuscripts pertaining to the specific objectives of this project (Tier I). Relevant studies were those that were judged, to the extent possible while searching literature databases (i.e., relying on title and abstract, when available), to provide useful data for conducting the ERA. Relevant studies contained the following information at a minimum:

- Acute (mortality vs. survival) or chronic (largely growth or reproduction, although other sublethal data—if available—were also considered potentially relevant) toxicity data for the active ingredient.
- Verifiable numeric endpoint values (e.g., LC<sub>50</sub>, NOEC) that could be used in the risk characterization process.
- Toxicity data for clinical test species (e.g., mice, rats) and species used for screening non-human impacts (all other mammals, birds, invertebrates, algae, plants).
- Field or mesocosm studies were also included, but only if effects from exposure to the single herbicide in question could be identified and separated from other stressors.

Literature that was excluded as part of this initial literature gathering process included:

- analytical chemistry studies;
- methods papers without specific toxicity data;
- modeling studies that contained no empirically-derived data; and
- reviews or reports that were not primary toxicity data sources (except as a source for obtaining primary literature).

These search criteria enhanced the ability to screen scientific papers for the type of toxicity information needed in the ERA. Hard copies of all manuscripts that met these criteria were then obtained for further evaluation. Once articles were obtained, they were incorporated into a comprehensive management database (EndNote®). There were 243 documents identified from this process and obtained for further consideration. The bibliography list of articles obtained for diuron is included in this report (Appendix A.1).

### **Literature Review Methodology**

A cursory review (Tier II) was performed on each manuscript after a hard copy was obtained. Exclusion and inclusion criteria to determine acceptability for further review were developed prior to the process in conjunction with the BLM. Manuscripts were excluded that dealt only with the following subjects:

- Human health effects
- Effects on microorganisms: (e.g., fungi, bacteria)
- Genotoxic effects (mutagenic, carcinogenic)
- Bioassays on cells of a whole organism (e.g., rat hepatocytes, rat liver S9)
- Effects on target plants (efficacy testing)
- Non-toxic effects (e.g., fate, transport, leaching, analytical methods)
- Mixtures including herbicides other than the nine being reviewed

In addition, manuscripts that solely included data on marine receptors were originally excluded; however, these data were later included because marine ecosystems could be adjacent to application areas on BLM lands.

Inclusion criteria and rating (on a scale of 1 [weak] to 5 [strong]) of issues that were to be emphasized (requiring a subsequent review step) were as follows:

1. Effects on nontarget receptors related to ERA protocol
2. Chronic, sub-lethal, or reproductive effects that may have adverse effects on populations
3. Effects from inerts, degradates, and metabolites
4. Studies with mixtures that include diuron and any of the 8 other herbicides (i.e., not containing other herbicides)
5. Indirect effects to food supply or cover

Additional criteria that were used in reviewing papers (reviewers answered ‘Yes’ or ‘No’) are listed below:

- Were the corroborating studies described in sufficient detail (i.e., weight of evidence)?
- Did the study have a proper exposure dose, mechanism, and duration?
- Did the test include proper sample size, statistical analysis, and especially statistical endpoints (e.g., NOAEL, EC<sub>50</sub>) or dose response curves?
- Were proper controls used and were they acceptable?
- Were the data published in a peer-reviewed journal?

Each of the 243 identified papers was scored on the selection criteria listed above, including documentation of the number of test organisms, statistical analysis, proper use, and performance of controls, and the study was classified as either “adequate” or “not adequate”.

In Tier III, papers that were found to be acceptable for use were evaluated more thoroughly based on criteria developed with the BLM, and the following information is included as a second review form page for each manuscript (Appendix A.2):

- Author(s).
- Date of publication.
- Title of publication.
- Name of publication.
- Herbicide(s) used in the study.
- Receptor category: 20 g mammal, honey bee, 70 kg herbivore, small bird, large bird, non-target plants (monocot and dicot), warmwater fish, coldwater fish, aquatic invertebrate, aquatic plant, aquatic macrophyte). The specific life history stage was also recorded when available.
- Exposure conditions specifying the formulation, concentration, or amount of active ingredient and medium.
- Effect: Acute or sublethal effect end points of product formulations and breakdown products, and/or their component chemicals, such as: larval and embryonic developmental effects, endocrine disruption, reproductive impairment, changes in behavioral traits such as predator avoidance, feeding/appetite, lethargy or excitement, homing ability, swimming speed, or attraction to or repulsion from the chemicals.
- Toxicity endpoints (e.g., NOAEL, EC<sub>50</sub>, LC<sub>50</sub>, or dose response curve).
- Degradates, inerts, if available.
- Ecological conditions of study (e.g., mesocosm, static/flow-through, water quality parameters).
- Comments (e.g., mixture effects: additive, synergistic, or antagonistic effect end points of multiple products, other observations).

The Tier II and III reviews for diuron were conducted by only one senior toxicologist (this is consistent with the scope of work outlined for the review process). In some cases, a second (or third) review of data adequacy took

place when a separate senior toxicologist compiled the Tier III reviews and entered the pertinent information into a master spreadsheet documenting review findings for possible use in TRV derivation. The documents used in this TRV derivation are designated in **bold** in the bibliography (Appendix A.1), and the derivation of TRVs from all available sources is reported in the ERA (ENSR 2005).

## Results

There were 61 papers discovered in the open review of the literature for diuron, and of these, 32 were reviewed as part of the Tier III process. Data from 29 manuscripts were incorporated into the spreadsheet for TRV derivation for diuron (Table 1; Appendix A.3).

**TABLE 1**  
**Summary of the Results of the Open Literature Review for Diuron**

Total number of papers obtained for diuron	61
Total number of papers accepted for Tier II review	32
Total number of papers used in TRV derivation	29

The data collected during this review resulted in toxicity information for aquatic invertebrates (cladocerans, spider mites, amphipods, midges, oligochaetes, polychaetes, snails), terrestrial invertebrates (earthworms, ladybugs), diatoms, algae (several species), fish (fathead minnow, catfish, bluegill, goldfish, carp), aquatic macrophytes (seagrass, duckweed), sea urchin, amphibians (frogs), birds (ducks, pheasants, quails), and small mammals (rats). There were multiple studies for some species. Data were available on the chronic toxicity of diuron to several species including fathead minnow (Call et al. 1987), diatom (Hentschel and Jumars 1994), marine periphyton (Molander et al. 1992), frog (Schuytema and Nebeker 1998), and rat (Khera et al. 1979). Two studies were found that examined the toxic effects of degradation products of diuron (Tixier et al. 2001; Fernandez-Alba et al. 2002). There were no studies that examined the toxicity of mixtures of diuron with any of the other eight herbicides evaluated. Several studies examined the indirect effects of diuron on food supply via changes in algal density (e.g., Ma et al. 2001; Ma 2002; Fernandez-Alba et al. 2002; Ma et al. 2002), diatom abundance (Hentschel and Jumars 1994) duckweed growth (Teisseire et al. 1999), and aquatic macrophyte biomass (Macinnis-Ng and Ralph 2003).

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**APPENDIX A.1**  
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**APPENDIX A.2**

**TIER II AND III LITERATURE REVIEW FORMS**

Reviewer/Date:	RJW 10/16/03
Title of Paper/Report:	Hepato-toxic effect of diuron in albino rats
Author(s)	Agrawal + Kumar
Journal/Year/Vol:Pages	Indian J Exp Biol 1999 / 37: 503-504

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	yes (tumor initiation promoting eff)
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	NO
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	yes
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	very briefly
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	NO
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	?

Should evaluation of this paper continue in Task 2? **NO**

Additional comments regarding acceptance/rejection:

- does compare liver wt w/ control (NS @ 250mg/kg)

- very little detail

Reviewer/Date:	RZN
Title of Paper/Report:	Effect of diuron on germ cells of mice
Author(s)	Agrawal & Mehrotra
Journal/Year/Vol:Pages	Indian J. of Exp. Biol.

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO
Effects to microorganisms	NO
Genotoxic effects (mutagenic, carcinogenic)	Yes
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	NO
Effects to target plants (efficacy testing)	NO
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	NO
Mixtures including non-BLM herbicides	NO
Marine receptors	NO

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	mutagenic test - excluded

Reviewer/Date:	PN 10/7/03
Title of Paper/Report:	Diuron
Author(s)	Anonymous
Journal/Year/Vol:Pages	Dangerous Properties of industrial materials report Sept/02 1984 p49-55

Task 1: Application of Selection Criteria

A. Indicate if the paper meets these exclusion criteria

Issue (deals only with)	Indicate Yes or No
Human health effects	NO
Effects to microorganisms	No
Genotoxic effects (mutagenic, carcinogenic)	Yes
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	No
Effects to target plants (efficacy testing)	No
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	NO
Mixtures including non-BLM herbicides	No
Marine receptors	Yes

B. Issues to be emphasized

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1 summary
Chronic effects (e.g., reproductive) that may affect populations	NA
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	NA

C. Other Criteria

Issue	Indicate Yes or No
Are corroborating studies described?	NO
Was the test of proper exposure dose, mechanism, & duration?	NA
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	NA
Were proper controls used and was control performance acceptable?	NA
Are the data presented in a peer-reviewed journal?	No

Should evaluation of this paper continue in Task 2? **NO**

Additional comments regarding acceptance/rejection:

summary of info on diuron  
unable to validate refs  
p50 table of fw tox  
p51 table of sw & animal tox

Reviewer/Date:	RJN 10/7/03
Title of Paper/Report:	Bromacil and Diuron herbicides: toxicity, uptake, and elimination in freshwater fish
Author(s)	Call et al
Journal/Year/Vol:Pages	Arch Environ Contam Toxicol 1987 16: 607-613

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	3
Chronic effects (e.g., reproductive) that may affect populations	4
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	Med-high ranking

**Task 2: Data Evaluation**

Reviewer/Date:	PLSN 10/1/03
Partial Title of Paper/Report:	Bromacil and diuron herbicides...

Herbicides tested:	bromacil diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	fathead minnow		
Life Stage:	30 d old eggs, fry, juvenile fish		
Duration:	168h / 64 d		

Exposure Conditions	
Formulation:	B: tech. grade 75% D: " " 98.6%
Concentration/amount of active ingredient:	B: D:
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	B: 0.1, 1.9, 4.4, 12, 29 mg/L D: 0.2, 6, 14.5, 33.4, 78.0 mg/L } 60 d study
Test System (e.g., flow-thru, mesocosm, etc.):	flow-through 0.5L every 8-11 min

Test System Monitoring			
Dissolved Oxygen:	> 88.6%	Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:	7.4 ± 0.1	Ammonia:	
Other (hard):	47.4 ± 2.8 mg/L	Other (acidity):	2.2 ± 0.6
Other (alk):	43.0 ± 2.3	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	96h 168h	192h	29.0	> 29 mg/L survival bromacil	
Growth	B 182	167 mg/L	-	1 mg/L bromacil wet wt c 60 d	
Reproduction	D 14.2	-	27 mg/L		
Embryo/Larval Develop.			23.4	78 mg/L diuron survival	

Degradates/Inerts:	
Additional Comments and Observations:	- BCFs = < 3.2 (bromacil) & 2.0 (diuron) - elimination of both in rainbow trout - measured cones reported

Reviewer/Date:	RSN 10/7/03
Title of Paper/Report:	Toxicity of Fluometuron and diuron on the intermediate snail host ( <i>Lymnaea</i> spp.) of <i>Fasciola hepatica</i>
Author(s)	Christian and Tate
Journal/Year/Vol:Pages	Ball Environ Contam Toxicol 1982 :628-631 28(353)

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	Yes
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	↓
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	NA acute effects
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection: low ranking	

**Task 2: Data Evaluation**

Reviewer/Date:	RBN 10/7/03
Partial Title of Paper/Report:	

Herbicides tested:	<del>Fluometuron</del> Diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	Lymnaea snail
Test Species:	Lymnaea spp.		
Life Stage:	N.P.		
Duration:	96h		

Exposure Conditions	
Formulation:	N.P.
Concentration/amount of active ingredient:	N.P.
Medium (water, food, soil, etc.):	Water
Test Concentrations (if appropriate):	0-100 mg/L
Test System (e.g., flow-thru, mesocosm, etc.):	Static!

Test System Monitoring	
Dissolved Oxygen:	N.P.
Temperature:	↓
pH:	
Other ( )::	
Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	15.3 mg/L				
Growth	34.7 ↓				
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<p>- stats used</p> <p>- no report of analytical, likely nominal concs</p> <p>- also have 24, 48 &amp; 72 h data</p> <p>- not a very detailed report</p>

Reviewer/Date:	LRN 10/7/03
Title of Paper/Report:	Effects of pesticides on embryonic development of clams and oysters and on survival and growth of the larvae
Author(s)	Davis & Hidu
Journal/Year/Vol:Pages	Fishery Bull 1969 67:303-404

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ Yes
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	not evaluated ↓ yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	yes NO
Additional comments regarding acceptance/rejection: Duron marine study	

Reviewer/Date:	RSN 10/7/03
Title of Paper/Report:	Application of whole effluent toxicity test procedures to ambient water quality assessment
Author(s)	de Vlaming et al
Journal/Year/Vol:Pages	Environ Toxicol Chem 2000 19:42-62

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NA ↓ ↓ ↓ ↓ ↓ ↓ ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓ ↓ ↓ ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	YES
Was the test of proper exposure dose, mechanism, & duration?	YES
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	↓ ↓ ↓
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection: duration evaluation of field collected waters + identifying sources of toxicity	

Reviewer/Date:	R3N 10/7/03
Title of Paper/Report:	Evaluation of the effects of diuron and its derivatives on Lemna gibba using a fluorescence toxicity index
Author(s)	Dewez et al
Journal/Year/Vol:Pages	Environ Toxicol 2002 17:493-501

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	NA
Inerts, degradates, metabolite effects	4
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	Not evaluated
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	↓
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection: endpt uses fluorescence - not related to effect on biomass and production, etc	



Reviewer/Date:	RSN 10/8/05
Title of Paper/Report:	Toxicity evaluation of single and mixed antifouling biocides measured with acute
Author(s)	Fernández-Alba, Hernando, Piedra, Christi
Journal/Year/Vol:Pages	Amb. Chim Acta 2002 456:303-312

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals <u>only</u> with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	algae
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	No
Effects to target plants (efficacy testing)	NO
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	NO
Mixtures including non-BLM herbicides	yes
Marine receptors	No

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	Yes
Mixtures of any of the five herbicides	No
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes - not stats N.R.
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2? yes

Additional comments regarding acceptance/rejection:  
 single & mixture studies  
 rank: med

**Task 2: Data Evaluation**

Reviewer/Date:	AJW 10/8/03
Partial Title of Paper/Report:	Toxicity evaluation of single and mixed anti-fouling...

Herbicides tested:	diuron degradation products (1-(3,4-dichlorophenyl) methylurea & 1-(3,4-dichlorophenyl) urea
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Selenastrum capricornutum Daphnia magna		
Life Stage:	24h old - magna cells → algae		
Duration:	48h - magna 72h - algae		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	Highest purity available
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	
Test System (e.g., flow-thru, mesocosm, etc.):	

n=6 D.M. n=5 S.C. Test System Monitoring	
Dissolved Oxygen:	Conductivity:
Temperature: D.M. 20±1°C at Sc. 25°C	Organic Carbon (D or T):
pH:	Ammonia:
Other ( )::	Other ( )::
Other ( )::	Other ( )::

Endpoint	Diuron mg/L		Biological and Statistical Endpoints mg/L		
	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival S.C.	0.045			0.015	
Growth D.M.	8.6			3.5	
Reproduction		1-(3,4-DCP)methylurea		1-(3,4-DCP) urea	
Embryo/Larval Develop.	SC. 0.058			0.04	
	EC50 D.M. 0.074			14.9	

Degradates/Inerts:	
Additional Comments and Observations:	<p>- also used Microtox (excluded)</p> <p>- magna used OECD guideline 202</p> <p>- algae " " " " 201</p> <p>LOEC = initial toxicity threshold of a chemical - not sure if they were determined statistically</p>

\* - used test kits for algae & magna

Reviewer/Date:	NZN 10/8/03
Title of Paper/Report:	Application of QSARs to predict potential aquatic toxicities of organochlorine pesticides
Author(s)	Piedler et al
Journal/Year/Vol:Pages	Toxicol Environ Chem 1989 1990 26:157-160

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes not conducted ↓ yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	
diuron NO new tox data, modeling (tox data present - from aquire(?)) (LC50s) for fish - not even mention what kind	

BLM National Vegetation EIS

Literature Review Form

Reviewer/Date:	R3N 10/8/03
Title of Paper/Report:	Laboratory-derived acute toxicity of selected pesticides to <i>G. dubia</i>
Author(s)	Foster, Thomas, Korth
Journal/Year/Vol:Pages	Australasian J. Ecotox 1998 4:53-59

Task 1: Application of Selection Criteria

A. Indicate if the paper meets these exclusion criteria

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

B. Issues to be emphasized

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	5
Chronic effects (e.g., reproductive) that may affect populations	Na
Inerts, degrades, metabolite effects	↓
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

C. Other Criteria

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes - ?

