121001
SHAUGHNESSEY NO.

8
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 6-6-83 OUT 6-8-83

FILE OR REG. NO. 83-ID-02, 83-ID-03, 83-ID-04

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 4-29-83

DATE RECEIVED BY HED 6-3-83

RD REQUESTED COMPLETION DATE 6-20-83

EEB ESTIMATED COMPLETION DATE 6-19-83

RD ACTION CODE/TYPE OF REVIEW 511/Section 18

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. D. Stubbs (41)

PRODUCT NAME(S) Poast

COMPANY NAME Iowa Dept. of Agriculture

SUBMISSION PURPOSE Proposed Section 18's for use on carrots, onions, and potatoes

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
121001	2[1-ethoxyimino)butyl]-5-[2-(ethylthio)	
	propyl]-3-hydroxy-2-cyclohexene-1-one	20

100.0 Proposal

Sec. 18 - Emergency Exemption - Iowa requesting a Sec 18 label for "Poast" Herbicide on carrots, onions, and potatoes.

100.1 Pesticidal Use

For control of grassy weeds including giant foxtail (Setaria faberii), green foxtail (Setaria viridis), yellow foxtail (Setaria lutescens), bromegrass (Bromus tectorum) and quackgrass (Agropyron repens) in carrots, onions and potatoes.

100.2 Application Methods, Directions, Rates

Carrots - 1 pt./A or 0.2 lb a.i./A, postemergence, principally by ground sprayer; in 20-40 gallons water/A; all growers using Poast will be under the direct supervision of a certified applicator.

Onions - 0.25 lb. ai/A, postemergence, principally by ground sprayer; in 20-40 gallons water/A; all growers using Poast will be under the direct supervision of a certified applicator.

Potatoes 0.2 lb ai/A postemergence; largely by air in a spray mixture of 5-10 gallons/A water; ground applications will include 20-40 gal. per acre; all growers using Poast will be under direct supervision of a certified applicator.

100.3 Nature of the Emergency

Vegetable growers have had crop losses this spring (1983) due to cold and wet weather conditions. Carrot, onion and potato growers in Iowa have experienced grass infestations due to excessive rainfall during previous growing seasons, and the 1983 growing season to date has proven to be in excess of normal rainfall, which favors grassy weed infestations.

There are about 1000 acres of carrots, 200 acres of onions and 1500-2000 acres of potatoes to be treated in Iowa.

In order to get maximum grass control in these crops, a postemergence herbicide is needed to control grassy weeds escaping premergence herbicides. According to Iowa's application there are no postemergence grass herbicides currently registered in Iowa for these crops. Currently labeled postemergence grass control herbicides are not compatible with Iowa peat, muck or sandy soils in which most of these vegetables are grown, and these are not labeled for late season applications.

100.4 Target Organisms

Annual and perennial grass weeds (see list appended).

100.5 Precautionary Labeling

The following environmental hazards labeling appears on the submitted label:

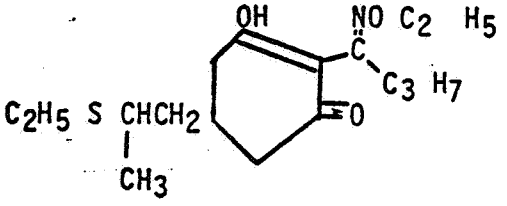
"Do not apply directly to lakes, ponds, or streams. Do not contaminate water by cleaning of equipment or disposal of wastes."

101 Physical and Chemical Properties

101.1 Chemical Name

2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one

101.2 Structural Formula



101.3 Common Name

[redacted]

101.4 Trade Name

Poast

101.5 Molecular Weight

240.3

101.6 Physical State

White solid

101.7 Solubility

Water	0.05
Acetone	150.7
Ethanol	86.1
Olive oil	2.7

102 Behavior in the Environment (from EFB review 7/22/82; C. Fletcher)

102.1 Soil

Poast will photodegrade on soil surfaces, with a half-life of approximately 3.6-3.7 hours.

Poast degrades in loamy sand soil under aerobic, sterile/aerobic and anaerobic conditions. Microbial activity is primarily responsible for its disappearance. Half-life in loamy sand was determined to be 4-5 days and in loam about 11 days.

Laboratory soil leaching data shows that aged Poast residues could leach in soils. This is supported by the low soil adsorption coefficient (K = 0.3039 and 0.740 for soil with 0.69% and 2.44% organic matter, respectively). However, in a field leaching/dissipation study, Poast did not leach beyond the first 4 inches of soil and did not persist.

