2/28/92 EEB FILE 128701

D168830
DPBARCODE (RECORD)
128701
SHAUGHNESSY NO

REVIEW NO.

EEB REVIEW

DATE IN: 9-19-91 OUT:
ASSIGNED: 9-25-91
CASE # : 192865
SUBMISSION # : S402725
ID # : 8340-GL

DATE OF SUBMISSION 9-6-91

DATE RECEIVED BY EFED 9-18-91

SRRD/RD REQUESTED COMPLETION DATE 11-1-91

EEB ESTIMATED COMPLETION DATE 11-1-91

SRRD/RD **ACTION** CODE/TYPE OF REVIEW 161 RESB NEW PROD-"ME TOO"

| | | | |
|---|---|---|---|
| MRID #(S) 420096-03 | BLUEGILL ACUTE | (046360) | CORE |
| 420096-04 | RAINBOW TROUT ACUTE | (046360) | CORE |
| 420096-05 | RAINBOW TROUT ACUTE | (046360) | SUPPL. |
| 420096-06 | DAPHNIA MAGNA ACUTE | (046360) | INVALID |
| 420096-07 | MYSID SHRIMP ACUTE | (046360) | CORE |
| 420096-08 | MYSID SHRIMP ACUTE | (046360) | CORE |
| 420096-09 | ALGAE TEST, 123-2 | (046360) | SUPPL. |
| 420096-10 | ALGAE TEST, 123-2 | (033171) | CORE. |

**DP TYPE** 001 SUBMISSION RELATED DATA PACKAGE

PRODUCT MANAGER, NO. JOANNE MILLER 23

PRODUCT NAME(S) SUPER WHIP

TYPE PRODUCT F R I N H D HERBICIDE

COMPANY NAME HOECHST CELANESE CORPORATION

SUBMISSION PURPOSE REVIEW ATTACHED STUDIES FOR PROPOSED REGISTRATION ON **SOYBEANS AND RICE**

COMMON CHEMICAL NAME FENOXAPROP-ETHYL

REVIEWER: RICK PETRIE

EEB Review

**Chemical:** Super Whip Herbicide

## 100 Submission Purpose and Label Information

### 100.1 Submission Purpose and Pesticide Use

The registrant has submitted eight studies in support of the Section 3 registration of Super Whip herbicide. In a previous EEB review (Petrie, 08/21/90), the following outstanding studies were requested: 1.) 72-3, acute Mysid shrimp LC50, and 2.) 123-2, Non-target Aquatic Plant Growth Studies in Support of Aerial Application, to include: Lemna gibba, Skeletonema costatum, Anabaena flos-aquae, and a freshwater diatom.

The eight studies submitted are:

1.) 72-1 (a) acute Bluegill Sunfish using Super Whip 95.6% technical (MRID - 420096-03).

2.) 72-1 (c) acute Rainbow Trout using Super Whip 95.6% technical (MRID - 420096-04).

3.) 72-1 (C) acute Rainbow Trout using Super Whip 95.6% technical (MRID - 420096-05).

4.) 72-2 (a) acute Daphnia magna using Super Whip 95.6% technical (MRID - 420096-06).

5.) 72-3 (c) acute Mysid Shrimp using Super Whip 95.6% technical (MRID - 420096-07).

6.) 72-3 (c) acute Mysid Shrimp using Whip 96.8% technical (MRID - 420096-08).

7.) 123-2 Non-target Aquatic Plant using Selenastrum capricornutum using Super Whip 97.4% technical (MRID - 420096-09).

8.) 123-2 Non-target Aquatic Plant using Selenastrum capricornutum using Whip 96.8% technical (MRID - 420096-10).

Proposed Super Whip use sites are rice, soybeans, and set-aside conservation reserve acres.