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection: High Ranking	

**Task 2: Data Evaluation**

Reviewer/Date:	P-2N 10/8/03
Partial Title of Paper/Report:	Laboratory-derived acute toxicity...

Herbicides tested:	bromacil diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Ceriodaphnia dubia		
Life Stage:	< 24h		
Duration:	48h		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	2 water types culture / natural
Test Concentrations (if appropriate):	0.5 dil series
Test System (e.g., flow-thru, mesocosm. etc.):	Static

Test System Monitoring				
	DMW MQS	Supply	DMW MQS	Supply
Dissolved Oxygen:			71-76	93-120
Temperature:				
pH:	7.3-8.2	7.0-9.9		
Other ( Ca mg/L):	12.3-15.7	6.3-36.7		
Other ( Mg mg/L):	0.3-0.48	3.4-52.8		
			Other ( turbidity ): NTU	0
			Other ( hardness ) mg/L	32-41
				3-56
				19-308

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	75 (63-88)	65 (56-75)	mg/L		
Growth	1.0 (0.9-1.1)	1.7 (1.5-2.0)	↓		
Reproduction	Supply ↑	2 DMW MQS			
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>methods based on EPA 91</li> <li>TSK method for EC50</li> <li>measured concs used for calc of EC50</li> </ul>

Reviewer/Date:	PNW 10/12/03
Title of Paper/Report:	Ecotoxicological thresholds levels of a mixture of herbicides (atrazine, diuron, and metolachlor) in freshwater microcosms
Author(s)	Hartgers et al
Journal/Year/Vol:Pages	Aquat Ecol. 1998 32: 135-152

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓ YES NO
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	4
Chronic effects (e.g., reproductive) that may affect populations	4
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	1 ↓
Indirect effects (food supply, cover)	yes

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated ↓ yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2? No

Additional comments regarding acceptance/rejection:

tox data present EC50s for algae (*Skeletonema costatum*) mixture of 3 pesticides (2 non-BLM) atrazine, metolachlor & diuron  
 but from P.C. - no data to review  
 Microcosm Study

Reviewer/Date:	R3N 10/11/03
Title of Paper/Report:	The impact of the herbicide durgin on photosynthesis in three species of tropical seagrass
Author(s)	Haynes et al
Journal/Year/Vol:Pages	Marine Poll. Bull. 2000 41: 7-12

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	NO
Inerts, degradates, metabolite effects	NO
Mixtures of any of the five herbicides	4
Indirect effects (food supply, cover)	4 2

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes (n=2)
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	mod ranking seawater

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/11/03
Partial Title of Paper/Report:	The impact of the herbicide diuron on photosyn...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	tropical seagrass (Australia)
Test Species:	Halophila ovalis	Cymodocea serrulata	Zostera capricorn
Life Stage:			
Duration:	5 d exposure period / 5 d recovery period		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	seawater
Test Concentrations (if appropriate):	0, 0.1, 1.0, 10 + 100 µg/L
Test System (e.g., flow-thru, mesocosm, etc.):	50L glass aquaria

Test System Monitoring	
Dissolved Oxygen:	
Temperature:	20°C - 35°C
pH:	8.13 - 8.42
Other (Salinity):	32.6 - 39.4 ppt
Other ( )::	
Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	Chlorophyll		1.0	10.0	- for all 3 sp @ DS
Growth			(~0.95) measured	(~7.3) measured	
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	- acclimated 24h prior to experimentation - measured conc see p1 (p289) - env pt chlorophyll fluorescence - stats

Reviewer/Date:	K3N 10/11/03		
Title of Paper/Report:	Comparative dietary toxicities of pesticides to birds		
Author(s)	Heath Heath et al		
Journal/Year/Vol:Pages	Book Report	1972	No: 152 1-57

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	5
Chronic effects (e.g., reproductive) that may affect populations	2
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	No - internal review

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	USPW pub

mod-high ranking

**Task 2: Data Evaluation**

Reviewer/Date:	LJS 10/11/03
Partial Title of Paper/Report:	Comparative dietary toxicities of pesticides...

Herbicides tested:	diquat diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: pheasants (phasianus edithae)	
Test Species:	bobwhites quail (Colinus virginianus) mallard (Anas platyrhynchos) Japanese quail (Coturnix coturnix)		
Life Stage:	2-3 wk old birds		
Duration:	5d exposure to diet / 3d extra for observation		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	diet (ad libitum) mixed w/ corn oil or 100% glycol
Test Concentrations (if appropriate):	6 cones spaced geometrically
Test System (e.g., flow-thru, mesocosm, etc.):	

1 pen / conc w/ 6-15 birds depending on availability

Test System Monitoring	
Dissolved Oxygen:	Conductivity:
Temperature:	Organic Carbon (D or T):
pH:	Ammonia:
Other ( )::	Other ( )::
Other ( )::	Other ( )::

Endpoint	Biological and Statistical Endpoints				
	LC50/EC50	IC (LC50)	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival CV	715	1730			
Growth CL	333	> 5000 (14% mort)			
Reproduction PC	634	> 5000 (33% mort @ 4200, repellent @ 5000)			
Embryo/Larval Develop AP	510	> 5000 (30% mort)			

Degradates/Inerts:	
Additional Comments and Observations:	acclimated to undosed diet - stats mentioned

Reviewer/Date:	RZW 10/13/03
Title of Paper/Report:	In situ chemical inhibition of benthic diatom growth affects recruitment of competing, permanent and temporary mesofauna
Author(s)	Hertschel & Turner
Journal/Year/Vol:Pages	Limnol Oceanogr 1994 39: 816-839

Task 1: Application of Selection Criteria

A. Indicate if the paper meets these exclusion criteria

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓ No
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	↓
Effects to target plants (efficacy testing)	↓
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	↓
Mixtures including non-BLM herbicides	↓
Marine receptors	yes

B. Issues to be emphasized

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	4
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	4
Indirect effects (food supply, cover)	5

C. Other Criteria

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	Marine - in situ effect on diatoms as food sources for oligo & poly chaetes lab

**Task 2: Data Evaluation**

Reviewer/Date:	NRN 10/13/03
Partial Title of Paper/Report:	In situ chemical inhibition of benthic diatoms

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: diatom & ?	
Test Species:	indirect effect on + polyphagous		
Life Stage:	Hobsonia Florida		
Duration:	59 d		

Exposure Conditions	
Formulation:	NR
Concentration/amount of active ingredient:	NR
Medium (water, food, soil, etc.):	sediment porewater based w/ diffusion chamber
Test Concentrations (if appropriate):	$2 \times 10^{-4}$ M (High) & $2 \times 10^{-6}$ M (low) + control
Test System (e.g., flow-thru, mesocosm, etc.):	in situ (intertidal sandflat)

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	diatom's abundances		low	high	days 17, 27, 41
Growth			low	high	days 11, 17, 27, 31, 45
Reproduction	juveniles + A. leydigii		high	>high	
Embryo/Larval Develop.	adults H. Florida		low	high	days 4, 31, 41

Degradates/Inerts:	NR
Additional Comments and Observations:	- states reported - did not discuss analytical - measured vs nominal?  not rank (no analytical)

Reviewer/Date:	RZN 10/13/03
Title of Paper/Report:	Lethal dietary toxicities of environmental pollutants to birds
Author(s)	Hill et al
Journal/Year/Vol:Pages	OSFWS Special Scientific Rpt 1975 #191: 1-61

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated ↓
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection: Same data as in Heath 1972	

Reviewer/Date:	RZN 10/14/03
Title of Paper/Report:	tetrachloroazobenzene in 3,4-dichloroaniline and its herbicidal derivatives: propanil, diuron, linuron, and neburon
Author(s)	Hill et al
Journal/Year/Vol:Pages	Arch Environ Health 58: 36:11-14

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ Yes
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	yes
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	No

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	No evaluation
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes	No
Additional comments regarding acceptance/rejection:		

skin test diuron + tetrachloroazobenzene (34 + 43 mg/m) 28 mg/kg  
 mod ranking

**Task 2: Data Evaluation**

Reviewer/Date:	RZW 10/11/03
Partial Title of Paper/Report:	Tetrachlorazobenzene in 3,4-dichloroaniline

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Rabbit	
Test Species:	New Zealand rabbits		
Life Stage:	adult females		
Duration:	14-22 d after first treatment		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	sol'n
Test Concentrations (if appropriate):	applied daily for 5d
Test System (e.g., flow-thru, mesocosm, etc.):	

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth					
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	

Reviewer/Date:	LEN 10/12/03
Title of Paper/Report:	A review of the literature on the use of dieldrin in fisheries
Author(s)	Johnson & Julin
Journal/Year/Vol:Pages	Bureau of Sport Fisheries and Wildlife 1974

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	4
Chronic effects (e.g., reproductive) that may affect populations	NO
Inerts, degradates, metabolite effects	↓
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	NO
Was the test of proper exposure dose, mechanism, & duration?	NA
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	NO
Were proper controls used and was control performance acceptable?	NA
Are the data presented in a peer-reviewed journal?	NO internal review

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection: See table 2 summary rpt presents data from literature - no new data Missing some of pag 95	

Reviewer/Date:	LRW 10/13/03
Title of Paper/Report:	Effects of diuron on the energy budget of a <i>Daphnia magna</i> population
Author(s)	Karsting K
Journal/Year/Vol:Pages	Proceedings of the Swedish-Netherlands symposium, Wageningen, Netherlands, Elsevier Scientific Publishing Co 159-166 1975

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	 ↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	3
Inerts, degradates, metabolite effects	No
Mixtures of any of the five herbicides	No
Indirect effects (food supply, cover)	yes

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	No
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	No
Were proper controls used and was control performance acceptable?	! data presented as 2 of control
Are the data presented in a peer-reviewed journal?	!

Should evaluation of this paper continue in Task 2?	yes NO
Additional comments regarding acceptance/rejection:	<p>microcosm weak exp design, insufficient info</p> <p>no stats, no analy</p>

**Task 2: Data Evaluation**

Reviewer/Date:	WJS 10/13/03
Partial Title of Paper/Report:	Effects of diuron on the energy budget of a...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	algae
Test Species:	Daphnia magna	Chlorella vulgaris	
Life Stage:			
Duration:	~3 wks		

Exposure Conditions	
Formulation:	87% granulate (AA Karmex 87% granulate)
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	0, 0.5, 4.0 mg/L
Test System (e.g., flow-thru, mesocosm. etc.):	static microcosm (aquarium ~ 2L)

Test System Monitoring	
Dissolved Oxygen:	Conductivity:
Temperature: 18°C	Organic Carbon (D or T):
pH:	Ammonia:
Other (photosynth): 14h light : 10h dark	Other ( )::
Other ( )::	Other ( )::

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth					
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>empt caloric value</li> <li>maps, exp design not described</li> <li>no stats</li> <li>final biomass (% of control) ↓ @ 4 mg/L</li> </ul>

Reviewer/Date:	RGN 10/13/03
Title of Paper/Report:	The use of microsystems for the evaluation of the effect of toxicants
Author(s)	Kersting
Journal/Year/Vol:Pages	Hydrobiol Bull 1975 19:102-108

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓ ↓ ↓ ↓ ↓ ↓ ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	0
Chronic effects (e.g., reproductive) that may affect populations	0
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	0

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes (poorly)
Was the test of proper exposure dose, mechanism, & duration?	NO
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	NO
Were proper controls used and was control performance acceptable?	No
Are the data presented in a peer-reviewed journal?	? yes

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	

duration

microcosm, improper design (1 ft), problems w/ controls, nominal conc, no stats measurements (counts) of algae & magna over time

Reviewer/Date:	R3W 6/12/03 DDP 4-674
Title of Paper/Report:	Teratogenicity studies on pesticide formulations of dimethoate, duron, and lindane in rats
Author(s)	Khera et al
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 1979 22:522-529

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	
Effects to microorganisms	NO
Genotoxic effects (mutagenic, carcinogenic)	↓
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	YES teratogenicity; other data well
Effects to target plants (efficacy testing)	NO
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	↓

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	<del>3</del> 3
Chronic effects (e.g., reproductive) that may affect populations	2
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	NO / yes
Additional comments regarding acceptance/rejection:	exclusion criteria - terat & but other tox data (fetal wt)

**Task 2: Data Evaluation**

Reviewer/Date:	V-3W
Partial Title of Paper/Report:	Teratogenicity study on pesticide formulations of...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Female Wistar rats 175-200g		
Life Stage:	adult		
Duration:	22d		

Exposure Conditions	
Formulation:	Karmex <sup>+</sup>
Concentration/amount of active ingredient:	80% diuron
Medium (water, food, soil, etc.):	corn oil - vehicle
Test Concentrations (if appropriate):	125, 250, 500 mg/kg formulated diuron
Test System (e.g., flow-thru, mesocosm, etc.):	corn oil - administered 1x daily

n=20 mated females / exp. group

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth					
Reproduction					
Embryo/Larval Develop.					

500 mg/kg - LOEC for fetal wt  
 250 mg/kg NOEC  
 125 mg/kg for Anomalous Fetuses & litters

Degradates/Inerts:	
Additional Comments and Observations:	<p>- control group reported - treated same as rats.</p> <p>- stats performed w/ student t-test → <u>not appropriate</u></p> <p>stat diff seen for fetal wt (above) but</p> <p>not for # pregnant, # of corpora lutea per pregnancy, # of live fetuses, # dead or resorbed fetuses</p> <p>should use multiple com test eg. Dunnett</p>

Reviewer/Date:	NBN 10/12/03
Title of Paper/Report:	Effects of new antifouling compounds on the development of sea urchin
Author(s)	Kobayashi & Okamura
Journal/Year/Vol:Pages	Marine Poll Bull

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ Yes
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes, not very detailed
Was the test of proper exposure dose, mechanism, & duration?	N.R.
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	? ? N.L.
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	- Low rank data not very well described/present

**Task 2: Data Evaluation**

Reviewer/Date:	AJW 10/12/03
Partial Title of Paper/Report:	Effects of new antifouling compounds on the development of...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Sea urchin	
Test Species:	Hemionotus pulcherrimus Anthocidaris crassispina		
Life Stage:			
Duration:			

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	stock 10,000 mg/L in DMSO
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	
Test System (e.g., flow-thru, mesocosm, etc.):	

Test System Monitoring	
Dissolved Oxygen:	
Temperature:	22°C day 19°C night
pH:	
Other ( )::	
Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth (development)			length		
Reproduction			length	organism?	
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<p>- no analytical discussed</p> <p>- no diuron data presented - others are - likely because little effect</p> <p>- low rank</p>

Reviewer/Date:	RJN 10/12/03
Title of Paper/Report:	Effect of diuron, dibar, methyl nitrophenols on chironomids
Author(s)	Korostylev
Journal/Year/Vol:Pages	Khozystva 121:161-164 1977

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?

Additional comments regarding acceptance/rejection:

LC50s reported in abstract in Russian could not verify  
1.8 mg/L (144h)

Reviewer/Date:	Pillard / 5-17-03 RSN
Title of Paper/Report:	Acute toxicity of 12 herbicides to the green algae - - -
Author(s)	J. Ka & W. Liang
Journal/Year/Vol:Pages	Bull Environ. Contam Toxicol / 2001 / 67:347-351

Task 1: Application of Selection Criteria

A. Indicate if the paper meets these exclusion criteria

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	Yes (algae)
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

B. Issues to be emphasized

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	3
Inerts, degradates, metabolite effects	1
Mixtures of any of the five herbicides	1
Indirect effects (food supply, cover)	1

C. Other Criteria

Issue	Indicate Yes or No
Are corroborating studies described?	
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	Yes

Should evaluation of this paper continue in Task 2?	<del>Yes</del> No
Additional comments regarding acceptance/rejection:	Deals only w microorganisms - no apparent data on specific target herbicides !!

