SHAUGHNESSEY NO. 128701

REVIEW NO. 2

EEB BRANCH REVIEW

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FILE OR REG. NO. 8340-EUP-I (Rice)

PETITION OR EXP. PERMIT NO. 4G3035, 3G2940, 8340-EUP-T(Soybeans)

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TYPE PRODUCT(S): I, D, H, F, N, R, S Herbicide

DATA ACCESSION NO(S). 072310

PRODUCT MANAGER NO. R. Mountfort (23)

PRODUCT NAME(S) WHIP 0.75 EC

COMPANY NAME American Hoechst Corporation

SUBMISSION PURPOSE Proposed EUP's for use on Rice and Soybeans

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
128701	HOE-33171; Ethyl2-[4-[(6-chloro-2-	
	benzoxazolyl)oxy]phenoxy]propanoate	

EEB BRANCH REVIEW

WHIP 0.75 EC Herbicide

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

Proposed EUP programs for the evaluation of selective postemergence annual and perennial grass control in soybeans and in rice.

See addenda for additional EUP program information.

100.2 Formulation Information

ACTIVE INGREDIENT:

ethyl 2-[4-[(6-chloro-2-benzoxazolyl)oxy] phenoxyl]propanoate.....	9.50%*
INERT INGREDIENTS:.....	90.50%
TOTAL	100.00%

* Equivalent to 0.75 pound of active ingredient per gallon

100.3 Application Methods, Directions, Rates

Soybeans

Ground Application: Whip herbicide should be applied in a minimum of ten (10) gallons of water per broadcast acre. Flat fan or hollow cone nozzles are recommended. Use 30 to 60 pounds per square inch sprayer pressure. Under dense weed/crop canopies, high spray pressure is very important in obtaining thorough coverage; therefore, use higher spray pressures under these conditions.

Air Application: Whip herbicide should be applied in a minimum of five (5) gallons of water per broadcast acre. Uniform spray coverage is most essential when using aircraft, and is achieved by the use of spray nozzle tips and spraying pressures which provide a small uniform droplet size (200-350 micron range). DO NOT USE raindrop nozzles. Spray no higher than ten (10) feet above the crop.

DO NOT apply Whip herbicide by aircraft when the wind is blowing at a velocity of eight (8) mph or greater. Avoid all direct or indirect contact to neighboring fields.

For application rates, see table (following page).

Rice

For use only in the states of Arkansas, Louisiana, Mississippi, and Texas.

Rice fields must be level and free of large clods to obtain uniform germination of grasses and to insure uniform flood levels. If necessary, fields may be flushed prior to treatment to produce uniform grass germination. If fields are flushed prior to treatment, flush in sufficient time so that grass and rice are growing vigorously at time of treatment. Water must be completely drained from fields before spraying to avoid crop injury and to assure that the grassy weeds are fully exposed to the spray.

a. Air Application: Whip should be applied aerially, using five (5) to ten (10) gallons of water per broadcast acre. Uniform spray coverage is most essential when using aircraft, and is achieved by the use of spray nozzle tips and spraying pressures which provide a small uniform droplet size (200-350 micron range). DO NOT USE raindrop nozzles. Spray no higher than ten (10) feet above the crop.

b. Ground Application: Whip herbicide should be applied in a minimum of ten (10) gallons of water per broadcast acre. Flat fan or hollow cone nozzles are recommended. Use 30 to 60 pounds per square inch sprayer pressure. Under dense weed/crop canopies, high spray pressure is very important in obtaining thorough coverage; therefore, use higher spray pressures under these conditions.

To insure thorough coverage and to avoid drift, DO NOT apply Whip when the wind is blowing at a velocity of eight (8) mph or greater. While broadleaf crops, such as cotton and soybeans are very tolerant to Whip herbicide, grassy crops, such as corn and sorghum, are extremely sensitive.