2

100.2 **Formulation Information (Super Whip)**

ACTIVE INGREDIENTS:

fenoxaprop-P-ethyl: (+)-ethyl 2-[4[(6-chloro-2-benzoxazolyl) oxy] phenoxy] propanoate...6.27%*

INERT INGREDIENTS:

.....93.73%**

* Equivalent to 0.55# ai/gallon

** Contains petroleum distillates

100.3 **Application Methods, Directions, Rates**

Super Whip is a selective postemergence herbicide used for control of annual and perennial grassy weeds. The weeds turn yellow 4-10 days after application and die in 12-21 days. The label cautions "Since many grass crops are sensitive to Super Whip herbicide including sorghum and corn, avoid all direct or indirect contact to neighboring fields." Super Whip herbicide does not control broadleaf weeds or sedges.

Super Whip can be applied with ground or aerial application equipment. Air application recommendations such as using a minimum spray pressure of 20 psi, the use of D-9 spray nozzles that give 150-300 micron droplets, the recommendation not to use raindrop nozzles, and the recommendation to fly more than 10 feet above the crop are all factors that may lead to increased off-target drift during application. The label prohibits application by air if wind speed exceeds 8 MPH.

A maximum of 2.0 pints/A (0.138# ai) Super Whip is allowed per season in soybeans. Each application can range from 0.75 (0.052#ai) to 1.0 (0.069#ai) pint per acre; no more than 2 treatment per growing season. In rice a maximum of 2.4 pints per acre (0.165# ai) are allowed per season, a maximum of 2 treatments ranging from 0.9 to 1.2 pints per acre per application (0.062 to 0.0825# ai/A) per treatment. On conservation reserve acres, 0.9 to 1.4 pints per acre are recommended with no limitation or maximum number of treatments per year (0.062 to 0.096# ai/A treatment).

100.4 **Target Organisms**

Control of emerged annual and perennial grassy weeds (foxtail, volunteer corn, wild sorghum/millet species, panicum, wild oats, crabgrass, rhizome johnsongrass). No broadleaf weeds are listed on the proposed label. Super Whip will be used on a grass species (rice) to selectively control grassy weeds.

100.5 **Precautionary Labeling**

"This pesticide is toxic to fish. Do not apply directly to a body of water outside of the treated rice field. Do not apply when weather conditions favor drift. Do not contaminate arable land and/or water when disposing of equipment washwaters. Since many grass species are sensitive to Super Whip Herbicide, including sorghum and corn, avoid all direct or indirect contact to neighboring fields. Do not apply by aircraft when wind speeds exceed 8 mph."

"Do not plant any rotational crop in treated fields for 30 days after application (120 days for small grains). Do not apply Super Whip in areas where catfish and crayfish are commercially cultivated. Do not use rice irrigation water to irrigate crops not registered for use with Super Whip Herbicide within 14 days of last application of this product. Do not apply less than 65 days before harvesting rice. Do not apply within 14 days after activation of fertilizer. Do not tank mix Blazer, Propanil, Ordram, phenoxy herbicides, or liquid fertilizer. Do not apply within 7 days after Furadan. Do not use on the rice varieties Mars or Lear as damage to these varieties may occur. Do not harvest or graze cover crops protected with Super Whip. Do not apply this product through any type of irrigation system."

The rice label directions restrict use in areas of Arkansas inhabited by the fat pocketbook pearly mussel (Potanilus Capax). (This is a self imposed label statement by the registrant.)

101. **Hazard Assessment**

101.1 **Discussion**

Super Whip contains the same active ingredient as the currently registered rice herbicide Whip, but the mixture of active enantiomers is different. The Super Whip formulation contains a higher percentage of the d

enantiomer than Whip, making it more biologically active. The ratios are: Whip, 50:50, d to 1; Super Whip 85:15, d to 1. To compensate for the higher level of activity the Super Whip product is formulated as 0.55# active ingredient per gallon vs 1.0# active ingredient per gallon for the Whip product. The maximum Super Whip use rate in rice per application has been reduced from 0.2# active ingredient per acre for Whip to 0.0825# active ingredient per acre for Super Whip; a 2.4 x reduction. The two Mysid studies listed under 100.1 and the two Selenastrum studies listed under 100.1 compare the toxicity of Whip technical vs Super Whip technical.

101.2 **Likelihood of Adverse Effects To Nontarget Organisms**

**Terrestrial Organisms**

Acute contact LD50 data previously submitted for Whip herbicide indicates that fenoxaprop-P-ethyl at Super Whip label rates should pose no hazard to honey bees.