Reviewer/Date:	DZNS 6/13/03
Title of Paper/Report:	Toxicity of 40 herbicides to the green alga <i>Chlorella vulgaris</i>
Author(s)	Ma et al 2002
Journal/Year/Vol:Pages	Ecotox Environ Safety 2002 51:128-132

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ algae ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	2 growth
Inerts, degradates, metabolite effects	na
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	2 growth

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	nomine

low mod rank

**Task 2: Data Evaluation**

Reviewer/Date:	AJW 10/13/03
Partial Title of Paper/Report:	Toxicity of 40 herbicides to the ...

Herbicides tested:	cluron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: algae	
Test Species:	Chlorella vulgaris		
Life Stage:			
Duration:	96h		

Exposure Conditions	
Formulation:	50% WP
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	liquid
Test Concentrations (if appropriate):	0 - 150 mg/L
Test System (e.g., flow-thru, mesocosm. etc.):	static 50 ml Erlenmeyer flask

A=3

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( shaker ):	100 rpm	Other ( )::	
Other ( light ):	CONTINUOUS 5000 lx/cm	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	4.3 mg/L				
Growth	1.84 x 10 <sup>-8</sup> mol/L				
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- controls used</li> <li>- stats EC50 linear reg.</li> <li>- solvents used - below acceptable levels</li> <li>- no analytical discussed/presented</li> </ul>

Reviewer/Date:	KZM 10/13/03
Title of Paper/Report:	Acute toxicity of 33 herbicides to the green alga <i>Chlorella pyrenoidosa</i>
Author(s)	Ma et al
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 2001 66:536-541

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ algae ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	2 NA growth
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	2 growth

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	

Low-mid rank

**Task 2: Data Evaluation**

Reviewer/Date:	NSN 10/13/03
Partial Title of Paper/Report:	Acute toxicity of 33 herbicides to the...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Algae - green	
Test Species:	Chlorella pyrenoidosa		
Life Stage:	cells		
Duration:	96 h		

Exposure Conditions	
Formulation:	5070 WP
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	0-50 mg/L
Test System (e.g., flow-thru, mesocosm, etc.):	50 ml Erlenmeyer flasks static

n=3

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (shaker):	100 rpm	Other ( )::	
Other (light):	continuous 5000 lux/cm <sup>2</sup>	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth	growth 1.3 x 10 <sup>-3</sup> mg/L				
Reproduction	" 5.59 x 10 <sup>-4</sup> M				
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- controls mentioned</li> <li>- stats used to</li> <li>- solvent: acetone, methanol, d H<sub>2</sub>O</li> <li>- nominal (no analytical discussed)</li> </ul>

Reviewer/Date:	R3N 10/13/03
Title of Paper/Report:	Differential sensitivity to 30 herbicides among populations of two green algae <i>Scenedesmus obliquus</i> and <i>Chlorella pyrenoidosa</i>
Author(s)	Ma
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 2002 68:275-281

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	algae
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	2 growth
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	2 growth

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	
<p>nominal conc.</p> <p>Low-mol rank</p> <p><i>Chlorella pyrenoidosa</i> already presented in Ma et al 2001</p>	

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/13/03
Partial Title of Paper/Report:	Differential sensitivity to 30 herbicides among...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Scenedesmus obliquus		
Life Stage:			
Duration:	96 h		

Exposure Conditions	
Formulation:	50% WP
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	0 - 150 mg/L
Test System (e.g., flow-thru, mesocosm, etc.):	static 50 ml Erlenmeyer flasks n=3

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (stirrer):	100 rpm	Other ( )::	
Other (light intensity):	5000 lux/cm <sup>2</sup>	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
Growth	$4.09 \times 10^{-3}$ mg/L				
Reproduction	$1.75 \times 10^{-8}$ M				
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>controls included</li> <li>EC50 stats - linear regression</li> <li>solvents used to dissolve herb. (acetone, MeOH + d. H<sub>2</sub>O)</li> </ul>

Reviewer/Date:	R3W 12/13/03
Title of Paper/Report:	Topical toxicity of pesticides used in Virginia vineyards to the predatory mite, Neoseiulus fallacis (Parma)
Author(s)	Metzger & Pfeiffer
Journal/Year/Vol:Pages	J Entomol. Sci 2002 37:329-337

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with )	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓ mite build catr for spider mit
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes?

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	low rank - nominal conc - endpts as mg/L?

**Task 2: Data Evaluation**

Reviewer/Date:	1232 to 10/13/03
Partial Title of Paper/Report:	Paper Toxicity of pesticides used in Virginia vineyards...

Herbicides tested:	duroton
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Mite	
Test Species:	Neoseiulus fallacis (Garman) (Acari: Phytoseiidae)		
Life Stage:	adult		
Duration:	48h		

Exposure Conditions	
Formulation:	Karmex DF
Concentration/amount of active ingredient:	240 g rate/100L = 300g
Medium (water, food, soil, etc.):	liquid
Test Concentrations (if appropriate):	
Test System (e.g., flow-thru, mesocosm, etc.):	

n=100

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	21-24°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints				
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC + LOEC	Other ( )
Mortality/Survival			13.1	@ 48h n.s. from control
Growth				
Reproduction				
Embryo/Larval Develop.				
				Note: think it is mg/L but p.p.

Degradates/Inerts:	
Additional Comments and Observations:	- slide-dip assay - 1 cont. concentration - stats described ANOVA followed by Tukey's

Reviewer/Date:	AJW 10/14/03
Title of Paper/Report:	Combined effects of tri-n-butyl tin (TBT) and diuron on marine periphyton communities detected as pollution-induced community tolerance
Author(s)	Molander et al
Journal/Year/Vol:Pages	Aqua Environ Contam Toxicol 1992/22:419-427

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	periphyton
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	yes (TBT)
Mixtures including non-BLM herbicides	↓
Marine receptors	yes

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	1

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes ECRS
Were proper controls used and was control performance acceptable?	yes ?
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	
Marine Microcosm low - mod mark	

**Task 2: Data Evaluation**

Reviewer/Date:	KZN 10/14/03
Partial Title of Paper/Report:	combined effects of tri-n-butyl tin (TBT) and...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: marine periphyton	
Test Species:			
Life Stage:			
Duration:	4 wks		

Exposure Conditions	
Formulation:	99% purity Pestanal-quality Agedel-6H
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	5 conc 3.2 nM - 1 μM
Test System (e.g., flow-thru, mesocosm, etc.):	microcosm

n=4

26 discs

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	10 nM		carbon incorporation		
Growth					
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- measure concs 65-100% of nominal</li> <li>- water in microcosms from field</li> <li>- periphyton biomass - chl a</li> <li>- copepod abundance</li> <li>- photosynthesis inhibition</li> </ul>

Reviewer/Date:	MBN 10/14/03
Title of Paper/Report:	Acute toxicities of selected herbicides to fingerling channel catfish, <i>Ictalurus punctatus</i>
Author(s)	McCorkle et al
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 1977/18:267-270

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes - briefly
Was the test of proper exposure dose, mechanism, & duration?	No - screen study
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	No
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	<p>low ranking</p> <ul style="list-style-type: none"> <li>- nominal concs</li> <li>- 2 tested exp concs.</li> <li>- insufficient methods</li> </ul>

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/14/03
Partial Title of Paper/Report:	Acute toxicities of selected herbicides to...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Ictalurus punctatus (channel catfish)		
Life Stage:	1 yr old 14g / 12cm		
Duration:	<del>96h</del> 48h		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	2 concs + 10 mg/L static
Test System (e.g., flow-thru, mesocosm, etc.):	Static 76L glass aquaria 5 fish/aq

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	20-21°C	Organic Carbon (D or T):	
pH:	8.2	Ammonia:	
Other (alk):	80 mg/L	Other (hard):	22 mg/L
Other (TSS):	133 mg/L	Other (Fe):	0.1 mg/L

Biological and Statistical Endpoints				
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC Other ( )
Mortality/Survival	10 mg/L		10 mg/L > 10 mg/L	
Growth				
Reproduction				
Embryo/Larval Develop.				

Degradates/Inerts:	
Additional Comments and Observations:	- concs based on a.i. - screening study (2 concs)

- RPNs N.R.  
- analytical not N.R. - likely nominal conc.

Reviewer/Date:	RZN 10/14/03
Title of Paper/Report:	The effects of temperature on the susceptibility of bluegills and rainbow trout to selected pesticides
Author(s)	Macek et al
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 1969 4: 174-183

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	3
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	

mod mark

**Task 2: Data Evaluation**

Reviewer/Date:	RZNS 10/14/03
Partial Title of Paper/Report:	The effects of temperature on the susceptibility of bluegills and rainbow trout to selected pesticides

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	bluegill ( <i>Lepomis macrochirus Rafinesque</i> )		
Life Stage:	0.6-1.5g		
Duration:	96h		

Exposure Conditions	
Formulation:	(Farmex) Diuron
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	RBT
Test System (e.g., flow-thru, mesocosm, etc.):	-static <del>reservoir</del> 15L glass jars

n=2, 10/jar

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	see below	Organic Carbon (D or T):	
pH:	7.1	Ammonia:	
Other (ALK):	35 mg/L	Other (30 mg/L):	CaSO <sub>4</sub> + MgSO <sub>4</sub>
Other ( )::		Other ( )::	

Endpoint	Biological and Statistical Endpoints				
	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	8700 mg/L	12.7°C			
Growth	7600	18.3°C			
Reproduction	5900	23.8°C			
Embryo/Larval Develop.					

TL50 96h

Degradates/Inerts:	
Additional Comments and Observations:	RBT temps @ 1.6°, 7.2° + 12.7° bluegill temps @ 12.7°, 18.3, 23.8°C measured concs - didn't see these acclimating to conditions 48h also have 24h data

Reviewer/Date:	AZN 10/13/03
Title of Paper/Report:	short-term response and recovery of <i>Zostera capricorni</i> photosynthesis after herbicide exposure
Author(s)	Macinnis-Ng & Ralph
Journal/Year/Vol:Pages	Aquat Botany 2003 76:1-15

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ ↓ ↓ ↓ ↓ ↓ ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	1

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	
nominal conc low-mod rank	

**Task 2: Data Evaluation**

Reviewer/Date:	ASN 10/17/03
Partial Title of Paper/Report:	short-term response and recovery of Zostera...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Seagrass	
Test Species:	Zostera capricorni		
Life Stage:	sprigs		
Duration:	10h + 4d recovery		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	0, 10 + 100 mg/L
Test System (e.g., flow-thru, mesocosm, etc.):	1050 L aquaria

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (Salinity):	35 ppt	Other ( )::	
Other (Light):	150 μmol photons m <sup>-2</sup> s <sup>-1</sup>	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	ChlA		10	100	@ 10h Table 2
Growth	lab / Max quantum yield (ChlA fluorescence)		0	10	@ 2 + 10h Table 1
Reproduction	effective quant yield		0	10	
Embryo/Larval Develop.	field MRY		0	10	@ 2h but
	" "		10	100	@ 10h field

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>2 month acclimation</li> <li>location Australia</li> <li>measured fluorescence</li> <li>describe stats</li> </ul> <p style="text-align: right;">lab + in situ studies</p>

Reviewer/Date:	HZN 10/14/03
Title of Paper/Report:	Chronic effects of the herbicide diuron on freshwater, Cladocerans, amphipods, Nudges, minnows, worms, and snails
Author(s)	Nebeker & Schuytema
Journal/Year/Vol:Pages	Arch Environ Contam Toxicol 1998 35:441-446

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NA
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	4
Chronic effects (e.g., reproductive) that may affect populations	3
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	

- missing conc.  
 - static / semistatic sol'n's  
 mod-high rank

Task 2: Data Evaluation

Reviewer/Date:	R3N 6/14/03
Partial Title of Paper/Report:	Chronic effects of the herbicide diuron on freshwater r...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Lumbriculus variegatus Physa gyrina	
Test Species:	Daphnia pulex	Hyalella azteca	Chironomus tentans Pimephales promel
Life Stage:	D.p. 5d old,	H.a. 2-3d old,	C.t. 2d old 1st instar, PP el eggs (2.5d old)
Duration:	7/10d	PP juvenile 1.5 months old	Pg - 15d old

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	6-7 cones
Test System (e.g., flow-thru, mesocosm, etc.):	static static-renewal

n=3

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	~ 75 µS/cm
Temperature:	10/22/24	Organic Carbon (D or T):	
pH:	~ 6.8	Ammonia:	
Other (hard):	23-24 mg/L	Other ( )::	
Other (alk):	25-26 mg/L	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival D.p.	17.9 mg/L 96h		4.0	7.7	
Growth D.p.	7.1 mg/L 7d		4.0	7.7	no report mort
Reproduction H.a.	19.4 mg/L 96h				
Embrvo/Larval Develop H.a.	18.4 mg/L 96h	10d	7.9	15.7 mg/L	
C.t.	33 mg/L 10d		3.4	7.1	cf. growth
juvenile P.p.	27.1 mg/L 10d		1.9	3.4	cf. mortality
P.p.	27.1 mg/L 10d		23.4 mg/L	3.4	growth
Degradates/Inerts: embryo P.p.	11.7 mg/L 7d		4.2	8.3	growth
Additional Comments LV and Observations: Pg.		→ 10d	1.8	3.5	growth
		→ 10d	13.4	22.8 mg/L wt	

See Table 8 P 444

-cones measured at TO

Reviewer/Date:	RBJ 10/15/03
Title of Paper/Report:	Changes in erythropoietic activity of <i>Saprotherodon mossambicus</i> exposed to sublethal concentrations of the herbicide diuron
Author(s)	Reddy et al
Journal/Year/Vol:Pages	Bull Environ Contam Toxicol 1992 49: 730-737

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	Na ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated ↓
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection: how diuron affects blood cells of S.or. adapts: RBCs, hemoglobin & packed cell vol.	

Reviewer/Date:	RZN 10/15/03
Title of Paper/Report:	Relative toxicities of chemicals to the earthworm <i>Eisenia foetida</i>
Author(s)	Roberts & Dorough
Journal/Year/Vol:Pages	Environ Toxicol Chem 1984 3: 67-78

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ ↓ ↓ ↓ ↓ ↓ ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2? yes

Additional comments regarding acceptance/rejection: no chemical analysis presented  
dermal exposure  
mod target rank

**Task 2: Data Evaluation**

Reviewer/Date:	NSN 10/15/03
Partial Title of Paper/Report:	Relative toxicities of chemicals to the earthworm

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Earthworm	
Test Species:	Eisenia foetida		
Life Stage:	adult	370-450 mg	100 worms / conc
Duration:	48h		

Exposure Conditions	
Formulation:	Technical of analytical grade - corrected to 100% a.s.
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	filter paper - loose filter paper
Test Concentrations (if appropriate):	5-7 geometric series 0.1-1000 µg/cm <sup>2</sup>
Test System (e.g., flow-thru, mesocosm, etc.):	dermal

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other (Photosynth):	24h dark	Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	>1000 µg/cm <sup>2</sup>				
Growth					
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	- (acetone)...
Additional Comments and Observations:	- solvent + chemical applied (1ml) to paper - allowed to dry - add 1ml water to paper before adding worms - slats conducted - nominal conc.?