Timing of application

Rice is tolerant to Whip from 3-leaf through the early tillering (stooling) stages if recommended water management practices are followed. Optimal conditions for controlling grass usually occur when rice is in the 3-4 leaf stage. However, applications should be made following the rate and grassy weed recommendation chart below.

Soybeans

WHIP™ HERBICIDE RATE AND GRASS RECOMMENDATION CHART

Grass Species	Optimum Stage of Growth	Non-phytotoxic Oil Concentrate	Whip Herbicide * Application Rate		
			lbs. a.i/A	pts./A	Fl. Oz./A
Giant foxtail (Setaria faberi)	4- 8"	1 qt. w/ ground	.10	1.1	17
Volunteer corn (Zea mays)	10-16"	1 pint w/ aerial			
Wild Proso Millet (Panicum miliaceum)	5-10"				
Barnyardgrass (Echinochloa crusgalli)	3- 8"	OPTIONAL	.15	1.6	26
Broadleaf Signalgrass (Brachiaria platyphylla)					
Fall Panicum (Panicum dichotomiflorum)					
Bristle Foxtail (Setaria verticillata)					
Green Foxtail (Setaria viridis)					
Purple Foxtail (Setaria viridis robusta purpurea)					
Robust Foxtail (Setaria viridis robusta alba)					
Goosegrass (Eleusine indica)					
Jungle rice (Echinochloa colonum)					
Southwestern cupgrass (Eriochloa gracilis)					
Sprangletop (Leptochloa filiformis)					
Texas Panicum (Panicum texanum)					
Witchgrass (Panicum capillare)					
Wooly Cupgrass (Eriochloa villosa)					
Johnsongrass, Seedling (Sorghum halepense)	6-10"	OPTIONAL	.15	1.6	26
Wild Cane/Shattercane (Sorghum bicolor)	8-12"				
Large Crabgrass (Digitaria sanguinalis)	3- 4"	OPTIONAL	.15 - .20	1.6-2.1	26 - 34
Smooth Crabgrass (Digitaria ischaemum)					
Itchgrass (Rottboellia exaltata)					
Yellow Foxtail (Setaria lutescens)					
Wild Oat (Avena fatua)					
PERENNIAL GRASSES					
Johnsongrass from rhizomes (Sorghum halepense)	10-15"	DO NOT ADD OIL	.15	1.6	26
Second application if needed (regrowth) (A timely cultivation may override necessity of a second application)	10-15"		.10	1.1	17

* When controlling mixed populations of grassy weeds, always use the rate that will control the least susceptible species

Rate and Grassy Weed Recommendation Chart

Grass Species	Stage of Growth	Application Rate lbs ai/A	pts/A	fl oz/A
Sprangletop (Leptochloa spp.)	1-3 leaf			
Barnyardgrass, watergrass (Echinochloa crus-galli)	1-5 leaf			
Broadleaf Signalgrass (Brachiaria platyphylla)	1-5 leaf	.15	1.6	26
Goosegrass (Eleusine indica)	1-5 leaf			
Jungle rice (Echinochloa colonum)	1-5 leaf			
Crabgrass (Digitaria spp.)	1-4 leaf			
Johnsongrass (Sorghum halepense)	10-15 inches			

WATER MANAGEMENT:

An alternate flood program must be followed.

1. Rice fields must be level and free of clods. If desirable, fields may be flushed prior to treatment.

2. Rice fields should not be flushed or flooded within 7 days after treatment.

3. Flush or flooding should not exceed 3 inches in depth.

4. A deep permanent flood can be applied anytime after 21 days following treatment.

100.4 Target Organisms

Soybeans

Whip™ herbicide is a highly selective emulsifiable concentrate for use in the postemergence control of annual and perennial grassy weeds in soybeans. It does not control broadleaf weeds or sedges. Whip herbicide acts primarily through the foliage; therefore thorough coverage of emerged grasses is necessary.

Soybeans are tolerant to Whip herbicide at all stages of growth.