Fenoxyprop-p-ethyl was classified as "practically nontoxic" to birds as follows:

| Bird Study | Formulation | LD/LC50 |
|---|---|---|
| mallard duck dietary | 96.6% tech | >5620 ppm |
| bobwhite quail " | 96.6% tech | >5620 ppm |
| bobwhite acute oral | 96.6% tech | >2510 ppm |

Two avian reproduction studies were reviewed in 06/20/86. No significant adverse effects to Mallard or Bobwhite were noted at rates up to the maximum tested concentration of 180 ppm. The NOEL for both studies was considered to be 30 ppm.

From a previous review (proposed registration of Whip 1EC, 5/03/89), the mammalian LD50 is: >2000 mg/kg. Assuming a maximum application rate of 0.096# active ingredient per acre, (one conservation reserve treatment at maximum rate), the following residues could be expected immediately after application:

| | |
|---|---|
| Long grass | 11.0 ppm |
| Short grass | 23.0 ppm |
| leaves, leafy crops | 12.0 ppm |
| forage | 6.0 ppm |
| pod crops, legumes | 1.0 ppm |

5

| | |
|---|---|
| tree fruits | 0.7 ppm |
| small insects | 6.0 ppm |
| large insects | 1.0 ppm |

These values are well below the $LC_{50}$ values for mallard duck and bobwhite quail. The mammalian LC50 value is 20,000 ppm. No adverse acute effects to mammalian species are expected. In a previous EAB review (Study 12- Review dated 12/02/86 for fenoxaprop-P-ethyl), the turfgrass perennial ryegrass was sprayed with 0.5# active ingredient per acre of Whip 1EC (approximately 6x the Super Whip rate). In this study, dislodgeable residues dissipated with a half-life of < 3 hours (from 11 to 1.5 ppm).
The half-life of total extractable residues was 1 to 3 days. Based on these data, the hazard from use of repeat applications of Super Whip is expected to be minimal to birds, mammals, and insects.

**Aquatic Organisms**

**PAST REVIEWS**

Past EEB reviews have addressed adverse effects of Whip and Super Whip to aquatic organisms.

Based on $LC_{50}$ tests conducted previous to this submission for Whip technical and tests conducted using Super Whip technical, the following comparisons were made:

| Whip | Super Whip |
|---|---|
| Bluegill - $LC_{50}$ = 3.4 ppm | $LC_{50}$ = 4.7 ppm |
| Rainbow trout - $LC_{50}$ = 3.4 ppm | $LC_{50}$ = 2.4 ppm |
| Daphnia magna - $LC_{50}$ = 11.5 ppm | $LC_{50}$ = 6.0 ppm |
| Mysid Shrimp - $LC_{50}$ = 1.7 ppm | NO DATA |

Based on the Daphnia magna comparison the EEB concluded that the Super Whip formulation may be approximately twice as toxic as the Whip formulation to aquatic invertebrates; and that the most sensitive aquatic species is most likely the Mysid shrimp. Because of the absence of a Super Whip Mysid shrimp study, one was requested of the registrant in July 1988 and received 10/89. This Super Whip Mysid shrimp study was reviewed and classified as INVALID due to the inability to maintain 70% of the test material in solution for the duration of the study.

A Selanastrum capricornutum (freshwater green algae) Tier II study was submitted by the registrant in 10/89 and reviewed. This study was classified as SUPPLEMENTAL. The 120 hour $EC_{50}$ was 34 ppm; with a no-effect level approximately 10 ppm.

## NEW STUDIES

### MYSID SHRIMP

The two flow-thru Mysid shrimp studies in this submission compare technical Whip with technical Super Whip. Both studies were classified as CORE with the following results:

WHIP TECHNICAL 96 HR. LC50 = 0.107 mg ai/L (measured conc.)
(MRID 420096-08)
SUPER WHIP TECHNICAL 96 HR. LC50 = 0.109 mg ai/L (measured)
(MRID 420096-07)

Both formulations of fenoxaprop-ethyl are comparable in toxicity to Mysid shrimp and are classified as highly toxic to shrimp. This classification triggers the requirement for a 72-4 Mysid shrimp early life stage study. The Super Whip label must state that this pesticide is toxic to aquatic invertebrates.