**BLM National Vegetation EIS**

**Literature Review Form**

Reviewer/Date:	RJW 10/15/03
Title of Paper/Report:	Developments in the use of herbicides for the control of aquatic macrophytes
Author(s)	Robson
Journal/Year/Vol:Pages	Water Treatment & Examination 1969 327-337 18(4)

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	not evaluate ↓
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection: slight review no new data Robson	

Reviewer/Date:	RZN 10/16/03
Title of Paper/Report:	Behavioral responses to Atrazine and diuron in Gold fish
Author(s)	Staglio & Trijasse
Journal/Year/Vol:Pages	Arch Environ Contam Toxicol 1998 35:484-491

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1 No NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	behavioral studies / no confirmatory analytical

low-med rank

**Task 2: Data Evaluation**

Reviewer/Date:	HBJ 10/16/03
Partial Title of Paper/Report:	Behavioral responses to atrazine and diuron in ...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Goldfish	
Test Species:	Carassius auratus		
Life Stage:	6-8 cm (length) 6-9 g (wt)		
Duration:	24h / 10 min		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	99% purity
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	24h - 0.5, 5, 50 µg/L / 10 min - 0.1, 1 + 10 µg/L
Test System (e.g., flow-thru, mesocosm, etc.):	static

Test System Monitoring			
Dissolved Oxygen:	8.98 mg/L	Conductivity:	
Temperature:	16.77.6 °C	Organic Carbon (D or T):	
pH:	7-7.3	Ammonia:	
Other ( ): 14h light		Other ( ):	
Other ( ):		Other ( ):	

5 fish/time / x4

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	burst swimming		5 µg/L	50 µg/L	24h exposure static
Growth	sheltering		50 µg/L	250	
Reproduction	surfacing		50 µg/L	250	↓
Embryo/Larval Develop.	burst swimming		< 0.1 mg/L	0.1	flowing sol'n
	attraction		1.0 mg/L	10	↓
	surfacing		10	> 10	
	grouping		10	> 10	
	sheltering		10	> 10	↓

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- acclimated 1 mo prior to testing</li> <li>- solvent (acetone 20 µg/L)</li> <li>- blind test</li> </ul>

No analytical (diuron) except for culture/holding water

Reviewer/Date:	VSW 10/16/03
Title of Paper/Report:	Biotefts using unicellular algae and ciliates for predicting long-term effects of toxicants
Author(s)	Schäfer et al
Journal/Year/Vol:Pages	Ecotox & Environ Safe 1994 27:64-81

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ algae ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	2
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	2

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	
Nominal conc. low-mod rank	

**Task 2: Data Evaluation**

Reviewer/Date:	RBN 10/16/03		
Partial Title of Paper/Report:	Biotests using unicellular algae and ciliates for predicting		
Herbicides tested:	Bromacil Diuron		
20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other <del>Algae</del> Algae green	Ciliates <del>pyriform</del>
Test Species:	Scenedesmus subspicatus Chlamydomonas reinhardtii Tetrahymena		
Life Stage:			
Duration:	72h - static		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	2
Medium (water, food, soil, etc.):	alga media
Test Concentrations (if appropriate):	
Test System (e.g., flow-thru, mesocosm. etc.):	static

N=3

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	20°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (light):	8000 lux	Other ( )::	
Other (shaker):	low speed	Other ( )::	

Endpoint	72h Biological and Statistical Endpoints				
	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	SS 0.097		0.024 / 0.0485		Bromacil (mg/L)
Growth			24h 72h		
Reproduction	SG 0.036		0.007 / 0.010		Diuron
Embryo/Larval Develop.					

endpt  
get  
72h test

Degradates/Inerts:	
Additional Comments and Observations:	- data presented as nominal concs

Reviewer/Date:	DLBN 10/16/03
Title of Paper/Report:	Comparative toxicity of diuron on survival and growth of Pacific treefrog, bullfrog, red-legged frog, and African clawed
Author(s)	Frog embryos and tadpoles Schuytema & Nebelcer
Journal/Year/Vol:Pages	Arch Environ Contam Toxicol 1998 34:370-376

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NO ↓ Some deformity end. ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	3
Chronic effects (e.g., reproductive) that may affect populations	2
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	↓

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2? yes

Additional comments regarding acceptance/rejection:

Various enrpts: lethal & sublethal

mod high mark

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/16/03
Partial Title of Paper/Report:	Comparative toxicity of diuron on survival and growth...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Frogs	
Test Species:	Pacific treefrog Pseudacris regilla	bullfrog Rana catesbeiana	red-legged frog Rana aurora
Life Stage:	just hatched P.C. - embryos & tadpoles	P.C. embryo-stage 12 tadpoles - 17d post hatch	
Duration:	embryo - 10 d tadpole ~ 14d, 60d post-exposure	30d " same stage	

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	0.5, 1.9, 3.8, 7.6, 14.5, 29.1 mg/L
Test System (e.g., flow-thru, mesocosm, etc.):	Static-renewal

n=3(E) 10/14(E)

Test System Monitoring			
Dissolved Oxygen:	7.0	Conductivity:	194.6
Temperature:	E 20°C T 20/24	Organic Carbon (D or T):	
pH:	7.4	Ammonia:	
Other (hard):	72.4	Other ( )::	
Other (alk):	63.5	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	EC(21d)LC50	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	15.2 mg/L		14.5 mg/L	21.0	4+ 14d, for dry wt 21+7
Growth		12.7 mg/L	7.6	14.5	21d, dry wt
Reproduction	22.2 mg/L		7.6	14.5	dry wt wet wt
Embryo/Larval Develop	229.1		14.5 mg/L	29.1	(10d) survival deform
	229.1		29.1	29.1	" deformities survival

tadpoles  
embryos

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>see table 1 for conditions of embryo test w/ P. regilla</li> <li>analytical data used</li> <li>very detailed methods</li> </ul>

- some endpoints above are avg of 2 exp. (Table 3, p 373)

Reviewer/Date:	PJN 10/16/03
Title of Paper/Report:	The influence of biochemical species differences on acute fish toxicity of organic chemicals
Author(s)	Sijm, Flenner & Opperhuizen
Journal/Year/Vol:Pages	Comp Biochem Physiol C 1991/100C:33-35

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	NA ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated ↓
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection:	
duron NO new data presented	

LC50s not even present in document

Reviewer/Date:	KZN 10/16/03
Title of Paper/Report:	Effects of certain herbicides on some insects and spiders found in Louisiana cotton fields
Author(s)	Stam et al
Journal/Year/Vol:Pages	J Econom Entom 1978 71:477-480

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	               ↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes Not Reported
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	

no analytical  
lab + field work

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/16/03
Partial Title of Paper/Report:	Effects of certain herbicides on some insects...

Herbicides tested:	diuron
--------------------	--------

20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: insects	
Test Species:	Lady bugs Cedeomegilla maculata & Scymnus louisianae parasite Eretmocerus halderman		
Life Stage:	2 hemipteran predators Prius insidiosus Geocoris punctipes		
Duration:	lab 48h	field 3 applications observations @ t1d, 2 <sup>nd</sup> applicat & after 3 <sup>rd</sup> application	

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	field 2.530.4571.7 Kg/ha → applied to base of cotton plants or 2.25 lb/acre
Test System (e.g., flow-thru, mesocosm, etc.):	lab: Coat inside of vial w/ 10 ml soln dry, expose <sup>residual filter</sup> or dipping techn submerge for 20s for Cm, GptSI

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	23°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival			2.53 kg/ha	2.5	field
Growth	>10%		10%	710%	lab (GP, Cm, Di)
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	field & lab experiments no analytical

Reviewer/Date:	RJN 10/21/03
Title of Paper/Report:	Phytotoxicity of glyphosate alone and in combination with copper or folpet on duckweed (Lemna minor)
Author(s)	Teisseire, Couderchet & Uernet
Journal/Year/Vol:Pages	Environ Poll 1999 106 39-45

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	duckweed
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	alone but of comb of Cu Folp
Marine receptors	↓

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	2
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	2

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	- nominal concs

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 10/21/03
Partial Title of Paper/Report:	Phytotoxicity of diuron alone and in combination

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: aquatic macrophyte - duckweed	
Test Species:	Lemna minor		
Life Stage:			
Duration:	7d		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	>98% purity
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	nominal 5-100 µg/L a.i.
Test System (e.g., flow-thru, mesocosm, etc.):	Semi-static renewed on day 4 n=3, exp repeated 3x

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	25°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (illumination):	2500 lux	Other ( )::	
Other ( )::		Other ( )::	

Biological and Statistical Endpoints				
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC Other ( )
Mortality/Survival				
Growth		growth IC50 25 µg/L		5 µg/L
Reproduction		inhibition IC50 60		
Embryo/Larval Develop.				

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>end pts: growth, total chlorophyll</li> <li>chlorophyll content increased with diuron conc.</li> <li>concs as nominal (a.i.)</li> </ul>

Reviewer/Date:	FSW 10/21/03
Title of Paper/Report:	Ascorbate and glutathione contents in duckweed Lemna minor as biomarkers of the stress generated
Author(s)	by copper, folpet, and diuron Teisseire & Vernet
Journal/Year/Vol:Pages	Biomarkers 2000 5: 263-273

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	           
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

alone but also w/ Cu folpet + biomarker induction

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	Na biomarkers
Inerts, degradates, metabolite effects	Na
Mixtures of any of the five herbicides	Na
Indirect effects (food supply, cover)	Na

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	- endpts - biomarkers - no direct link w/ fox

Reviewer/Date:	RBN 10/17/03
Title of Paper/Report:	Anti-fouling paint booster biocides in the UK coastal environment and potential risks of biological effects
Author(s)	Thomas et al
Journal/Year/Vol:Pages	Marine Poll Bull 2001 42:677-688

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓ Yes
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	Yes
Marine receptors	No

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA
Chronic effects (e.g., reproductive) that may affect populations	↓
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	↓ Not evaluated
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	survey of diuron cones in harbors/bays in the UK

Reviewer/Date:	R3W 10/12/03
Title of Paper/Report:	Fungal biodegradation of a phenylurea herbicide, diuron: structure and toxicity of metabolites
Author(s)	Tixier et al
Journal/Year/Vol:Pages	Pest Management Sci 2000 56:455-462

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ Soil Fungus
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	2
Inerts, degradates, metabolite effects	3 Biodegradation of parent & metabolites
Mixtures of any of the five herbicides	NA
Indirect effects (food supply, cover)	4

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes
Were proper controls used and was control performance acceptable?	NR
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection: microtox test, metabolism by fungi; analytical confirm high rank	

**Task 2: Data Evaluation**

Reviewer/Date:	RSN 10/17/03
Partial Title of Paper/Report:	Fungal biodegradation of a phenylurea herbicide...

Herbicides tested:	Diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: fungus / protozoan	
Test Species:	Beauveria bassiana	Cunninghamella elegans	Montierella isabellina
Life Stage:		protozoan → Tetrahymena pyriformis	
Duration:	14h TP	24h-ST	→ Spirostomum teres

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	
Test Concentrations (if appropriate):	
Test System (e.g., flow-thru, mesocosm, etc.):	

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	TP = 28°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( photoperiod ):	TP - dark	Other ( )::	
Other ( )::		Other ( )::	

n = 4 TP

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC (50)	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival TP		6.33			diuron mg/L
Growth	growth inhibition	2.28			metabolite 2
Reproduction		10.23			1 " 3
Embryo/Larval Develop. ST		40.2			diuron
	LC50	6.12			2
		10.18			3

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- analytical confirmation of parent &amp; metabolites</li> <li>- present data (tox) for microtox</li> <li>- other test w/ decreased fluorescence of via esterases</li> <li>- Stats discussed - ok</li> </ul>

reference method for ST

metabolite 2 N-(3,4-dichlorophenyl)-N'-methylurea  
 3 N-3,4-dichlorophenylurea

Reviewer/Date:	RZN 10/21/03
Title of Paper/Report:	Degradation products of a phenylurea herbicide, diuron: synthesis, ecotoxicity, and biotransformation
Author(s)	Tixier et al
Journal/Year/Vol:Pages	Environ Toxicol Chem 2001 20: 1381-1389

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with )	Indicate Yes or No
Human health effects	No
Effects to microorganisms	yes
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	Microtox

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	5
Mixtures of any of the five herbicides	Na
Indirect effects (food supply, cover)	Na

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	

- biotransformation via fungal cells  
 - tox data for using Microtox EC50s of degradation products

Reviewer/Date:	MBS 10/17/03
Title of Paper/Report:	The tolerance of grass carp <i>Ctenopharyngodon</i> Della Val. to aquatic herbicides
Author(s)	Tooby, Lucey & Stott
Journal/Year/Vol:Pages	J Fish Biol 1980 16:591-597

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	3
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degrades, metabolite effects	NA
Mixtures of any of the five herbicides	↓
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	yes n=?
Were proper controls used and was control performance acceptable?	NR
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	

- Minimal logs  
 - not sure about replication  
 - acetone conc higher than present data  
 quizes

low-mid rank

**Task 2: Data Evaluation**

Reviewer/Date:	RZW 10/17/03
Partial Title of Paper/Report:	The tolerance of grass carp, <i>Ctenopharyngodon...</i>

Herbicides tested:	diuron diquat
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	<del>Warmwater Fish</del>	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Grass & Carp	
Test Species:	<i>Ctenopharyngodon idella</i>		
Life Stage:	9.5 cm	15.8g	1+yr
Duration:	5d		

Exposure Conditions	
Formulation:	diuron technical grade (92%) <sup>Aquicide</sup> diquat <sup>control</sup> formulation 13.5%
Concentration/amount of active ingredient:	100%
Medium (water, food, soil, etc.):	Water
Test Concentrations (if appropriate):	geometric series
Test System (e.g., flow-thru, mesocosm, etc.):	40L glass aquaria flow-thru (10 L/h) 10 fish/aq

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	13°C - diuron	Organic Carbon (D or T):	
pH:	8.1	Ammonia:	
Other ( ):	dechlorinated tap H <sub>2</sub> O	Other ( ):	
Other ( hard ):	270 mg/L	Other ( ):	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival diquat	1718 (560-5275)				
Growth diuron	31 (28-34)				
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	<ul style="list-style-type: none"> <li>- 1 wk acclimation</li> <li>- fed during study</li> <li>- diuron - solvent control (acetone) - 1000 mg/L - highest conc.</li> <li>- also present at 4 &amp; 48h LC50s</li> <li>- reps?</li> </ul>

Reviewer/Date:	LRN 10/21/03
Title of Paper/Report:	Tissue residues of diazinon in channel catfish, <i>Ictalurus punctatus</i> exposed to the algicide in consecutive years
Author(s)	Tucker & Kingsbury
Journal/Year/Vol:Pages	J World Aquaculture Soc 2003 34: 203-209

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	↓
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	↓
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	Yes
Mixtures including non-BLM herbicides	No
Marine receptors	↓

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	NO
Additional comments regarding acceptance/rejection:	

- tissue residues of diazinon  
 - no carry over from one field yr to the next

Reviewer/Date:	WJN 10/22/03
Title of Paper/Report:	Haemotic effect of phenylurea herbicides in rats: role of haemoglobin- adduct formation in splenic toxicity
Author(s)	Wang et al
Journal/Year/Vol:Pages	Fd Chem Toxic. 1993 31 285-295

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with )	Indicate Yes or No
Human health effects	NO ↓ ↓ ↓ ↓ ↓ ↓ ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	1 ↓ NA ↓ ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	yes
Was the test of proper exposure dose, mechanism, & duration?	yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	- stats NO
Were proper controls used and was control performance acceptable?	yes
Are the data presented in a peer-reviewed journal?	yes

Should evaluation of this paper continue in Task 2?	yes
Additional comments regarding acceptance/rejection:	heavy wt. data - ignored haemotoxic effects

**Task 2: Data Evaluation**

Reviewer/Date:	RBN 10/22/03
Partial Title of Paper/Report:	Haematotoxic effect of phylarea herbicides...

Herbicides tested:	diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other: Female Sprague-Dawley rats	
Test Species:			
Life Stage:	120-150g		
Duration:	14 months		

Exposure Conditions	
Formulation:	
Concentration/amount of active ingredient:	
Medium (water, food, soil, etc.):	Food
Test Concentrations (if appropriate):	250-1000 mg/kg diet
Test System (e.g., flow-thru, mesocosm, etc.):	

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	23°C	Organic Carbon (D or T):	
pH:		Ammonia:	
Other (rel hum):	50%	Other ( )::	
Other (light/dark):	12h/12h	Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival					
✓ Growth			1000	1000	mg/kg
Reproduction					
Embryo/Larval Develop.					

Degradates/Inerts:	
Additional Comments and Observations:	- no analytical presented

Reviewer/Date:	R-JD 10/26/03
Title of Paper/Report:	Evaluation of the effect of chemicals on aquatic ecosystem by observing the photosynthetic activity of a macrophyte, <i>Parhyza yezoensis</i>
Author(s)	Yoshida et al
Journal/Year/Vol:Pages	Aquatic Toxicol 1986/9: 207-214

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓ Maybe ✓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rat hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	yes

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection:	testing of macrophyte that appears to be important species for aquaculture in Japan exclude - unlikely relevance to US

duration

exclude - unlikely relevance to US

Reviewer/Date:	10/26/03 RSD
Title of Paper/Report:	Short-term effect of divuron on catfish pond ecology
Author(s)	Zimber et al
Journal/Year/Vol:Pages	North American J Aquaculture 2002/64/16-23

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No ↓
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	NA ↓
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Not evaluated ↓
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection:	

- focus on reduction of cyanobacteria and off-flavor in catfish fillets resulting

Reviewer/Date:	Pillard / 5-10-02
Title of Paper/Report:	Acute toxicity of pesticides in adult and weanling rats
Author(s)	T. B. Gaines & R. E. Linden
Journal/Year/Vol:Pages	Fund. & Appl. Toxicol. / 1986 / 7:299-308

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Yes
Was the test of proper exposure dose, mechanism, & duration?	Yes
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	Yes (LD50)
Were proper controls used and was control performance acceptable?	could not determine
Are the data presented in a peer-reviewed journal?	Yes

Should evaluation of this paper continue in Task 2?	Yes
Additional comments regarding acceptance/rejection:	

Task 2: Data Evaluation

Reviewer/Date:	Pillant / 7-22-03
Partial Title of Paper/Report:	Acute toxicity of pesticides in adult...