102.2 Water

Poast is fairly stable to hydrolysis with a half-life of about 40 days at pH 6 and 25°C. The major hydrolysis metabolite is M2S, an oxazole derivative.

Photolytic half-lives of Poast were about 23 and 38 minutes under anaerobic and aerobic aqueous solutions. M2S is the major hydrolysis product.

102.3 Plant

Poast does not accumulate in rotational crop tissues. Measured residues were all below 0.066 ppm.

102.4 Animal

Fish accumulation data for bluegill and channel catfish indicate they will not accumulate residues of [redacted] Poast M2S when exposed to [redacted] Poast residues in water, maximum concentration for bluegill whole fish was about 7X the water concentration at day 14. After 14 days depuration, over 90% of the maximum accumulated residues were eliminated. Accumulation levels in catfish are not expected to exceed 1X.

103 Toxicological Properties

103.1 References from Toxicology Branch

Species	Test	Results
Rat	A.O. LD_{50}	2676-3125 mg/kg
Mouse	A.O. LD_{50}	5600-6500 mg/kg
Rabbit	A.O. LD_{50}	4600 mg/kg

103.2 Minimum Requirements

103.2.1 Avian Acute Oral LD_{50}

Species	Test	Result	Category
Mallard duck	Acute oral LD_{50}	>2,000 mg/kg	Core

103.2.2 Avian Dietary LC_{50}s

Species	Test	Result	Category
Mallard duck	8-day dietary LC_{50}	>5000 ppm	Core
Bobwhite quail	8-day dietary LC_{50}	>5000 ppm	Core

103.2.3 Fish Acute LC_{50}s

Species	Test	Result	Category
Bluegill sunfish	96-hr LC_{50}	265 ppm	Core
Rainbow trout	96-hr LC_{50}	170 ppm	Core

103.2.4 Aquatic Invertebrate LC_{50}

Species	Test	Result	Category
Daphnia magna	48-hr LC_{50}	78.1 ppm	Core

104 Hazard Assessment

104.1 Discussion

The request is for Poast to be exempted for application to vegetables at rates up to 1.25 pints/A to control a variety of annual and perennial weeds. These rates are equivalent to 0.25 lb. a.i./A.

104.2 Likelihood of Adverse Effects to Non-Target Organisms

Applications at recommended label rates will result in the following maximum residues on plants and invertebrate fauna:

Vegetation/Animal	Residues (ppm) from application of: 0.2 lb/A	0.5 lb/A
Short rangegrass	48	120
long grass	22	55
leaves and leafy crops	25	63
forage/small insects	11.5	29
legumes/large insects	2.4	6.0
fruit	1.4	3.5

These residue levels are well below the reported acute oral and dietary toxicity values for birds (>2000 mg/kg and >5,000 ppm, respectively) and mammals (>2000 mg/kg). No significant acute mortality of terrestrial species is expected from the proposed use of Poast.

A direct application of 0.5 lb a.i./A to a body of water 6 inches deep would result in residues (367 ppb) approximately 87 X lower than the no effect level for the most sensitive aquatic species tested (Daphnia magna, NOEL = 32 ppm). Direct application to water is not anticipated, as per label instructions, so exposure to aquatic species should only result from leaching or runoff. No significant acute mortality of aquatic species is expected from the proposed use.

Given the properties of Poast, no unreasonable acute or chronic impact on terrestrial or aquatic organisms is expected. As pointed out in a previous EEB review (Stevens 7/30/82), although fairly stable to hydrolysis (T 1/2 = 40 days) bentazon photodegrades fairly rapidly in soil and water (T 1/2 < 1 day). According to the Environmental Fate Branch, leaching is not indicated under natural conditions.

104.3 Endangered Species Considerations

Given the low application rates and the fact that Poast-B is not expected to persist in the environment, no endangered species are likely to be jeopardized by the proposed registration.

107 Conclusions

Based upon the available data EEB concludes that the proposed use provides for no significant increase in exposure or risks to nontarget organisms.

107.1 Environmental Hazards Labeling

The environmental Hazards labeling should be modified to read as follows:

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

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RECOMMENDATIONS FOR GRASS CONTROL

STATES OTHER THAN CALIFORNIA, ARIZONA, NEW MEXICO, AND WESTERN TEXAS

- Apply to actively growing grasses.
- Follow water volume and spray pressure recommendations to insure thorough spray coverage.
- Apply to grasses no larger than the size indicated below.
- ALWAYS ADD OIL CONCENTRATE ACCORDING TO LABEL RECOMMENDATIONS.