### FRESHWATER GREEN ALGAE

The two Selenastrum capricornutum aquatic plant growth studies in this submission compare technical Whip with technical Super Whip. The Whip study was classified as CORE and the Super Whip study was classified as SUPPLEMENTAL with the following results:

| | | |
|---|---|---|
| WHIP TECHNICAL 5 DAY (MRID 420096-10) | EC50 = 0.65 mg ai/L | (nominal conc.) |
| | EC25 = 0.34 mg ai/L | (nominal conc.) |
| | NOEC = 0.10 mg ai/L | (nominal conc.) |
| SUPER WHIP TECHNICAL 5 DAY (MRID 420096-09) | EC50 = 0.43 mg ai/L | (nominal) |
| | EC25 = 0.18 mg ai/L | (nominal) |
| | NOEC = 0.03 mg ai/L | (nominal) |

The Super Whip formulation is slightly more toxic to Selenastrum capricornutum than the Whip formulation.

RAINBOW TROUT

Two 72-1 (c) static acute Rainbow trout studies using technical Super Whip were submitted and reviewed. The only differences between the studies were the dates the studies were conducted and the age of the fish. One was classified as CORE and the other SUPPLEMENTAL as follows:

(MRID 420096-04, CORE) 96 HR LC50 = 0.46 mg ai/L (nominal)
NOEC = 0.24 mg ai/L

(MRID 420096-05, SUPPLEMENTAL) 96 HR LC50 = 0.58 mg ai/L
NOEC = 0.32 mg ai/L

Based on the above studies, Super Whip is classified as highly toxic to the Rainbow trout on an acute basis. This classification triggers the requirement for a 72-4 fish early life stage study. The label must (and does) state that Super Whip is toxic to fish.

BLUEGILL SUNFISH

A 72-1 (a) static acute Bluegill sunfish study was submitted for review. This study is classified as CORE with the following conclusions:

(MRID 420096-03, CORE) 96 HR LC50 = 0.58 mg ai/L (nominal)
NOEC = 0.32 mg ai/L

Based on the above study, Super Whip is classified as highly toxic to the Bluegill sunfish on an acute basis. This classification triggers the requirement for a 72-4 fish early life stage study. The label must (and does) state that Super Whip is toxic to fish.

Daphnia magna

A 72-2 (a) Daphnia magna static acute aquatic invertebrate study was submitted for review. This study is classified as INVALID. Concentrations of test chemical analyzed were too variable to draw conclusions regarding daphnid exposure to the test compound.

## AQUATIC HAZARD ASSESSMENT (SUMMARY)

| | WHIP | SUPER WHIP |
|---|---|---|
| Bluegill | LC50 = 0.31 ppm (C) (Highly toxic) | LC50 = 4.70 ppm (C) (Moderately toxic)<br>LC50 = 0.58 ppm (C) (Highly toxic) |
| Pumpkinseed Sunfish | LC50 = 0.36 ppm (C) (Highly toxic) | |
| Rainbow Brown trout | LC50 = 0.48 ppm (C) (Highly toxic) | LC50 = 2.40 ppm (C) (Moderately toxic)<br>LC50 = 0.46 ppm (C) (Highly toxic)<br>LC50 = 0.58 ppm (S) (Highly toxic) |
| Daphnia | LC50 = 3.18 ppm (C) (Moderately toxic)<br>11.50 ppm (C) (Slightly toxic) | LC50 = 6.00 ppm (C) (Moderately toxic) |
| Juvenile Crayfish | LC50 = 1.10 ppm (S) (Moderately toxic) | NONE AVAILABLE |

ESTUARINE SPECIES

| | | |
|---|---|---|
| M. shrimp | LC50 = 1.70 ppm (C) (Moderately toxic)<br>LC50 = 0.11 ppm (C) (Highly toxic) | LC50 = 0.11 ppm (C) (Highly toxic) |
| E. oyster | EC50 = 0.25 mg/L (S) (Highly toxic) | NONE AVAILABLE |
| S. minnow | LC50 = >1.0 ppm (S) (Moderately toxic) | NONE AVAILABLE |
| Q. clam | EC50 = 0.20 mg/L (C) (Highly toxic) | NONE AVAILABLE |