Herbicides tested:	digquat bromacil diuron
--------------------	-------------------------

20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	(Other) Sherman - strain rat	
Test Species:	Rat		
Life Stage:	90 days (adult tests); 4-6 wks (weanlings)		

Exposure Conditions	
Formulation:	9,10-Dihydro-8a,10a-diazonia phenanthrene
Concentration/amount of active ingredient:	dibromide monohydrate
Medium (water, food, soil, etc.):	Water/oil CAS 638562-2
Test Concentrations (if appropriate):	Multiple doses used, but not presented
Test System (e.g., flow-thru, mesocosm, etc.):	Oral dosing or dermal dosing

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:		Organic Carbon (D or T):	
pH:		Ammonia:	
Other ( )::		Other ( )::	
Other ( )::		Other ( )::	

Endpoint	LD50 Biological and Statistical Endpoints				
	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival Oral	<del>27 (20-34) mg/kg</del>		147 (138-155 mg/kg)		
Growth Surv. Oral	121 (108-136 mg/kg)				
Reproduction Surv. Dermal	433 (344-568)				
Embryo/Larval Develop.					
diuron Adult ♂	1258		791		bromacil
Adult ♀	1182		641		
weanling ♂			1737		

Degradates/Inerts:	
Additional Comments and Observations:	Oral application as dissolved in water or peanut oil. Digquat in water was used for dermal application.

Adult ♂  
Adult ♀  
Adult ♂

new 10/8/03 P3N - see Table 2 p 304 for data on bromacil & diuron dermal for both ♂ + ♀ = 2500 mg/kg

Reviewer/Date:	Pillard / 5-17-03 <i>PLJN</i>
Title of Paper/Report:	Acute toxicity of 12 herbicides to the green algae - - -
Author(s)	J. Ma & W. Liang
Journal/Year/Vol:Pages	Bull Environ. Contam Toxicol / 2001 / 67:747-351

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	Yes (algae)
Genotoxic effects (mutagenic, carcinogenic)	No
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	3
Inerts, degradates, metabolite effects	1
Mixtures of any of the five herbicides	1
Indirect effects (food supply, cover)	1

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	Yes

Should evaluation of this paper continue in Task 2?	<del>Yes</del> <b>NO</b>
Additional comments regarding acceptance/rejection:	<i>apparent data on specific target herbicides !! Deals only w microorganisms - no</i>

Reviewer/Date:	Pillard / 5-17-03
Title of Paper/Report:	Manual of acute toxicity: interpretation and data base for 410 chemicals - - -
Author(s)	FL. Mayer, & M.R. Ellersieck
Journal/Year/Vol:Pages	US DOI, FWS / 1986 / Res. Publ. 160

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	NA
Was the test of proper exposure dose, mechanism, & duration?	
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	
Were proper controls used and was control performance acceptable?	
Are the data presented in a peer-reviewed journal?	No N.R. followed ASTM

Should evaluation of this paper continue in Task 2?	Yes
Additional comments regarding acceptance/rejection: Database pub - summarizes many studies	

**Task 2: Data Evaluation**

Reviewer/Date:	RAN 10/6/03
Partial Title of Paper/Report:	Manual of acute tox: interpretation and...

Herbicides tested:	diquat fluroxone diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	Aquatic Invertebrate	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Various		
Life Stage:	Various		
Duration:	48-96h		

Exposure Conditions	
Formulation:	diquat 35.2%
Concentration/amount of active ingredient:	fluroxone (98% tech + 41% liquid)
Medium (water, food, soil, etc.):	water
Test Concentrations (if appropriate):	NR
Test System (e.g., flow-thru, mesocosm, etc.):	static / static renewal / flow through

Test System Monitoring	
Dissolved Oxygen:	Various in app
Temperature:	
pH:	
Other ( )::	
Other ( )::	
Other ( )::	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	2800-7500 µg/L	Bluegill	Diuron		
Growth	115,000-498,000 µg/L	"	Diquat		
Reproduction					
Embryo/Larval Develop.			Diquat 18	LC50s	p 179
			fluroxone 24	"	p 245
			diuron 48	LC50s	p 182
			59		

Degradates/Inerts:	
Additional Comments and Observations:	also list 24 & 48h data for some studies

Reviewer/Date:	Pillard / 11-26-03
Title of Paper/Report:	Toxicities of some herbicides to six species of freshwater crustaceans
Author(s)	H. O. Sanders
Journal/Year/Vol:Pages	J. W. PCF. / 1970 / 42:1544-1550

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with)	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	1
Mixtures of any of the five herbicides	1
Indirect effects (food supply, cover)	1

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	No
Was the test of proper exposure dose, mechanism, & duration?	Unknown
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	No
Were proper controls used and was control performance acceptable?	Unknown
Are the data presented in a peer-reviewed journal?	Unknown

Should evaluation of this paper continue in Task 2?	No yes
Additional comments regarding acceptance/rejection:	No reps apparently used. diguata data not presented - in text

bioassay methods presented elsewhere (index 1 Copy 1968 + 1969)

**Task 2: Data Evaluation**

Reviewer/Date:	RZN 8/21/03
Partial Title of Paper/Report:	Toxicities of some herbicides to six species of freshwater crustaceans

Herbicides tested:	diquat diuron
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20 g Mammal	Honey Bee	70 kg Herbivore	Large Bird
Small Bird	<u>Aquatic Invertebrate</u>	Warmwater Fish	Coldwater Fish
Non-Target Plants	Aquatic Plant (Macrophyte)	Other:	
Test Species:	Gammarus fasciatus		
Life Stage:	early instar		
Duration:	≤ 96 h		

Exposure Conditions	
Formulation:	technical (Diuron) or emulsifiable concentrate (diquat)
Concentration/amount of active ingredient:	Diuron technical
Medium (water, food, soil, etc.):	dissolved in EtOH (< 1 ml/L of H <sub>2</sub> O)
Test Concentrations (if appropriate):	4-5 not specified (with appropriate controls)
Test System (e.g., flow-thru, mesocosm, etc.):	static 4 L of exposure H <sub>2</sub> O

Test System Monitoring			
Dissolved Oxygen:		Conductivity:	
Temperature:	15.5°C	Organic Carbon (D or T):	
pH:	7.4	Ammonia:	
Other ( TDS ):	361 mg/L	Other (hardness ):	272 mg/L Ca = 176 mg/L Mg = 96 mg/L
Other ( AIC ):	260 mg/L	Other ( ):	

Biological and Statistical Endpoints					
Endpoint	LC50/EC50	IC ( )	NOEC/NOAEC	LOEC	Other ( )
Mortality/Survival	1.8 (0.80-5.2) (96h)	Diuron mg/L			
Growth "	0.7 (0.17-9.2) (96h)				
Reproduction					
Embryo/Larval Develop.					
mortality	> 100 mg/L	for diquat			

Data on scud (diquat & diuron) from a # of bioassays → methods not clearly presented

Degradates/Inerts:	
Additional Comments and Observations:	<p>&lt; 10% mortality 4d prior to testing</p> <ul style="list-style-type: none"> <li>- n = 1 (?) with 10 organisms/chamber</li> <li>- 2h acclimation period in chamber prior to intro of herbicide</li> <li>- prelim tests used to set test concs</li> </ul>

Reviewer/Date:	Pillard / 6-3-03
Title of Paper/Report:	Toxicity of some herbicides to major carp fingerlings
Author(s)	S. P. Singh & N. K. Yadav.
Journal/Year/Vol:Pages	J. Ecol / 1978 / 5: 141-147

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with )	Indicate Yes or No
Human health effects	No
Effects to microorganisms	
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	1
Inerts, degradates, metabolite effects	1
Mixtures of any of the five herbicides	1
Indirect effects (food supply, cover)	1

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Yes
Was the test of proper exposure dose, mechanism, & duration?	No
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	No
Were proper controls used and was control performance acceptable?	No
Are the data presented in a peer-reviewed journal?	Yes

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection:	<p>Study did not apparently follow appropriate scientific procedures - methods mentioned elsewhere (user 1971)</p> <p>- presents results in figs as % mortality</p> <p>- don't calc endpts eg. LC50, NOEC, etc</p>

dequit  
duration

Reviewer/Date:	Pillard / 6-22-03
Title of Paper/Report:	Effects of selected herbicides on bacterial populations. . .
Author(s)	O. Yazar et al.
Journal/Year/Vol:Pages	Wat. Res. Bull / 1975 / 11: 294 - 299

**Task 1: Application of Selection Criteria**

**A. Indicate if the paper meets these exclusion criteria**

Issue (deals only with )	Indicate Yes or No
Human health effects	No
Effects to microorganisms	Yes
Genotoxic effects (mutagenic, carcinogenic)	
Bioassays to cells of a whole organism (e.g., rate hepatocytes, rat liver S9)	
Effects to target plants (efficacy testing)	
Nontoxic effects (e.g., fate, transport, leaching, analytical methods)	
Mixtures including non-BLM herbicides	
Marine receptors	

**B. Issues to be emphasized**

Issue	Rate Paper from 1 (Weak emphasis) to 5 (Strong)
Effects on nontarget receptors related to ERA protocol	
Chronic effects (e.g., reproductive) that may affect populations	
Inerts, degradates, metabolite effects	
Mixtures of any of the five herbicides	
Indirect effects (food supply, cover)	

**C. Other Criteria**

Issue	Indicate Yes or No
Are corroborating studies described?	Yes
Was the test of proper exposure dose, mechanism, & duration?	No
Did the test include proper sample size, statistical analysis (especially NOAEL, or dose response curve)?	No (No reps)
Were proper controls used and was control performance acceptable?	Yes
Are the data presented in a peer-reviewed journal?	Yes

Should evaluation of this paper continue in Task 2?	No
Additional comments regarding acceptance/rejection: Bacteria only; true reps apparently not used; no stats	



**APPENDIX A.3**

**SPREADSHEET OF TOXICITY DATA FOR DIURON TRV**

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (a) <sup>1</sup>	Units	Chemical Analysis Done/ Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	tadpole 12 d & 30 d post hatch <sup>13</sup>	Static renewal	Water	14 d	14 d	Survival	LC <sub>50</sub> (ave. of 2 tests)	15.2	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	tadpole 12 d & 30 d post hatch <sup>13</sup>	Static renewal	Water	14 d	10-21 d	Length	NOAEL <sup>13</sup>	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	tadpole 12 d & 30 d post hatch <sup>13</sup>	Static renewal	Water	14 d	10-21 d	Length	LOAEL <sup>13</sup>	21.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
<b>Technical grade</b>	<b>99.8%</b>	<b>amphibian</b>	<b>Frog</b>	<b><i>Rana catesbeiana</i></b>	<b>tadpole held 15 mo @ 12-17 C</b>	<b>Static renewal</b>	<b>Water</b>	<b>21 d</b>	<b>21 d</b>	<b>Survival</b>	<b>LC<sub>50</sub></b>	<b>12.7</b>	<b>NR</b>	<b>mg/L</b>	<b>Yes/Yes</b>				<b>Schuytena &amp; Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.</b>			<b>No</b>
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	tadpole held 15 mo @ 12-17 C	Static renewal	Water	21 d	21 d	Length, Wet Weight	NOAEL	29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	tadpole held 15 mo @ 12-17 C	Static renewal	Water	21 d	21 d	Length, Wet Weight	LOAEL	> 29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
<b>Technical grade</b>	<b>99.8%</b>	<b>amphibian</b>	<b>Frog</b>	<b><i>Rana catesbeiana</i></b>	<b>tadpole held 15 mo @ 12-17 C</b>	<b>Static renewal</b>	<b>Water</b>	<b>21 d</b>	<b>21 d</b>	<b>Dry Weight</b>	<b>NOAEL</b>	<b>7.6</b>	<b>NR</b>	<b>mg/L</b>	<b>Yes/Yes</b>				<b>Schuytena &amp; Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.</b>			<b>No</b>
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	tadpole held 15 mo @ 12-17 C	Static renewal	Water	21 d	21 d	Dry Weight	LOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	1 d post-hatch	Static renewal	Water	10 d	10 d	Survival	LC <sub>50</sub>	> 29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	1 d post-hatch	Static renewal	Water	10 d	10 d	Length, Wet Weight	NOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	1 d post-hatch	Static renewal	Water	10 d	10 d	Length, Wet Weight	LOAEL	29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
<b>Technical grade</b>	<b>99.8%</b>	<b>amphibian</b>	<b>Frog</b>	<b><i>Rana catesbeiana</i></b>	<b>1 d post-hatch</b>	<b>Static renewal</b>	<b>Water</b>	<b>10 d</b>	<b>10 d</b>	<b>Dry Weight</b>	<b>NOAEL</b>	<b>7.6</b>	<b>NR</b>	<b>mg/L</b>	<b>Yes/Yes</b>				<b>Schuytena &amp; Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.</b>			<b>No</b>
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	1 d post-hatch	Static renewal	Water	10 d	10 d	Dry Weight	LOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	29 d post-hatch	Static renewal	Water	14 d	14 d	Survival	LC <sub>50</sub>	> 29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	29 d post-hatch	Static renewal	Water	14 d	14 d	Wet Weight	NOAEL	21.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	29 d post-hatch	Static renewal	Water	14 d	14 d	Wet Weight	LOAEL	29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	29 d post-hatch	Static renewal	Water	14 d	14 d	Length, Dry Weight	NOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana catesbeiana</i>	29 d post-hatch	Static renewal	Water	14 d	14 d	Length, Dry Weight	LOAEL	21.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Rana aurora</i>	tadpole 14 d	Static renewal	Water	14 d	74 d <sup>14</sup>	Mortality	LC <sub>50</sub>	22.2	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
<b>Technical grade</b>	<b>99.8%</b>	<b>amphibian</b>	<b>Frog</b>	<b><i>Rana aurora</i></b>	<b>tadpole 14 d</b>	<b>Static renewal</b>	<b>Water</b>	<b>14 d</b>	<b>74 d<sup>14</sup></b>	<b>Wet Weight</b>	<b>NOAEL</b>	<b>7.6</b>	<b>NR</b>	<b>mg/L</b>	<b>Yes/Yes</b>				<b>Schuytena &amp; Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.</b>			<b>No</b>
Technical grade	99.8%	amphibian	Frog	<i>Rana aurora</i>	tadpole 14 d	Static renewal	Water	14 d	74 d <sup>14</sup>	Wet Weight	LOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Survival	LC <sub>50</sub>	> 29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Deformity	EC <sub>50</sub>	22.2	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Deformity	NOAEL	14.5	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Deformity	LOAEL	29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Length	NOAEL	29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
Technical grade	99.8%	amphibian	Frog	<i>Pseudacris regilla</i>	embryo 10 d, stage 12	Static renewal	Water	10 d (4 d post-hatch)	10 d	Length	LOAEL	> 29.1	NR	mg/L	Yes/Yes				Schuytena & Nebeker. 1998. Arch. Environ. Contam. Toxicol. 34: 370-376.			No
1-(3,4-dichlorophenyl) methylurea	highest purity available	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>	cells	Static	Water	72 hr	72 hr	Growth	EC <sub>50</sub>	0.058	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
1-(3,4-dichlorophenyl) urea	highest purity available	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>	cells	Static	Water	72 hr	72 hr	Growth	EC <sub>50</sub>	0.07	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
50% wettable powder		aquatic plant	Green algae	<i>Chlorella pyrenoidosa</i>	cells	Static	Water	96 hr	96 hr	Growth	EC <sub>50</sub>	0.0013	NR	mg/L	No/No				Ma et al. 2001. Bull. Environ. Contam. Toxicol. 66: 536-541.			No
50% wettable powder		aquatic plant	Green algae	<i>Chlorella pyrenoidosa</i>	cells	Static	Water	96 hr	96 hr	Growth	EC <sub>50</sub>	5.59E-08	NR	M	No/No				Ma et al. 2001. Bull. Environ. Contam. Toxicol. 66: 536-541.			No
50% wettable powder		aquatic plant	Green algae	<i>Scenedesmus obliquus</i>	cells	Static	Water	96 hr	96 hr	Growth	EC <sub>50</sub>	0.00409	NR	mg/L	No/No				Ma. 2002. Bull. Environ. Contam. Toxicol. 68: 275-281.			No
50% wettable powder		aquatic plant	Green algae	<i>Scenedesmus obliquus</i>	cells	Static	Water	96 hr	96 hr	Growth	EC <sub>50</sub>	1.75E-08	NR	M	No/No				Ma. 2002. Bull. Environ. Contam. Toxicol. 68: 275-281.			No
50% wettable powder		aquatic plant	Green algae	<i>Chlorella vulgaris</i>	cells	Static	Liquid	96 hr	96 hr	Growth	EC <sub>50</sub>	0.0043	NR	mg/L	No/No				Ma et al. 2002. Ecotox. Environ. Safety 51: 128-132.			No
50% wettable powder		aquatic plant	Green algae	<i>Chlorella vulgaris</i>	cells	Static	Liquid	96 hr	96 hr	Growth	EC <sub>50</sub>	1.84E-08	NR	mol/L	No/No				Ma et al. 2002. Ecotox. Environ. Safety 51: 128-132.			No
DCMU	99%	aquatic plant	Marine periphyton		0 d - 4 w	Microcosm	Water	4 w	4 w	Photosynthesis	EC <sub>50</sub>	10	NR	nm	Yes/No <sup>9</sup>				Molander et al. 1992. Arch. Environ. Contam. Toxicol. 22: 419-427.			No
Diuron	highest purity available	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>	cells	Static	Water	72 hr	72 hr	Growth	EC <sub>50</sub>	0.045	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
Diuron	highest purity available	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>	cells	Static	Water	72 hr	72 hr	Growth	LOEC	0.015	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
Diuron	96.8%	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>		96-hr Acute	Water	96 hr	96 hr		EC <sub>50</sub>	0.0024	NR	mg/L		EPA	MRID 42218401		1991. In USEPA 2003.	C. Rodriguez	1994	Yes
Diuron	96.8%	aquatic plant	Green algae	<i>Selenastrum capricornutum</i>		96-hr Acute	Water	96 hr	96 hr		NOEC	0.00044	NR	mg/L		EPA	MRID 42218401		1991. In USEPA 2003.	C. Rodriguez	1994	Yes
Diuron	95%	aquatic plant	Green algae	<i>Dunaliella tertiolecta</i>			Water	240 hr	240 hr		EC <sub>50</sub>	0.02	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Green algae	<i>Chlamydomonas sp.</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.037	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Green algae	<i>Chlorococcum sp.</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.010	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Green algae	<i>Chlorella sp.</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.019	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Green algae	<i>Neochloris sp.</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.028	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Green algae	<i>Platymonas sp.</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.017	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Freshwater diatom	<i>Thalassiosira fluviatilis</i>		Static	Water	72 hr	72 hr		EC <sub>50</sub>	0.095	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Monochrysis lutheri</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.018	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Isochrysis galbana</i>			Water	240 hr	240 hr		EC <sub>50</sub>	0.01	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Achnanthes brevipes</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.024	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes

