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Branch Files

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SHAUGHNESSY NO.

REVIEW NO.

EEB REVIEW

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PETITION OR EXP. NO. \_\_\_\_\_

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RD ACTION CODE/TYPE OF REVIEW 510

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

DATE ACCESSION NO (S). \_\_\_\_\_

PRODUCT MANAGER NO. PM 41

PRODUCT NAME (S) Goal

COMPANY NAME Illinois Dept. of Agriculture

SUBMISSION PURPOSE Section 18 to control broadleaf weeds on  
horseradish crops

SHAUGHNESSEY NO.	CHEMICAL AND FORMULATION	% A.I.
_____	Oxyfluorfen	19.4%
_____	_____	_____
_____	_____	_____
_____	_____	_____

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## Ecological Effects Branch Review

### 100.0 Submission Purpose and Label Information

#### 100.1 Submission Purpose and Pesticide Use

The State of Illinois Department of Agriculture has requested that exemption be granted for emergency use of Goal 1.6 EC herbicide for control of broadleaf weeds on horseradish crops in Monroe, St. Clair, and Madison counties. The alternative weed control herbicides are Dacthal 75WP and Roundup 45. Dacthal 75 WP requires high application rates and is primarily an annual grass control chemical. It does not, it is felt by Department, offer consistent weed control for the entire growing season. Roundup 45, while effective, cannot be applied during the growing season and provides no residual control. Hand weeding and cultivation are not felt to be cost effective with an average additional cost of \$300 - \$380.00 per acre compared with an estimated \$50.00 per acre if Goal is used.

The total acreage proposed for weed control is not to exceed 1,000 acres. The State was granted an emergency exemption for this use pattern in 1989, however the exemption was received after crops had begun to emerge. It is hoped this request will be granted before the March growing season begins in order to allow application prior to crop emergence.

#### 100.1 Formulation Information

Goal 1.6E

Active Ingredient: Oxyfluorfen ..... 19.4 %  
Inert Ingredients ..... 80.6 %

Manufactured by Rohm and Haas Company under EPA registration numbers 707-174. The herbicide is presently registered for pre-emergent, post-emergent and post-directed application on artichokes (globe), citrus (nonbearing), conifers (seed beds, transplants, and container stock), corn, cotton, fallow bed, mint, onions, treefruit, cabbage, broccoli, and cauliflower.

#### 100.3 Application Methods

The herbicide is to be applied by certified private applicators and/or licensed commercial applicators or persons under their direct supervision.

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Label instructions are as follows:

Apply 2.5 pints of Goal 1.6EC herbicide (0.5 pounds active ingredient) per acre pre-emergence to horseradish  
.....

Goal 1.6EC should be thoroughly mixed with clean water, at recommended concentrations and applied in a minimum of 40 gallons of water per acre. Use conventional ground spray equipment with flat spray nozzles, at 20 to 40 psi.

Restrictions include a single application per growing season(0.5 lb ai/acre) and no application 60 days prior to harvest.

**100.4 Target Organisms**

Several species of broadleaf weeds are the target organisms for this application. They include; pigweed, Amaranthus sp., lambsquarter, Chenopodium album, Pennsylvania smartweed, Polygonum pensylvanica, common purslane, Portulaca oleracea, eastern black nightshade, Solanum ptycanthum, ivy leaf morningglory, Ipomeoea hederacea, and velvetleaf, Abutilon theophrasti.

**100.5 Precautionary Labeling (exerpted from earlier review 1/30/90**

"Do not apply directly to water or wetlands. Do not contaminate water by cleaning of equipment or disposal of waste.

This product is highly toxic to aquatic invertebrates, aquatic plants, wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water or wetland area. Do not apply when weather conditions favor drift or erosion from target areas."

**101.0 Hazard Assessment**

**101.0 Discussion:** The state of Illinois request is for a single broadcast spray application of Goal 1.6 EC between March 30 and June 15, 1990. The expected environmental concentration of Goal after a 1/2 lb ai/A application based on Kenaga's formula would be as follows.