(C)=CORE, (S)=SUPPLEMENTAL

PLANTS

| | | |
|---|---|---|
| Selenastrum capricornutum | EC50 = 0.34 ppm (C) | EC50 = 34.00 ppm (C)<br>EC50 = 0.43 ppm (S) |

(C) = CORE, (S) = SUPPLEMENTAL.

ONE-TENTH THE MOST TOXIC LC50 VALUE FOR SUPER WHIP:

| | | |
|---|---|---|
| Bluegill | 0.058 ppm | |
| Rainbow trout | 0.046 ppm | |
| Daphnia magna | 0.600 ppm | |
| Mysid shrimp | 0.011 ppm | |
| E. oyster* | 0.025 ppm | *Based on Whip data. |
| Sheepshead minnow* | 0.100 ppm | |
| Quahog clam* | 0.020 ppm | |

**EXPECTED ENVIRONMENTAL CONCENTRATIONS (EEC's)**

**SOYBEANS**: (Super Whip)

The proposed Super Whip label recommends a maximum per acre application rate of 0.069# ai on soybeans, to be applied with aerial or ground application equipment. The total maximum amount allowed per season is 0.138# ai/Acre.

1) Drift = 0.069# ai x 5% = 0.00345# ai off-target.
   6 ft. water body = 0.214 ppb
   6 in. water body = 2.570 ppb

2) Run-off To Aquatic Areas From Aerial Application
   0.069# ai x 60% x 1% x 10A = 0.00414# ai run-off.

3) Run-off To Terrestrial Areas From Aerial Application
   0.069# ai x 60% x 1% x 1A = 0.00041# ai run-off.

4) Run-off To Aquatic Areas From Ground Application
   0.069# ai x 1% x 10A = 0.0069# ai run-off.

5) Run-off to Terrestrial Areas From Ground Application
   0.069# ai x 1% x 1A = 0.0007# ai run-off.

Total off-target movement to aquatic areas (aerial use), add 1) and 2) = 0.00345# ai
+ 0.00414# ai
---
0.00759# ai TOTAL  6 ft. water body = 0.463 ppb
6 in. water body = 5.571 ppb

Total off-target movement to terrestrial areas (aerial use), add 1) and 3) = 0.00345# ai
+ 0.00041# ai
---
0.00386# ai TOTAL

Total off-target movement to aquatic areas (ground application) 4) = 0.0069# ai TOTAL  6 ft. water body = 0.421 ppb
6 in. water body = 5.070 ppb

**RICE**: (Super Whip)

The proposed Super Whip label recommends a maximum per acre application rate of 0.0825# ai on rice, to be applied with aerial or ground application equipment. The total maximum amount per season on rice is 0.164# ai/Acre.

1) Drift = 0.0825# ai x 5% = 0.00413# ai off-target
6 ft. water body = 0.252 ppb
6 in. water body = 3.028 ppb

2) Run-off To Aquatic Areas From Aerial Application
0.0825# ai x 60% x 1% x 10A = 0.00495# ai runoff.

3) Run-off To Terrestrial Areas From Aerial Application
0.0825# ai x 60% x 1% x 1A = 0.00050# ai runoff.

4) Run-off To Aquatic Areas From Ground Application
0.0825# ai x 1% x 10A = 0.00825# ai runoff.

5) Run-off To Terrestrial Areas From Ground Application
0.0825# ai x 1% x 1A = 0.00083# ai runoff.