Formulation	% purity/a.l.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron	95%	aquatic plant	Algae	<i>Navicula incerta</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.093	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Stauroneis amphoroides</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.031	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Amphora exigua</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.031	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Nitzschia closterium</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.05	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
Diuron	95%	aquatic plant	Algae	<i>Porphyridium cruentum</i>			Water	72 hr	72 hr		EC <sub>50</sub>	0.024	NR	mg/L		EPA	MRID 40228401		1986. In USEPA 2003.	F.L. Mayer	1986	Yes
diuron/DCMU		aquatic plant	Diatom		various	In situ	Sediment Pore Water	59 d	59 d (test on d 17, 27, 41)	Abundance	NOEC	0.000002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
diuron/DCMU		aquatic plant	Diatom		various	In situ	Sediment Pore Water	59 d	59 d (test on d 17, 27, 41)	Abundance	LOEC	0.0002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Halophila ovalis</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	NOEC <sup>5</sup>	1.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Cymodocea serrulata</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	NOEC <sup>5</sup>	1.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Zostera capricorni</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	NOEC <sup>5</sup>	1.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Halophila ovalis</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	LOEC <sup>5</sup>	10.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Cymodocea serrulata</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	LOEC <sup>5</sup>	10.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Technical grade	98%	aquatic plant	Tropical seagrass	<i>Zostera capricorni</i>	unknown	Static	Seawater	5 d	5 d (+ 5 d recovery)	Photosynthesis	LOEC <sup>5</sup>	10.0	NR	ug/L	Yes/Yes				Haynes et al. 2000. Marine Poll. Bull. 41: 7-12.			No <sup>6</sup>
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	10 h	10 h	Chlorophyll a	NOEC	10	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	10 h	10 h	Chlorophyll a	LOEC <sup>10</sup>	100	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	2 hr	10 hr	Max. or effective quantum yield	NOEC	0	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	2 hr	10 hr	Max. or effective quantum yield	LOEC <sup>10</sup>	10	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	10 h	10 h	Max. or effective quantum yield	NOEC	0	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	2 months post-sprig	Static	Water	10 h	10 h	Max. or effective quantum yield	LOEC <sup>10</sup>	10	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	unknown	Static mesocosm	Water	2 hr	10 hr	Maximum quantum yield	NOEC	0	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	unknown	Static mesocosm	Water	2 hr	10 hr	Maximum quantum yield	LOEC <sup>10</sup>	10	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	unknown	Static mesocosm	Water	10 h	10 h	Maximum quantum yield	NOEC	10	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Seagrass	<i>Zostera capricorni</i>	unknown	Static mesocosm	Water	10 h	10 h	Maximum quantum yield	LOEC <sup>10</sup>	100	NR	ug/L	No/No				Macinnis-Ng & Ralph. 2003. Aquatic Biology 76: 1-15.			No
Diuron		aquatic plant	Green algae	<i>Scenedesmus subspicatus</i>	cells	Static	Algae media	72 hr	72 hr	Growth	EC <sub>50</sub>	0.036	NR	mg/L	No/No				Schafer et al. 1994. Ecotox. Environ. Safety 27: 64-81.			No
Diuron		aquatic plant	Green algae	<i>Scenedesmus subspicatus</i>	cells	Static	Algae media	72 hr	72 hr	Growth	NOEC	0.010	NR	mg/L	No/No				Schafer et al. 1994. Ecotox. Environ. Safety 27: 64-81.			No
Diuron		aquatic plant	Green algae	<i>Scenedesmus subspicatus</i>	cells	Static	Algae media	24 hr	24 hr	Growth	NOEC	0.007	NR	mg/L	No/No				Schafer et al. 1994. Ecotox. Environ. Safety 27: 64-81.			No
Diuron		bird	Ring-necked pheasant	<i>Phasianus colchicus</i>	2-3 w	Diet	Food	5 d	5 d (+ 3 d recovery)	Survival	LC <sub>50</sub> <sup>7</sup>	> 5000	NR	ppm (in feed)	No/No	FWS	MRID 00022923	Wildlife No 152	Heath et al. 1972. Special Scientific Report. 152: 1-57.			Yes
Diuron		bird	Mallard duck	<i>Anas platyrhynchos</i>	2-3 w	Diet	Food	5 d	5 d (+ 3 d recovery)	Survival	LC <sub>50</sub>	1730	NR	ppm (in feed)	No/No	FWS	MRID 00022923	Wildlife No 152	Heath et al. 1972. Special Scientific Report. 152: 1-57.	Hill, E.F. et al	1982	Yes
Diuron		bird	Bobwhite quail	<i>Colinus virginianus</i>	2-3 w	Diet	Food	5 d	5 d (+ 3 d recovery)	Survival	LC <sub>50</sub>	1730	NR	ppm (in feed)	No/No	FWS	MRID 00022923	Wildlife No 152	Heath et al. 1972. Special Scientific Report. 152: 1-57.	Hill, E.F. et al	1982	Yes

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron		bird	Mallard duck	<i>Anas platyrhynchos</i>	10 d	Diet	Food	5 d	5 d (+ 3 d recovery)	Survival	LC <sub>50</sub>	> 5000	NR	ppm (in feed)	No/No	FWS	MRID 00022923	Wildlife No 152	Heath et al. 1972. Special Scientific Report. 152: 1-57.	Hill, E.F. et al	1982	Yes
Diuron		bird	Japanese quail	<i>Coturnix coturnix</i>	2-3 w	Diet	Food	5 d	5 d (+ 3 d recovery)	Survival	LC <sub>50</sub> <sup>14</sup>	> 5000	NR	ppm (in feed)	No/No	FWS	MRID 00022923	Wildlife No 152	Heath et al. 1972. Special Scientific Report. 152: 1-57.	Hill, E.F. et al	1982	Yes
Diuron	92.8%	bird	Bobwhite quail	<i>Colinus virginianus</i>	17 w	Acute	Avian Oral	21 d	21 d	Mortality	LD <sub>50</sub>	940	NR	mg/kg BW		Wildlife Interntl	MRID 50150170		1985. In USEPA 2003.	E. Zucker	1993	Yes
Diuron	95%	bird	Mallard duck	<i>Anas platyrhynchos</i>	3 months	Acute	Avian Oral	14 d	14 d	Mortality	LD <sub>50</sub>	> 2000	NR	mg/kg BW		FWS	MRID 00160000		1970. In USEPA 2003.	Hudson, R.H. et al	1982	Yes
Diuron	>95%	bird	Bobwhite quail	<i>Colinus virginianus</i>		Acute	Avian Dietary				LC <sub>50</sub>	NR	> 5000	ai ppm			MRID 00022923		In USEPA 2003.		1975	Yes
Diuron	>95%	bird	Mallard duck	<i>Anas platyrhynchos</i>		Acute	Avian Dietary				LC <sub>50</sub>	NR	1730	ai ppm			MRID 00022923			Hill, E.R.	1975	Yes
Diuron	92.8%	bird	Bobwhite quail	<i>Colinus virginianus</i>	17 w	acute	Oral	21 d	21 d	Mortality	NOEL	< 292	NR	mg/kg BW		Wildlife Interntl	MRID 50150170		1985. In USEPA 2003.	E. Zucker	1993	Yes
Diuron		fish	Bluegill sunfish	<i>Lepomis macrochirus</i>	1.1-1.3 g	Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub> <sup>11</sup>	NR	NR		Unknown/No			FWS Res. Pub 160	Mayer & Ellersieck. 1986.			No
Diuron	95%	fish	Rainbow trout	<i>Oncorhynchus mykiss</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	1.95	NR	mg/L		EPA	STODIU04		1976. In USEPA 2003.	A. Stavola	1982	Yes
Diuron	95%	fish	Bluegill sunfish	<i>Lepomis macrochirus</i>		96-hr Acute	Water	96 hr	96 hr	Survival	LC <sub>50</sub>	2.8	NR	mg/L		FWS	MRID 40098001		1986. In USEPA 2003.	Mayer & Ellersieck	1986	Yes
Diuron	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	early life	Chronic	Water	60 d	60 d		NOEC	0.0264	NR	mg/L		EPA	MRID 00141636		In USEPA 2003.	A. Stavola	1982	Yes
Diuron	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	early life	Chronic	Water	60 d	60 d		LOEC	0.0618	NR	mg/L		EPA	MRID 00141636		In USEPA 2003.	A. Stavola	1982	Yes
Diuron	95%	fish	Cutthroat trout	<i>Oncorhynchus clarki</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	0.71	NR	mg/L		FWS	MRID 40098001		1986. In USEPA 2003.	Mayer & Ellersieck	1986	Yes
Diuron	95%	fish	Striped mullet	<i>Mugil cephalus</i>		96-hr Acute	Water	96 hr			LC <sub>50</sub>	NR	6.3	mg ai/L			MRID 40228401			F.L. Mayer	1986	Yes
Diuron	80%	fish	Rainbow trout	<i>Oncorhynchus mykiss</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	16	NR	mg/L		FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1980	Yes
Diuron	28%	fish	Rainbow trout	<i>Oncorhynchus mykiss</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	23.8	NR	mg/L		EPA	STODIV02		1975. In USEPA 2003.	A. Stavola	1982	Yes
Diuron	80%	fish	Rainbow trout	<i>Oncorhynchus mykiss</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	19.6	NR	mg/L		Dupont	MRID 42046002		In USEPA 2003.	C. Rodriguez	192	Yes
Diuron	95%	fish	Cutthroat trout	<i>Oncorhynchus clarki</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	1.4	NR	mg/L		FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1982	Yes
Diuron	95%	fish	Lake trout	<i>Salvelinus namaycush</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	2.7	NR	mg/L		FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1982	Yes
Diuron	95%	fish	Lake trout	<i>Salvelinus namaycush</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	1.2	NR	mg/L		FWS	MRID 40098001		1986. In USEPA 2003.	Mayer & Ellersieck	1986	Yes
Diuron	95%	fish	Coho salmon	<i>Oncorhynchus kisutch</i>		96-hr Acute	Water	96 hr	96 hr	Mortality	LC <sub>50</sub>	< 2.4	NR	mg/L		FWS	MRID 40098001		1986. In USEPA 2003.	Mayer & Ellersieck	1986	Yes
Diuron		fish	Fathead minnow	<i>Pimephales promelas</i>		Chronic	Water				LC <sub>50</sub>	NR										
Diuron	28%	fish	Bluegill sunfish	<i>Lepomis macrochirus</i>	1.9 g	Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub>	84	NR	mg/L		EPA	STODIV01		1975. In USEPA 2003.	A. Stavola	1982	Yes
Diuron	95%	fish	Bluegill sunfish	<i>Lepomis macrochirus</i>		Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub>	3.2	NR	mg/L		EPA	STODIU03		1976. In USEPA 2003.	A. Stavola	1982	Yes
Diuron	80%	fish	Bluegill sunfish	<i>Lepomis macrochirus</i>		Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub>	> 300	NR	mg/L		DUP	MRID 42046001		1991. In USEPA 2003.	C. Rodrigues	1992	Yes
Karmex		fish	Bluegill sunfish	<i>Lepomis macrochirus</i>	0.6 - 1.5 g	Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub> (12.7°C)	NR	8.9	mg ai/L	No/No				Macek et al. 1969. Bull. Environ. Contam. Toxicol. 4: 174-183.			No
Karmex		fish	Bluegill sunfish	<i>Lepomis macrochirus</i>	0.6 - 1.5 g	Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub> (18.3°C)	NR	7.6	mg ai/L	No/No				Macek et al. 1969. Bull. Environ. Contam. Toxicol. 4: 174-183.			No
Karmex		fish	Bluegill sunfish	<i>Lepomis macrochirus</i>	0.6 - 1.5 g	Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub> (23.8°C)	NR	5.9	mg ai/L	No/No				Macek et al. 1969. Bull. Environ. Contam. Toxicol. 4: 174-183.			No
Technical grade	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	30 d	Flow-through	Water	96 hr	192 hr	Survival	LC <sub>50</sub>	NR	14.2	mg ai/L	Yes/Yes	EPA	MRID 00141636		Call et al. 1987. Arch. Environ. Contam. Toxicol. 16: 607-613. <sup>3</sup>	A. Stavola	1982	Yes
Technical grade	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	30 d	Flow through	Water	192 hr	192 hr	Survival	LC <sub>50</sub>	NR	7.7	mg ai/L	Yes/Yes				Call et al. 1987. Arch. Environ. Contam. Toxicol. 16: 607-613.			No
Technical grade	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	< 24 hr	Flow through	Water	64 d	64 d	Survival	NOEC	NR	33.4	ug ai/L	Yes/Yes				Call et al. 1987. Arch. Environ. Contam. Toxicol. 16: 607-613.			No
Technical grade	98.6%	fish	Fathead minnow	<i>Pimephales promelas</i>	< 24 hr	Flow through	Water	64 d	64 d	Survival	LOEC	NR	78	ug ai/L	Yes/Yes				Call et al. 1987. Arch. Environ. Contam. Toxicol. 16: 607-613.			No
Technical grade	100%	fish	Carp	<i>Ctenopharyngodon idella</i>	1+ y	Flow through	Water	96 hr	5 d	Survival	LC <sub>50</sub>	NR	31	mg ai/L	No/No				Tooby et al. 1980. J. Fish Biol. 16: 591-597.			No