ANNUAL GRASSES

For broad spectrum control of annual grasses in Group A below, use 1 pint of Poast per acre.
When weed populations include additional grasses in Groups B and/or C, increase the rate of Poast as indicated below.
If subsequent flushes of annual grasses emerge after the first application, make additional applications at the same rate.

Group	Grass Species	Maximum Height	Poast Rate Per Acre	Oil Concentrate Rate Per Acre	
				Ground	Air
A	Barnyardgrass *(Echinochloa crus-galli)* Broadleaf Signalgrass *(Bachiaria platyphylla)* Fall Panicum *(Panicum dichotomiflorum)* Foxtails Giant *(Setaria faberi)* Green *(Setaria viridis)* Yellow *(Setaria lutescens)* Goosegrass *(Eleusine indica)* Johnsongrass, Seedling *(Sorghum halepense)* Junglerice *(Echinochloa colonum)* Large Crabgrass *(Digitaria sanguinalis)* Smooth Crabgrass *(Digitaria ischaemum)* Sprangletop *(Leptochloa filiformis)* Texas Panicum *(Panicum texanum)*	up to 6"	1 pt.	2 pts.	1 pt.
B	Volunteer Barley *(Hordeum vulgare)* Oats *(Avena sativa)* Rye *(Secale cereale)* Wheat *(Triticum aestivum)*	up to 8"	1 1/2 pts.	2 pts.	1 pt.
C	Red Rice *(Oryza sativa)*	up to 4"	2 pts.	2 pts.	1 pt

PERENNIAL GRASSES

Grass Species	APPLICATION TIME	Poast Rate Per Acre	Oil Concentrate Rate Per Acre	
			Ground	Air
Bermudagrass *(Cynodon dactylon)* • First Application	Before plant diameter exceeds 6" or leaf height exceeds 1".	2 1/2 pts.	2 pts.	1 pt.
• Second Application	1-4" length of regrowth or new plants.	1 1/2 pts.	2 pts	1 pt.
Johnsongrass, rhizome *(Sorghum halepense)* • First Application	15-18" height	1 1/2 pts.	2 pts.	1 pt.
• Second Application	6-12" height of regrowth or new plants	1 pt.	2 pts.	1 pt.

RECOMMENDATIONS FOR GRASS CONTROL

CALIFORNIA, ARIZONA, NEW MEXICO AND WESTERN TEXAS

- Apply to actively growing grasses.
- Follow water volume and spray pressure recommendations to insure thorough spray coverage.
- Apply to grasses no larger than the size indicated below.
- ALWAYS ADD OIL CONCENTRATE ACCORDING TO LABEL RECOMMENDATIONS.

ANNUAL GRASSES

For broad spectrum control of annual grasses below, use 1½ pints of Poast per acre. If subsequent flushes of annual grasses emerge after the first application, make additional applications at the same rate.

Grass Species	Maximum Height	Poast Rate Per Acre	Oil Concentrate Rate Per Acre	
			Ground	Air
Barnyardgrass *(Echinochloa crus-galli)* Broadleaf Signalgrass *(Bachiaria platyphylla)* Fall Panicum *(Panicum dichotomiflorum)* Foxtails Giant *(Setaria faberi)* Green *(Setaria viridis)* Yellow *(Setaria lutescens)* Goosegrass *(Eleusine indica)* Johnsongrass, Seedling *(Sorghum halepense)* Junglerice *(Echinochloa colonum)* Large Crabgrass *(Digitaria sanguinalis)* Smooth Crabgrass *(Digitaria ischaemum)* Sprangletop *(Leptochloa filiformis)* Texas Panicum *(Panicum texanum)*	up to 6"	1½ pts.	2 pts.	1 pt.
Volunteer Barley *(Hordeum vulgare)* Oats *(Avena sativa)* Rye *(Secale cereale)* Wheat *(Triticum aestivum)*	up to 8"			

PERENNIAL GRASSES

Grass Species	Application Time	Poast Rate Per Acre	Oil Concentrate Rate Per Acre	
			Ground	Air
Bermudagrass *(Cynodon dactylon)* • First Application	Before plant diameter exceeds 6" or leaf height exceeds 1".	2 1/2 pts.	2 pts.	1 pt.
• Subsequent Applications (maximum of two)	1-4" length of regrowth or new plants	1 1/2 pts.	2 pts	1 pt.
Johnsongrass, rhizome *(Sorghum halepense)* • First Application	6-10" height	2 1/2 pts.	2 pts.	1 pt.
• Subsequent Applications (maximum of two)	6-8" height of regrowth or new plants.	1 1/2 pts.	2 pts.	1 pt.