Total off-target movement to aquatic areas (aerial use), add 1) and 2) = 0.00413#
+ 0.00495#
---
0.00908# ai TOTAL  6 ft. water body = 0.554 ppb
6 in. water body = 6.665 ppb

Total off-target movement to terrestrial areas (aerial use), add 1) and 3) = 0.00413#
+ 0.00050#
---
0.00463# ai TOTAL

Total off-target movement to aquatic areas from ground use 4) = 0.00825# ai TOTAL
6 ft. water body = 0.506 ppb
6 in. water body = 6.092 ppb

**CONSERVATION RESERVE (SET ASIDE) ACRES**: Super Whip

The proposed Super Whip label recommends a maximum per acre application rate of 1.4 pints/Acre (0.09625# ai/Acre). The total number of applications per acre per year is not specified on the label. The proposed label does not give specific ground or aerial application equipment instructions as is the case for soybeans and rice. Based on general aerial use statements, it is assumed that Super Whip will be applied aerially to set aside acres.

1) Drift = 0.09625# ai x 5% = 0.0048# ai off-target
6 ft. water body = 0.293 ppb
6 in. water body = 3.523 ppb

2) Run-off To Aquatic Areas From Aerial Application
0.09625# ai x 60% x 1% x 10A = 0.0058# ai runoff.

3) Run-off To Terrestrial Areas From Aerial application
0.09625# ai x 60% x 1% x 1A = 0.0006# ai runoff.

4) Run-off To Aquatic Areas From Ground Application
0.09625# ai x 1% x 10A = 0.0096# ai runoff.

5) Run-off To Terrestrial Areas From Ground Application
0.09625# ai x 1% x 1A = 0.0010# ai runoff

Total off-target movement to aquatic areas (aerial use), add 1) and 2) = 0.0048# ai
+ 0.0058# ai
---
0.0106# ai TOTAL
6 ft. water body = 0.647 ppb
6 in. water body = 7.780 ppb

Total off-target movement to terrestrial areas (aerial use), add 1) and 3)= 0.0048# ai
+ 0.0006# ai
---
0.0054# ai TOTAL

Total off-target movement to aquatic areas from ground application 4) = 0.0096# ai TOTAL
6 ft. water body = 0.586 ppb
6 in. water body = 7.046 ppb

Aquatic Animals

Based on the maximum soybean, rice, and conservation reserve acre label rates, Super Whip is not expected to adversely affect non-target freshwater fish, aquatic invertebrates, or estuarine organisms on an acute basis when applied by ground or aerial equipment.

Chronic effects from use of repeat applications of Super Whip on non-target freshwater fish and aquatic invertebrates cannot be determined. Because of the high toxicity of Super Whip to the rainbow trout, the bluegill sunfish, and the Mysid shrimp (plus the assumed high toxicity to the Eastern oyster and the Quahog clam based on Whip data), two 72-4 early life stage studies are required; one with bluegill sunfish or rainbow trout and one with the Mysid shrimp.

Aquatic Plants

Based on the maximum soybean, rice, and conservation reserve acre label rates, Super Whip is not expected to adversely affect non-target freshwater green algae; ground or aerial use. However, because of potential for off-target drift from aerial applications, a complete aquatic plant risk assessment cannot be done until after receipt and review of the following previously requested Tier II studies: Lemna gibba, Skeletonema costatum, Anabaena flos- aquae, and a freshwater diatom. Aerial application of Super Whip is not recommended until after receipt and validation of the above listed studies, plus the required drift studies 201-1 and 202-1.

Terrestrial Plants

Based on Tier II vegetative vigor and seed germination studies submitted to EEB in October 1989 for Super Whip, the Gramineae family of plants are the most sensitive to Super Whip herbicide. These tests are summarized as follows:

Lowest $EC_{25}$ values

| | SGSE | VV |
|---|---|---|
| Corn - | 0.0020#ai/A (RL) | 0.0025 #ai/a (H) |
| Oat - | 0.0096#ai/A (RL) | 0.0780 #ai/A (W) |
| Ryegrass | -0.0578#ai/A (H) | 0.0817 #ai/A (H) |

Lowest $EC_{50}$ Values

| | SGSE | VV |
|---|---|---|
| Corn - | 0.0090 (RL) | 0.0110 (H) |
| Oat - | 0.0270 (RL) | 0.0986 (W) |
| Ryegrass - | 0.0910 (H) | 0.1370 (H) |

**RL = radicle length**
**H = Height**
**W = Weight**

Runoff of Super Whip from a one acre rice, soybean, or set-aside field to an adjacent one acre area (based on the maximum label rates per acre) is not expected to adversely affect the germination or emergence of non-target terrestrial plants.