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron		fish	Channel catfish	<i>Ictalurus punctatus</i>	1 y, 14 g/12 cm	Static	Water	48 hr	48 hr	Survival	LC <sub>50</sub> (<10% mort.)	> 10	NR	mg/L	No/No				McCorkle et al. 1977. Bull. Environ. Contam. Toxicol. 18: 267-270.			No
Diuron		fish	Channel catfish	<i>Ictalurus punctatus</i>	1 y, 14 g/12 cm	Static	Water	48 hr	48 hr	Survival	NOEC	10	NR	mg/L	No/No				McCorkle et al. 1977. Bull. Environ. Contam. Toxicol. 18: 267-270.			No
Diuron		fish	Channel catfish	<i>Ictalurus punctatus</i>	1 y, 14 g/12 cm	Static	Water	48 hr	48 hr	Survival	LOEC (<10% mort.)	> 10	NR	mg/L	No/No				McCorkle et al. 1977. Bull. Environ. Contam. Toxicol. 18: 267-270.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	eggs (2.5 d)	Static	Water	7 d	7 - 10 d	Survival	LC <sub>50</sub>	NR	11.7	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	juv. 1.5 m	Static	Water	10 d	7 - 10 d	Survival	LC <sub>50</sub>	NR	27.1	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	eggs (2.5 d)	Static	Water	7 d	7 - 10 d	Growth	NOAEC	NR	4.2	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	juv. 1.5 m	Static	Water	10 d	7 - 10 d	Growth	NOAEC	NR	< 3.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	eggs (2.5 d)	Static	Water	7 d	7 - 10 d	Growth	LOAEC	NR	8.3	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	fish	Fathead minnow	<i>Pimephales promelas</i>	juv. 1.5 m	Static	Water	10 d	7 - 10 d	Growth	LOAEC	NR	3.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - burst swimming	NOEC/NOAEC	5	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - sheltering	NOEC/NOAEC	50	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - surfacing	NOEC/NOAEC	50	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - burst swimming	NOEC/NOAEC	< 0.1	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - attraction	NOEC/NOAEC	1	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - surfacing	NOEC/NOAEC	10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - grouping	NOEC/NOAEC	10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - sheltering	NOEC/NOAEC	10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - burst swimming	LOEC	50	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - sheltering	LOEC	> 50	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Static	Water	24 hr	24 hr (10 min. observation)	Behavior - surfacing	LOEC	> 50	NR	ug/l	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - burst swimming	LOEC	0.1	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - attraction	LOEC	10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - surfacing	LOEC	> 10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - grouping	LOEC	> 10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
Diuron	99%	fish	Goldfish	<i>Carassius auratus</i>	6-8 cm (length), 6-9 g (wt)	Flow through	Water	10 min	10 min	Behavior - sheltering	LOEC	> 10	NR	mg/L	No/No <sup>12</sup>				Saglio & Trijasse. 1998. Arch. Environ. Contam. Toxicol. 35: 484-491.			No
<b>Technical grade</b>		<b>insect</b>	<b>Honey bee</b>	<b><i>Apis mellifera</i></b>	<b>Adult</b>	<b>Acute</b>	<b>Direct Application</b>	<b>48 hr</b>	<b>48 hr</b>	<b>Mortality</b>	<b>LD<sub>50</sub></b>	<b>145</b>	<b>NR</b>	<b>ug/bee</b>		<b>UCR</b>	<b>MRID 00036935</b>		<b>1975. In USEPA 2003.</b>	<b>A. Vaughan</b>	<b>1986</b>	<b>Yes</b>
Diuron	95%	insect	Stonefly	<i>Pteronarcys sp.</i>		96-hr Acute	Water	96 hr	96 hr		LC <sub>50</sub>	1.2	NR	ppm	Yes/Yes	FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1980	Yes
Diuron	99.8%	aquatic invertebrate	Midge	<i>Chironomus tentans</i>	2 d, 1st instar	Static	Water	10 d	7 - 10 d	Survival	LC <sub>50</sub>	NR	3.3	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Midge	<i>Chironomus tentans</i>	2 d, 1st instar	Static	Water	10 d	7 - 10 d	Survival	NOAEC	NR	3.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron	99.8%	aquatic invertebrate	Midge	<i>Chiromus tentans</i>	2 d, 1st instar	Static	Water	10 d	7 - 10 d	Survival	LOAEC	NR	7.1	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron		insect	Ladybug	<i>Coleomegilla maculata</i>		Field application	Plant	3 applications	3 applications		NOEC/NOAEC	2.53	NR	kg/ha	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Geocoris punctipes</i>		Field application	Plant	3 applications	3 applications		NOEC/NOAEC	2.53	NR	kg/ha	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Orius insidiosus</i>		Field application	Plant	3 applications	3 applications		NOEC/NOAEC	2.53	NR	kg/ha	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect	Ladybug	<i>Coleomegilla maculata</i>		Field application	Plant	3 applications	3 applications		LOEC	> 2.5	NR	?	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Geocoris punctipes</i>		Field application	Plant	3 applications	3 applications		LOEC	> 2.5	NR	?	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Orius insidiosus</i>		Field application	Plant	3 applications	3 applications		LOEC	> 2.5	NR	?	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect	Ladybug	<i>Coleomegilla maculata</i>		Lab	Vial or Dipping	48 hr	48 hr	Mortality	LC <sub>50</sub>	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Geocoris punctipes</i>		Lab	Vial or Dipping	48 hr	48 hr	Mortality	LC <sub>50</sub>	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Orius insidiosus</i>		Lab	Vial or Dipping	48 hr	48 hr	Mortality	LC <sub>50</sub>	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect	Ladybug	<i>Coleomegilla maculata</i>		Lab	Vial or Dipping	48 hr	48 hr		NOEC/NOAEC	10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Geocoris punctipes</i>		Lab	Vial or Dipping	48 hr	48 hr		NOEC/NOAEC	10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Orius insidiosus</i>		Lab	Vial or Dipping	48 hr	48 hr		NOEC/NOAEC	10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect	Ladybug	<i>Coleomegilla maculata</i>		Lab	Vial or Dipping	48 hr	48 hr		LOEC	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Geocoris punctipes</i>		Lab	Vial or Dipping	48 hr	48 hr		LOEC	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
Diuron		insect		<i>Orius insidiosus</i>		Lab	Vial or Dipping	48 hr	48 hr		LOEC	> 10	NR	%	No/No				Stam et al. 1978. J. Econom. Entom. 71: 477-480.			No
1-(3,4-dichlorophenyl) methylurea	highest purity available	aquatic invertebrate	Water flea	<i>Daphnia magna</i>	< 24 hr	Static	Water	48 hr	48 hr	Immobilization	EC <sub>50</sub>	0.04	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
1-(3,4-dichlorophenyl) urea	highest purity available	aquatic invertebrate	Water flea	<i>Daphnia magna</i>	< 24 hr	Static	Water	48 hr	48 hr	Immobilization	EC <sub>50</sub>	14.9	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
3,(3,4-dichlorophenyl)-1,1-dimethylurea <sup>8</sup>		aquatic invertebrate	Sea urchin	<i>Hemicentrotus pulcherrimus</i>	eggs and sperm	Static	Seawater	32 hr or 48 hr	32 hr or 48 hr	Development	NOEC	1	NR	mg/L	No/No				Kobayashi & Okamura. 2002. Marine Poll. Bull. 44: 748-751.			No <sup>6</sup>
3,(3,4-dichlorophenyl)-1,1-dimethylurea <sup>8</sup>		aquatic invertebrate	Sea urchin	<i>Anthocidaris crassispinata</i>	eggs and sperm	Static	Seawater	32 hr or 48 hr	32 hr or 48 hr	Development	NOEC	1	NR	mg/L	No/No				Kobayashi & Okamura. 2002. Marine Poll. Bull. 44: 748-751.			No <sup>6</sup>
Diuron		aquatic invertebrate	Snail	<i>Lymnea sp.</i>		Static	Water	96 hr	96 hr	Survival	LC <sub>50</sub>	NR	15.3	mg ai/L	No/No				Christian & Tate. 1983. Bull. Environ. Toxicol. Chem. 30: 628-631.			No
Diuron		aquatic invertebrate	Water flea	<i>Ceriodaphnia dubia</i>	<24 hr	Static	Water	48 hr	48 hr	Immobilization	EC <sub>50</sub> <sup>4</sup>	1.0	NR	mg/L	Yes/No				Foster et al.1998. Australasian J. Ecotoxicol. 4:53-59.			No
Diuron		aquatic invertebrate	Water flea	<i>Ceriodaphnia dubia</i>	<24 hr	Static	Water	48 hr	48 hr	Immobilization	EC <sub>50</sub> <sup>4</sup>	1.7	NR	mg/L	Yes/No				Foster et al.1998. Australasian J. Ecotoxicol. 4:53-59.			No
Diuron	highest purity available	aquatic invertebrate	Water flea	<i>Daphnia magna</i>	< 24 hr	Static	Water	48 hr	48 hr	Immobilization	EC <sub>50</sub>	8.6	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
Diuron	highest purity available	aquatic invertebrate	Water flea	<i>Daphnia magna</i>	< 24 hr	Static	Water	48 hr	48 hr	Immobilization	LOEC	3.5	NR	mg/L	No/No				Fernandez-Alba et al. 2002. Analytica Chimica Acta. 456: 303-312.			No
<b>Diuron</b>	<b>95%</b>	<b>aquatic invertebrate</b>	<b>Scud</b>	<b><i>Gammarus fasciatus</i></b>		<b>48-hr Acute</b>	<b>Water</b>	<b>48 hr</b>			<b>EC<sub>50</sub></b>	<b>0.16</b>	<b>NR</b>	<b>mg/L</b>	<b>Yes/Yes</b>	<b>FWS</b>	<b>MRID 40094602</b>		<b>1980. In USEPA 2003.</b>	<b>Johnson &amp; Finley</b>	<b>1980</b>	<b>Yes</b>
Diuron	95%	aquatic invertebrate	Water flea	<i>Daphnia pulex</i>	1st-I	48-hr Acute	Water	48 hr	48 hr		EC <sub>50</sub>	1.4	NR	mg/L	Yes/Yes	FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1980	Yes
Diuron	80%	aquatic invertebrate	Water flea	<i>Daphnia magna</i>		48-hr Acute	Water	48 hr	48 hr		EC <sub>50</sub>	8.4	NR	mg/L	Yes/Yes	DUP	MRID 42046003		1991. In USEPA 2003.	C. Rodriquez	1992	Yes

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron	98%	aquatic invertebrate	Water flea	<i>Daphnia magna</i>	early life	Chronic	Water	28 d	28 d		LOEC	0.2	NR	mg/L	Yes/Yes	EPA	STODIU05		1979. In USEPA 2003.	A. Stavola	1982	Yes
Diuron	95%	aquatic invertebrate	Water flea	<i>Simocephalus sp.</i>	1st-l	48-hr Acute	Water	48 hr	48 hr		EC <sub>50</sub>	2	NR	mg/L	Yes/Yes	FWS	MRID 40094602		1980. In USEPA 2003.	Johnson & Finley	1980	Yes
diuron/DCMU		aquatic invertebrate	Oligochaete	<i>Amphichaeta leydigii</i>	unknown	In situ	Sediment Pore Water	59 d	59 d (test on d 11, 17, 27, 31, 59)	Abundance	NOEC	0.00002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
diuron/DCMU		aquatic invertebrate	Oligochaete	<i>Amphichaeta leydigii</i>	unknown	In situ	Sediment Pore Water	59 d	59 d (test on d 11, 17, 27, 31, 59)	Abundance	LOEC	0.0002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
Karmex DF	240 g/100 L	aquatic invertebrate	Spider mite	<i>Neoseiulus fallacis (Garman)</i>	adult	Slide dip bioassay	Liquid	48 hr	48 hr	Survival	NOEC	NR	13.1	mg ai/L	No/No				Metzger & Pfeiffer. 2002. J. Entomol. Sci. 37: 329-337.			No
Technical grade	corrected to 100% a.i.	invertebrate	Earthworm	<i>Eisenia foetida</i>	adult 370-450 mg	Dermal	Filter paper	48 hr	48 hr	Survival	LC <sub>50</sub>	NR	> 1000	ug ai/cm <sup>3</sup>	No/No				Roberts & Dorough. 1984. Environ. Toxicol. Chem. 3: 67-78.			No
Technical grade		aquatic invertebrate	Scud	<i>Gammarus fasciatus</i>	early instar	Static	Water	96 hr	96 hr	Survival	TL <sub>50</sub>	0.7	NR	mg/L	No/No				Sanders. 1970. Water Pollut. Control Feder. 42: 1544-1550.			No
Diuron	99.8%	aquatic invertebrate	Water flea	<i>Daphnia pulex</i>	5 d	Static	Water	96 hr	7 - 10 d	Survival	LC <sub>50</sub>	NR	17.9	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Water flea	<i>Daphnia pulex</i>	5 d	Static	Water	7 d	7 - 10 d	Survival	LC <sub>50</sub>	NR	7.1	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Amphipod	<i>Hyalella azteca</i>	2 - 3 d	Static	Water	96 hr	7 - 10 d	Survival	LC <sub>50</sub>	NR	19.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Amphipod	<i>Hyalella azteca</i>	2 - 3 d	Static	Water	10 d	7 - 10 d	Survival	LC <sub>50</sub>	NR	18.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Annelid worm	<i>Lumbriculus variegatus</i>	adult	Static	Water	10 d	7 - 10 d	Growth	NOAEC	NR	1.8	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Snail	<i>Physa gyrina</i>	15 d	Static	Water	10 d	7 - 10 d	Growth	NOAEC	NR	13.4	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Water flea	<i>Daphnia pulex</i>	5 d	Static	Water	7 d	7 - 10 d	Survival & Reproduction	NOAEC	NR	4.0	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Amphipod	<i>Hyalella azteca</i>	2 - 3 d	Static	Water	10 d	7 - 10 d	Survival	NOAEC	NR	0.9	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Annelid worm	<i>Lumbriculus variegatus</i>	adult	Static	Water	10 d	7 - 10 d	Growth	LOAEC	NR	3.5	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Snail	<i>Physa gyrina</i>	15 d	Static	Water	10 d	7 - 10 d	Growth	LOAEC	NR	22.8	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Water flea	<i>Daphnia pulex</i>	5 d	Static	Water	7 d	7 - 10 d	Survival & Reproduction	LOAEC	NR	7.0	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	99.8%	aquatic invertebrate	Amphipod	<i>Hyalella azteca</i>	2 - 3 d	Static	Water	10 d	7 - 10 d	Survival	LOAEC	NR	15.0	mg ai/L	Yes/Yes				Nebeker & Schuytema. 1998. Arch. Environ. Contam. Toxicol. 35:L 441-446.			No
Diuron	>98%	aquatic plant	Duckweed	<i>Lemna minor</i>	unknown	Semi-static (renew day 4)	Water/Media	7 d	7 d	Growth	IC <sub>50</sub>	NR	25	ug ai/L	No/No <sup>15</sup>				Teisseire et al. 1999. Environ. Poll. 106: 39-45.			No
Diuron	>98%	aquatic plant	Duckweed	<i>Lemna minor</i>	unknown	Semi-static (renew day 4)	Water/Media	7 d	7 d	Growth	IC <sub>90</sub>	NR	60	ug ai/L	No/No <sup>15</sup>				Teisseire et al. 1999. Environ. Poll. 106: 39-45.			No
Diuron	>98%	aquatic plant	Duckweed	<i>Lemna minor</i>	unknown	Semi-static (renew day 4)	Water/Media	7 d	7 d	Growth	LOEC	NR	5	ug ai/L	No/No <sup>15</sup>				Teisseire et al. 1999. Environ. Poll. 106: 39-45.			No
Diuron		mammal	Rat	<i>Lab strain</i>		Chronic	Rat Oral			offspring body weight	NOEC	NR	250	ai ppm								Yes
Diuron		mammal	Rat	<i>Lab strain</i>		Chronic	Rat Oral			offspring body weight	LOEC	NR	1750	ai ppm								Yes
Diuron		mammal	Rat			Acute	Water				LC <sub>50</sub>	NR	5000 (m), 10000 (f)	mg ai/kg BW				EPA Ecological Risk Assessment (no date)				Yes