Whip herbicide kills grasses by systemic action. Visible effects begin as a general chlorosis (yellowing) followed by death of the weed. Visual injury of the grasses is evident approximately 4-10 days after application (dependent upon environmental conditions); but complete kill of the target grass will take 12-21 days.

Since many grass crops are sensitive to Whip herbicide, including sorghum and corn, avoid all direct or indirect contact to neighboring fields.

Rice

Whip herbicide is a highly selective emulsifiable concentrate for use in the postemergence control of annual and perennial grassy weeds in rice. Whip does not control broadleaf weeds or sedges. Whip acts primarily through the foliage; therefore, coverage of emerged grasses is necessary.

100.5 Precautionary Labeling

This pesticide is toxic to fish. Do not apply directly to water. Do not apply when weather conditions favor runoff or drift. Do not apply when weather conditions favor runoff or drift. Do not contaminate and/or water by cleaning of equipment and/or disposal of waste.

101 Hazard Assessment

101.1 Discussion (Soybeans)

EEB has developed a scenario for a soybean use pattern which assumes 1% runoff and a 40 acre drainage basin draining into a 2.5 acre pond 2.5 feet deep. (1% runoff is probably an over-estimate for this particular herbicide since HOE-33171 does bind to soil, however.) Employing this scenario, the Estimated Environmental Concentration is 4.7 ppb. Since this pesticide may also be applied aerially, the expected loss of the pesticide from the treated area would probably be greater than 1% (through runoff and aerial drift combined). Employing the same scenario as above and assuming a 2% loss, the resulting EEC would be 9.36 ppb.

101.2 Likelihood of Adverse Effects to Non-target Organisms (Soybeans)

Data submitted by the registrant indicate that outdoor usage of HOE-33171 should present no hazard to honey bees. HOE-33171 is practically non-toxic to birds both when administered through the diet and as an acute exposure. The use of Whip 0.75 on soybeans should not result in any hazard to avian wildlife.

HOE-33171 is highly toxic to fish, with an LC^{50} of 310 ppb to bluegill (the most sensitive species). In the worst case situation - the direct application of 0.20 lb a.i. of the pesticide to water - the resulting aquatic concentrations would surpass 1/10 of this LC_{50} value (147 ppb in 6" water), resulting in toxicity to this species.

In actual use and assuming a relatively low rate of runoff (1%), the resulting concentrations are low and would not adversely affect aquatic species (EEC = 4.6 ppb). If the potential for aerial drift (in addition to runoff) is included in these calculations, and assuming, therefore, a total loss from the treatment area of 2%, the resulting concentration of 9.36 ppb is still less than one-half the LC_{50} to fish. The proposed use of Whip 0.75 on soybeans should not result in hazard to aquatic species.

101.3 Endangered Species Considerations (soybeans)

The use of Whip 0.75 on soybeans should not result in hazard to endangered species.

101.4 Discussion (Rice)

At the proposed maximum application rate of 0.15 lbs. a.i./acre, the following concentrations may be expected in bodies of water of various depths (assuming that the pesticide is applied directly to water):

water depth	concentrations (ppb)
6 inches	110
12 inches	55
24 inches	28

New Bayou, a tributary of the Chocolate Bayou Estuary in the Galveston-Trinity Bay Complex, exemplifies bayous in this rice agricultural area. EEB has developed an aquatic EEC scenario for a rice use pattern by employing the following features of New Bayou and the surrounding area: Two rice fields adjacent to the bayou (comprising c.200 acres) drain into New Bayou 0.6 miles above its confluence with the larger Mustang Bayou. New Bayou averages 20 feet wide with an average depth of 2 feet within this 0.6 mile stretch (total surface area calculated to be 1.45 acres).