<u>Substrate</u>	<u>Residue (ppm)</u>
Shortgrass -	140
Long grass	55
Leaves & Leafy Crops	65
Forage	30
Seed Pods	6.5
Fruit	3.7

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The estimated runoff potential of a 0.5 lb ai/A application onto a 10 acre drainage basin draining into a 1 acre pond would range between 3 ppb for 1% runoff of active ingredient to 18 ppb for a 3% runoff.

Goal has low water solubility and high soil adsorption. The chemical is not considered volatile and will persist in aquatic habitats if inadvertently introduced into them. An Exposure Analysis monitoring system estimated halflife of oxyfluorfen to be 127.3 days in a small unstratified lake system with potential for bioaccumulation in benthic sediments (Hitch, 1980).

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

#### 101.3 Terrestrial Assessment

The estimated concentration levels of oxyfluorfen are well below mammalian LD<sub>50</sub> values of 5000 mg/kg and no adverse effect is expected from a pre-emergence application.

The LC<sub>50</sub> for mallard duck is >4000 ppm, but the LC<sub>50</sub> for bobwhite quail is considerably lower at 390 ppm. Avian reproduction was unaffected in both species at levels ≤100 ppm. The residue levels predicted for leafy crops and grasses range from 65 to 140 ppm. As the application is pre-emergent it is not expected that avian life will be adversely affected by exposure from ingestion of plant material.

#### 101.4 Aquatic Assessment

Oxyfluorfen has been shown to exhibit high toxicity toward aquatic organisms. As applications are in an area where estuarine systems are not present the major organisms of concern would be freshwater plant, invertebrate, and fish life. The estimated EEC levels that would accumulate in a 1 acre pond do not however reach 1/10 of the 1.5 ppm LC<sub>50</sub> for Daphnia magna. The LC<sub>50</sub> values for bluegill sunfish and rainbow trout are 0.200 ppm and 0.410 ppm respectively. Levels of concern are not expected to be reached for these species. In tests with fathead minnow juvenile fish were observed to evolve normally from hatch at concentrations >38 and <74 ppb. Again, these levels are not expected to be reached in the environment by the proposed application.

#### 101.5 Endangered Species

Listed species for the proposed counties include the Indiana bat, bald eagle, least tern, pallid sturgeon, and in St Clair County, the Decurrent False Aster.

The Indiana bat, bald eagle, and least tern are not expected to be affected.

Exposure through runoff into areas near the upper Mississippi river drainage may pose a potential threat to the pallid sturgeon through direct ingestion of benthic sediment, degradation of habitat, and possible effects to reproductive processes. A long half life and tendency toward bioaccumulation in bottom sediments present potential for oral ingestion due to the benthic feeding habits of this species. Precautions concerning application near watersheds leading to the habitat of this species should be considered.

The threat from application of any herbicide near habitat of an endangered plant must be considered seriously. The Decurrent False Aster is found in St Clair county (one of 12 Illinois populations) along The Mississippi River watershed. Application near critical habitat of this species should be strictly regulated.

It is recommended that potential applicators contact the nearest office of The U.S. Fish and Wildlife Service concerning the locations of critical habitat for both the Decurrent False Aster and the Pallid Sturgeon before application of Goal 1.6 EC in these counties.

#### **101.6 Adequacy of Labeling**

The precautions which prohibit application near any body of water or wetlands are adequate for protection of nontarget organisms.

Additional precautions concerning the endangered species mentioned above should be included for this requested special use.

**103.0 Conclusions:** Minimal hazard to nontarget mammalian, avian, and non-endangered fish or invertebrates, is expected from the proposed single application. Potential for exposure of the Decurrent False Aster to toxic levels may be reduced by adequate preventative measures in St. Clair county. Application near drainage basins leading to critical habitat of the pallid sturgeon in all three counties must be considered and consultation with the area Endangered Species Office of the U.S. Fish and Wildlife Service is recommended.

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Reviewed by: Brian Montague, Fisheries Biologist  
Ecological Effects Branch  
Environmental Fate and Effects Division

*Brian Montague*

Approved by: Ray Matheny, Supervisory Biologist  
Ecological Effects Branch, Section I  
Environmental Fate and Effects Division

*Ray Matheny 3/28/90*

Approved by: James Akerman, Chief  
Ecological Effects Branch  
Environmental Fate and Effects Division (H7507C)

*James Akerman 3/29/90*