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/ Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron		mammal	Rat			Teratogenesis	Oral	gestation days 6 to 15		birth defects	NOEL	NR	125	mg ai/kg BW					PIP, 1996			No
Diuron		mammal	Rat			Teratogenesis	Oral	gestation days 6 to 15		birth defects	LOEL	NR	250	mg ai/kg BW					PIP, 1996			No
Diuron		mammal	Mouse			Teratogenesis	Oral			birth defects	LOEL	NR	2000	mg ai/kg BW					PIP, 1996			No
<b>Diuron</b>		<b>mammal</b>	<b>Rat</b>			<b>Acute</b>	<b>Oral</b>			<b>Mortality</b>	<b>LD<sub>50</sub></b>	<b>NR</b>	<b>1017</b>	<b>mg ai/kg BW</b>					<b>PIP, 1996</b>			<b>No</b>
Diuron		mammal	Rat			Acute	Oral			Mortality	LD <sub>50</sub>	NR	3750	mg ai/kg BW					PIP, 1996			No
Diuron		mammal	Rabbit			Acute dermal	Dermal			Mortality	LD <sub>50</sub>	NR	> 2000	mg ai/kg BW					PIP, 1996			No
Diuron		mammal	Rat			Acute	Oral			Mortality	LD <sub>50</sub>	NR	3400	mg ai/kg BW					PIP, 1996			No
Diuron		mammal	Rat			Chronic diet	Diet		2 y	Systemic	LOEL	NR	125 (6.25)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00080899		IRIS, 2003			No
Diuron		mammal	Rat			Chronic diet	Diet		2 y	Systemic	NOEL	NR	25 (1.25)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00080899		IRIS, 2003			No
Diuron		mammal	Rat			Chronic diet	Diet		3-gen	Systemic	LOEL	NR	125 (6.25)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00080899		IRIS, 2003			No
Diuron		mammal	Rat			Chronic diet	Diet		3-gen	Reproduction	NOEL	NR	25 (1.25)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00080899		IRIS, 2003			No
Diuron		mammal	Rat			Chronic diet	Diet			Fetal toxicity	LOEL	NR	125	mg ai/kg/d					Khera et al. 1979. Bull. Environ. Contam. Toxicol. 22: 522-529.			No
Diuron		mammal	Rat			Chronic diet	Diet			Teratogenesis	NOEL	NR	> 500	mg ai/kg/d					Khera et al. 1979. Bull. Environ. Contam. Toxicol. 22: 522-529.			No
<b>Diuron</b>		<b>mammal</b>	<b>Rat</b>			<b>Chronic diet</b>	<b>Diet</b>		<b>3 m</b>	<b>Systemic</b>	<b>NOEL</b>	<b>NR</b>	<b>50 (2.5)</b>	<b>ppm (mg ai/kg/d)</b>		<b>DuPont</b>	<b>MRID 00068036</b>		<b>IRIS, 2003</b>			<b>No</b>
Diuron		mammal	Rat			Chronic diet	Diet		3 m	Systemic	LOEL	NR	500 (25)	ppm (mg ai/kg/d)		DuPont	MRID 00068036		IRIS, 2003			No
Diuron		mammal	Dog			Chronic diet	Diet		2 y	Systemic	NOEL	NR	25 (0.625)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00091192		IRIS, 2003			No
Diuron		mammal	Dog			Chronic diet	Diet		2 y	Systemic	LOEL	NR	125 (3.125)	ppm (mg ai/kg/d)		DuPont	MRID 00017763 & 00091192		IRIS, 2003			No
Technical grade		mammal	Rat	Sherman strain rat	adult male	Oral	Organism	Single dose	at least 14 d	mortality	LD <sub>50</sub>	NR	1258	mg ai/kg	No/No				Gaines & Linder.1986. Fund. Appl. Toxicol. 7: 299-308.			Yes
Technical grade		mammal	Rat	Sherman strain rat	adult female	Oral	Organism	Single dose	at least 14 d	mortality	LD <sub>50</sub>	NR	1182	mg ai/kg	No/No				Gaines & Linder.1986. Fund. Appl. Toxicol. 7: 299-308.			Yes
<b>Technical grade</b>		<b>mammal</b>	<b>Rat</b>	<b>Sherman strain rat</b>	<b>adult male</b>	<b>Dermal</b>	<b>Organism</b>	<b>Single dose</b>	<b>at least 14 d</b>	<b>mortality</b>	<b>LD<sub>50</sub></b>	<b>NR</b>	<b>&gt; 2500</b>	<b>mg ai/kg</b>	<b>No/No</b>				<b>Gaines &amp; Linder.1986. Fund. Appl. Toxicol. 7: 299-308.</b>			<b>Yes</b>
<b>Technical grade</b>		<b>mammal</b>	<b>Rat</b>	<b>Sherman strain rat</b>	<b>adult female</b>	<b>Dermal</b>	<b>Organism</b>	<b>Single dose</b>	<b>at least 14 d</b>	<b>mortality</b>	<b>LD<sub>50</sub></b>	<b>NR</b>	<b>&gt; 2500</b>	<b>mg ai/kg</b>	<b>No/No</b>				<b>Gaines &amp; Linder.1986. Fund. Appl. Toxicol. 7: 299-308.</b>			<b>Yes</b>
diuron (Sigma Chemical)		mammal	Rat		120-150 g female	Oral	Food	14 m	14 m	Body Weight	NOEC	1000	NR	mg/kg diet	No/No				Wang et al. 1993. Food & Chem. Toxicol. 31: 285-295.			No
Diuron		terrestrial plant	Onion	<i>Allium cepa</i>						Seed emergence	EC <sub>50</sub>	NR	0.099	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Onion	<i>Allium cepa</i>						Seed emergence	EC <sub>05</sub>	NR	0.089	lb ai/acre					USEPA, 1995			Yes
<b>Diuron</b>		<b>terrestrial plant</b>	<b>Tomato</b>	<b><i>Lycopersicon esculentum</i></b>						<b>Seed emergence</b>	<b>EC<sub>50</sub></b>	<b>NR</b>	<b>0.080</b>	<b>lb ai/acre</b>					<b>USEPA, 1995</b>			<b>Yes</b>
Diuron		terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>						Seed emergence	EC <sub>05</sub>	NR	0.047	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Wheat	<i>Triticum aestivum</i>						Vigor	EC <sub>50</sub>	NR	0.021	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Wheat	<i>Triticum aestivum</i>						Vigor	EC <sub>05</sub>	NR	0.002	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>						Vigor	EC <sub>50</sub>	NR	0.002	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>						Vigor	EC <sub>05</sub>	NR	0.001	lb ai/acre					USEPA, 1995			Yes

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/ Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron		terrestrial plant	Corn	<i>Zea mays</i>						Shoot weight	EC <sub>50</sub>	NR	0.390	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Corn	<i>Zea mays</i>						Shoot weight	EC <sub>05</sub>	NR	0.190	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Onion	<i>Allium cepa</i>						Shoot weight	EC <sub>50</sub>	NR	0.148	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Onion	<i>Allium cepa</i>						Shoot weight	EC <sub>05</sub>	NR	0.094	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Sorghum	<i>Sorghum bicolor</i>						Shoot weight	EC <sub>50</sub>	NR	0.075	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Sorghum	<i>Sorghum bicolor</i>						Shoot weight	EC <sub>05</sub>	NR	0.012	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Wheat	<i>Triticum aestivum</i>						Shoot weight	EC <sub>50</sub>	NR	0.021	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Wheat	<i>Triticum aestivum</i>						Shoot weight	EC <sub>05</sub>	NR	0.002	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Pea	<i>Pisum sativum</i>						Shoot weight	EC <sub>50</sub>	NR	0.014	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Pea	<i>Pisum sativum</i>						Shoot weight	EC <sub>05</sub>	NR	0.003	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Soybean	<i>Glycine max</i>						Shoot weight	EC <sub>50</sub>	NR	0.012	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Soybean	<i>Glycine max</i>						Shoot weight	EC <sub>05</sub>	NR	0.002	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Rape	<i>Brassica sp.</i>						Shoot weight	EC <sub>50</sub>	NR	0.033	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Rape	<i>Brassica sp.</i>						Shoot weight	EC <sub>05</sub>	NR	0.012	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Cucumber	<i>Cucumis sativus</i>						Shoot weight	EC <sub>50</sub>	NR	0.005	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Cucumber	<i>Cucumis sativus</i>						Shoot weight	EC <sub>05</sub>	NR	0.005	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Sugar beet	<i>Beta vulgaris</i>						Shoot weight	EC <sub>50</sub>	NR	0.009	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Sugar beet	<i>Beta vulgaris</i>						Shoot weight	EC <sub>05</sub>	NR	0.005	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>						Shoot weight	EC <sub>50</sub>	NR	0.002	lb ai/acre					USEPA, 1995			Yes
Diuron		terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>						Shoot weight	EC <sub>05</sub>	NR	0.001	lb ai/acre					USEPA, 1995			Yes
Diuron	97.3%	terrestrial plant	Onion	<i>Allium cepa</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.09	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.08	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Rape	<i>Brassica sp.</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.09	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sugar beet	<i>Beta vulgaris</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.09	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Wheat	<i>Triticum aestivum</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	1.05	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Cucumber	<i>Cucumis sativus</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.34	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Garden pea	<i>Pisum sativum</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	> 12	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Soybean	<i>Glycine max</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	> 12	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Corn	<i>Zea mays</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	5.7	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sorghum	<i>Sorghum bicolor</i>				14 d		Seed emergence	EC <sub>25</sub>	NR	0.81	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Wheat	<i>Triticum aestivum</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.02	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Tomato	<i>Lycopersicon esculentum</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.00	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Garden pea	<i>Pisum sativum</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.01	lb ai/acre	DuPont	MRID 44113401			1996. In USEPA 2003.	GAI	1997	Yes

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
Diuron	97.3%	terrestrial plant	Rape	<i>Brassica sp.</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.03	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Onion	<i>Allium cepa</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.15	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sorghum	<i>Sorghum bicolor</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.08	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Cucumber	<i>Cucumis sativus</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.01	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Soybean	<i>Glycine max</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.01	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sugar beet	<i>Beta vulgaris</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.01	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Corn	<i>Zea mays</i>				21 d		Vigor	EC <sub>25</sub>	NR	0.39	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Onion</b>	<b><i>Allium cepa</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>0.047</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Tomato</b>	<b><i>Lycopersicon esculentum</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>0.047</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Rape</b>	<b><i>Brassica sp.</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>0.047</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Sugar beet</b>	<b><i>Beta vulgaris</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>0.047</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
Diuron	97.3%	terrestrial plant	Wheat	<i>Triticum aestivum</i>				14 d		Seed emergence	NOEL	NR	0.38	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Cucumber	<i>Cucumis sativus</i>				14 d		Seed emergence	NOEL	NR	0.19	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Garden pea</b>	<b><i>Pisum sativum</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>12</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Soybean</b>	<b><i>Glycine max</i></b>				<b>14 d</b>		<b>Seed emergence</b>	<b>NOEL</b>	<b>NR</b>	<b>12</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
Diuron	97.3%	terrestrial plant	Corn	<i>Zea mays</i>				14 d		Seed emergence	NOEL	NR	0.75	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sorghum	<i>Sorghum bicolor</i>				14 d		Seed emergence	NOEL	NR	0.75	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Wheat	<i>Triticum aestivum</i>				21 d		Vigor	NOEL	NR	0.0017	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
<b>Diuron</b>	<b>97.3%</b>	<b>terrestrial plant</b>	<b>Tomato</b>	<b><i>Lycopersicon esculentum</i></b>				<b>21 d</b>		<b>Vigor</b>	<b>NOEL</b>	<b>NR</b>	<b>0.001</b>	<b>lb ai/acre</b>		<b>DuPont</b>	<b>MRID 44113401</b>		<b>1996. In USEPA 2003.</b>	<b>GAI</b>	<b>1997</b>	<b>Yes</b>
Diuron	97.3%	terrestrial plant	Garden pea	<i>Pisum sativum</i>				21 d		Vigor	NOEL	NR	0.0029	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Rape	<i>Brassica sp.</i>				21 d		Vigor	NOEL	NR	0.0117	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Onion	<i>Allium cepa</i>				21 d		Vigor	NOEL	NR	0.094	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sorghum	<i>Sorghum bicolor</i>				21 d		Vigor	NOEL	NR	0.0117	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Cucumber	<i>Cucumis sativus</i>				21 d		Vigor	NOEL	NR	0.005	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Soybean	<i>Glycine max</i>				21 d		Vigor	NOEL	NR	0.002	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Sugar beet	<i>Beta vulgaris</i>				21 d		Vigor	NOEL	NR	0.005	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
Diuron	97.3%	terrestrial plant	Corn	<i>Zea mays</i>				21 d		Vigor	NOEL	NR	0.19	lb ai/acre		DuPont	MRID 44113401		1996. In USEPA 2003.	GAI	1997	Yes
diuron/DCMU		aquatic invertebrate	polychaete	<i>Hobsonia florida</i>	small juvenile (3-6 setigers)	In situ	Sediment Pore Water	59 d	59 d	Abundance	LOEC	>	0.0002	NR	M	No/No			Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
diuron/DCMU		aquatic invertebrate	polychaete	<i>Hobsonia florida</i>	large juvenile (7-28 setigers)	In situ	Sediment Pore Water	59 d	59 d (test d 4, 31, 41)	Abundance	NOEC	0.000002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No
diuron/DCMU		aquatic invertebrate	polychaete	<i>Hobsonia florida</i>	large juvenile (7-28 setigers)	In situ	Sediment Pore Water	59 d	59 d (test d 4, 31, 41)	Abundance	LOEC	0.0002	NR	M	No/No				Hentschel & Jumars. 1994. Limnol. Oceanogr.			No

Formulation	% purity/a.i.	General Taxonomic Group	Common Name	Scientific Name	Age	Test Type	Means of Exposure	Exposure Duration	Test Duration	Biological Endpoint	Statistical Endpoint	Toxicity Value (tested product) <sup>1</sup>	Toxicity Value (ai) <sup>1</sup>	Units	Chemical Analysis Done/Reported	Lab	Study Number	Report Number	Data Source <sup>2</sup>	EPA Reviewer	Date Reviewed	Used for TRV derivation
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Boldface indicates study selected for derivation of toxicity reference value (TRV) used in risk assessment.

<sup>1</sup>Toxicity values relate the dose of a compound with a potentially adverse effect. Values are reported as they were presented in the reviewed source.

<sup>2</sup>See the bibliography of this ERA document, Appendix A of the associated Literature Review document, and source footnote for complete citations.

<sup>3</sup>As cited in USEPA 2003.

<sup>4</sup>Based on measured concentrations.

<sup>5</sup>Measured final concentrations (D5) were 0.9 and 1.0 ug/l in two replicates.

<sup>6</sup>Marine species, not used for TRV derivation.

<sup>7</sup>33% mortality at 4200, repellent at 5000.

<sup>8</sup>Stock prepared in DMSO (dimethyl sulfoxide).

<sup>9</sup>Analysis during earlier experiments found concentrations between 65 and 100% of nominal.

<sup>10</sup>At least 100 ug/L after 96 h post-exposure.

<sup>11</sup>96-h LC<sub>50</sub>s range from 2.8 to 9.5 mg/L for 7 to 29°C.

<sup>12</sup>No analytical except for culture/holding water (diuron undetected).

<sup>13</sup>Same developmental stage due to holding temperature of older tadpoles.

<sup>14</sup>Test included 60 days post exposure in clean water.

<sup>15</sup>Nominal concentrations between 5 and 100 ug/L of a.i.

**Abbreviations**

m - male  
f - female  
a.i. - active ingredient

*Durations*

hr - hours  
d - days  
w - weeks  
m - months  
y - years

*Endpoints*

EC<sub>05</sub> - 5% effect concentration  
EC<sub>25</sub> - 25% effect concentration  
EC<sub>50</sub> - 50% effect concentration  
IC<sub>50</sub> - concentration causing 25% inhibition of a process  
IC<sub>90</sub> - concentration causing 90% inhibition of a process  
LC<sub>50</sub> - median lethal concentration, 50% mortality  
LD<sub>50</sub> - median lethal dose, 50% mortality  
TL<sub>50</sub> - median tolerance limit  
LOAEC - lowest-observable-adverse-effect concentration  
LOAEL - lowest-observable-adverse-effect level  
LOEC - lowest-observable-effect concentration  
LOEL - lowest-observable-effect level  
NOAEC - no-observable-adverse-effect concentration  
NOAEL - no-observable-adverse-effect level  
NOEC - no-observable-effect concentration  
NOEL - no-observable-effect level