The aerial use of Super Whip is expected to result in adverse effects on non-target terrestrial grass plants (when used on rice, soybeans, and set-aside acres). The EEC values for the three proposed use sites (rice - 0.0046# ai, soybeans - 0.0039#, set-aside acres - 0.0054#) exceed the EC25 value for the most sensitive test species (corn - 0.0025# ai). A Tier III terrestrial non-target phytotoxicity field study is required. The EEB suggests that all outstanding non-target plant and drift studies be submitted prior to approval of aerial application.

101.3 Endangered Species Considerations

Super Whip is not expected to adversely affect endangered birds, mammals, insect species, aquatic invertebrates, freshwater fish, or freshwater green algae on an acute basis from ground or aerial applications to soybeans, rice, and set-aside acres. A complete risk assessment for aquatic plants cannot be conducted due to the absence of 4 required Tier II studies. Chronic risk assessments for fish and crustaceans cannot be conducted due to the absence of chronic studies.

AQUATIC ONE-TWENTIETH LC50 VALUES (Super Whip):

| | |
|---|---|
| Bluegill | - 5.8 ppb |
| Rainbow trout | - 4.6 ppb |
| Daphnia magna | - 60.0 ppb |
| Mysid shrimp | - 1.1 ppb |
| E. oyster* | - 12.5 ppb |
| S. minnow* | - 50.0 ppb |
| Q. clam* | - 10.0 ppb |

*Based on Whip data.

ESTIMATED ENVIRONMENTAL CONCENTRATIONS (6 ft. water bodies)

| CROP | AERIAL | GROUND |
|---|---|---|
| SOYBEANS | 0.5 ppb | 0.4 ppb |
| RICE | 0.6 ppb | 0.5 ppb |
| SET-ASIDE | 0.7 ppb | 0.6 ppb |

ESTIMATED ENVIRONMENTAL CONCENTRATIONS (6 in. water bodies)

| CROP | AERIAL | GROUND |
|---|---|---|
| SOYBEANS | 5.6 ppb | 5.1 ppb |
| RICE | 6.7 ppb | 6.1 ppb |
| SET-ASIDE | 7.8 ppb | 7.1 ppb |

The 6 inch EEC values trigger freshwater fish and crustacean concerns. After consulting with Larry Turner (Endangered Species Expert EEB/EFED) the EEB concludes that there are no freshwater or estuarine fish species at risk from use of Super Whip on soybeans, rice, and set-aside acres. Also, endangered/threatened crustaceans are not located in the proposed Super Whip use areas and, therefore, are not expected to be exposed to drift or run-off residues. (The Nashville crayfish is located in the city of Nashville, and the Alabama cave shrimp is located in a cave considered remote from cropland areas).

ENDANGERED PLANT SPECIES

The following endangered grass species are listed by the Fish And Wildlife Service and may be potentially at risk from the aerial use of Super Whip on rice, soybeans, or set-aside acres:

Solanograss in California (counties of Colusa, Contra Costa, Fresno, Glenn, Madera, Merced, San Jaquin, Solano, Stanislaus, Tehama)

Eureka Valley Dunegrass in California (county of Inyo)

Carters Panicgrass in Hawaii (Island of Oahu)

Texas Wild Rice in Texas (county of Hays)

101.4 Adequacy of Toxicity Data

Refer to 100.1 for a complete list of the eight studies reviewed in this submission. The studies are classified as follows:

| STUDY NUMBER | | CLASSIFICATION |
|---|---|---|
| 1.) MRID - 420096-03 | - | CORE |
| 2.) MRID - 420096-04 | - | CORE |
| 3.) MRID - 420096-05 | - | SUPPLEMENTAL |
| 4.) MRID - 420096-06 | - | INVALID |
| 5.) MRID - 420096-07 | - | CORE |
| 6.) MRID - 420096-08 | - | CORE |
| 7.) MRID - 420096-09 | - | SUPPLEMENTAL |
| 8.) MRID - 420096-10 | - | CORE |

Chronic hazard assessments for fish and crustaceans, and a hazard assessment for aquatic plants cannot be conducted until after receipt of outstanding studies. Refer to 103.0 Conclusions for a list of outstanding studies.