Employing this scenario and assuming a loss from the rice fields of 1% (through flushing of the fields), the Estimated Environmental Concentration in New Bayou would be 37.9 ppb. Assuming an additional loss of 0.5% from the fields due to aerial drift, the resulting EEC would be 57.2 ppb. (0.15 lb a.i. x 200 ac = 30 lbs; 30 x 1.5% = .45 lbs; interpolated value from water concentrations chart, 83 ppb ÷ 1.45 ac = 57.2 ppb.) Mitigating factors which may result in a lower rate of pesticide entering aquatic systems would include: (1) an aerobic soil half-life of less than 1 day, (2) the herbicide is applied to dry fields, (3) the herbicide binds to soils, and (4) the label directs that fields should not be flushed or flooded within 7 days after treatment.

101.5 Likelihood of Adverse Effects to Non-target Organisms (Rice)

As discussed in section 101.2, the use of Whip 0.75 should present no hazard to honey bees or avian wildlife.

HOE-33171 is highly toxic to fish, with an LC_{50} of 310 ppb to bluegill (the most sensitive species). The formulated product (9.5%) is much less toxic to fish, with an LC_{50} to bluegill of 2.86 ppm. In the worst case situation - the direct application of the pesticide to water - the resulting aquatic concentrations (at 6 and 12 inches) would surpass 1/10 of the LC_{50} value of the technical product (31 ppb), resulting in toxicity to fish.

In actual use, assuming a runoff rate of 1% and an additional loss from the field of 0.5% due to spray drift, an aquatic EEC of 57.2 ppb is calculated. This concentration is less than 1/2 the LC_{50} to fish and as such should not result in acute hazards to aquatic organisms. Additionally, because of the mitigating factors mentioned in the previous section, the concentrations which may result in aquatic systems should not be sufficient to cause chronic hazard to aquatic organisms.

101.6 Endangered Species Considerations (Rice)

The use of Whip 0.75 on rice may result in aquatic concentrations which would exceed 1/20 the LC_{50} of the most sensitive aquatic species (1/20 310 ppb = 15.5 ppb). Such concentrations would result in unreasonable adverse effects to endangered aquatic species. One area of concern is in Arkansas where the fat pocketbook pearly mussel, Potamilus capax, is found in the White and St. Francis Rivers which flow through the rice regions.

101.7 Adequacy of Toxicity Data

Three studies (bluegill sunfish, rainbow trout, and Daphnia magna) were included with this submission. They were all found to be scientifically sound. The studies indicate that a 9.5% formulated product of HOE-033171 is moderately toxic to bluegill sunfish and rainbow trout and slightly toxic to Daphnia magna. The studies do fulfill a requirement (for the rice use pattern) for aquatic toxicity studies performed on this formulated product.

The high octanol/water partition coefficient (19,100) of this chemical may indicate a potential for accumulation in biological systems. A fish accumulation study was found inadequate by EAB to support registration. This problem can be further addressed upon receipt and evaluation of an acceptable fish accumulation study by EAB.

102 Conclusions

EEB has reviewed these EUP applications for the use of Whip 0.75 EC Herbicide on soybeans and on rice. Based upon available data, EEB concludes that these EUP programs provide for minimal hazards to nonendangered nontarget organisms. However, the EUP program for rice provides for potentially serious hazards to endangered aquatic nontarget organisms.

In order to mitigate this hazard, the EUP program for rice should not be conducted in areas where impact to endangered or threatened aquatic species is likely. Prior to the use of this product in rice growing areas, the users of this product must contact the Office of Endangered Species (Endangered Species Specialist) or the local Department of Fish and Game to determine if any endangered or threatened species are located adjacent to the treated areas. This product must not be used in areas where impact to endangered/threatened species is likely/

Carol M. Natella 4-19-84

Carol M. Natella
Wildlife Biologist
Ecological Effects Branch

Harry Craven 4-19-84

Harry Craven
Section Head, Section 4
Ecological Effects Branch

4/19/84

Clayton Bushong, Chief
Ecological Effects Branch

Fenoxaprop-ethyl scientific review

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___ Identity of product inert ingredients

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___ Description of the product manufacturing process

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___ Identity of the source of product ingredients

___ Sales or other commercial/financial information

___ A draft product label

___ The product confidential statement of formula

___ Information about a pending registration action

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