101.5 Adequacy of Labeling

1.) Instead of the statement "This pesticide is toxic to fish.", the following statement is recommended: "This pesticide is toxic to aquatic organisms including fish, shrimp, oysters, and clams."

2.) The proposed Super Whip label must state that aerial application is not allowed. Endangered grass species listed under section 101.3 above are not expected to be at risk from ground only application of Super Whip to rice, soybeans, and set-aside acres. If aerial application is deleted, no Fish and Wildlife Service jeopardy opinion will be needed for these species.

3.) The proposed set-aside acres section of the Super Whip label must specify the maximum number of applications allowed per acre per year and provide the user with specific application equipment instructions.

4.) The endangered species labeling for the fat pocketbook pearly mussel (Potamilus capax) is not required for the proposed rice, soybean, and conservation reserve acreage Super Whip label.

103 **Conclusions**

Based on comparative studies submitted plus previously submitted data, the following summary indicates comparable toxicity of technical Whip and technical Super Whip with the exception of Mysid shrimp:

| SPECIES | WHIP | SUPER WHIP |
|---|---|---|
| Bluegill sunfish | Highly Toxic | Highly Toxic |
| Rainbow trout | Highly Toxic | Highly Toxic |
| Daphnia magna | Moderately Toxic | Moderately Toxic |
| Mysid shrimp | Moderately Toxic | Highly Toxic |
| Selenastrum capricornutum | EC50 = 0.34 ppm | EC50 = 0.43 ppm |

The acute hazard to non-target and endangered/threatened avian species, mammalian species, beneficial insects, freshwater fish, aquatic invertebrates, estuarine aquatic species, and freshwater green algae from use of Super Whip on soybeans, rice, and set-aside acres is expected to be minimal. (Aerial or ground application methods).

Chronic hazard to non-target and endangered/threatened avian species and mammalian species is expected to be minimal.

The high toxicity of Super Whip (<1.0 ppm) to aquatic freshwater and estuarine/marine species triggers 72-4 early life stage studies for a freshwater fish species and the Mysid shrimp. Chronic hazard assessments for fish and crustaceans cannot be conducted until after receipt of these studies.

Non-target and endangered/threatened terrestrial grass species are at risk from the aerial application of Super Whip to soybeans, rice, or set-aside acres. Aerial application of Super Whip is not recommended until after receipt of 1.) all outstanding non-target plant studies, 2,) 201-1 and 202-1 drift data and, 3.) a jeopardy opinion from the Fish and Wildlife Service.

The ground application of Super Whip is not expected to adversely affect non-target or endangered/threatened terrestrial plant species.

A non-target aquatic plant risk assessment cannot be conducted until after receipt of outstanding aquatic plant studies.

The following studies are outstanding:

1.) 123-2 Tier II non-target aquatic plant growth using

Lemna gibba
Sleletonema costatum
Anabaena flos-aquae
a freshwater diatom

These studies are required for any aerial application of an herbicide. If aerial application is dropped from proposed labeling, only Lemna gibba would be outstanding.

2.) 124-1 Tier III non-target plant terrestrial field study. This study is not required until after development of an EEB/EFED guidance document, expected to be completed by Spring of 1993.

3.) 201-1, 202-1 Drift Studies to be submitted to the EFGWB/EFED. We defer to the EFGWB regarding the timing of submission of these studies.

The following new studies are required:

1.) 72-4 Fish Early Life Stage,

2.) 72-4 Mysid Early Life Stage.

Richard C. Petrie 2/20/92
Richard C. Petrie, Agronomist
Ecological Effects Branch
Environmental Fate and Effects Division (H7507-C)

Daniel Rieder 2-25-92
Daniel Rieder, Head - Section 3
Ecological Effects Branch
Environmental Fate and Effects Division (H7507-C)

Douglas J. Urban 2/28/92
Douglas J. Urban, Acting Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507-C)