EEB BRANCH REVIEW

4/12/1979

DATE: IN 1/15/79 OUT 2/23/79 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 707-RUL - /

PETITION OR EXP. PERMIT NO. 9F2197

DATE DIV. RECEIVED 5/5/78

DATE OF SUBMISSION 5/5/78

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

DATA ACCESSION NO(S). 234028, 096881

PRODUCT MGR. NO. 25

PRODUCT NAME(S) Goal^{R} 2F Herbicide

COMPANY NAME Rohm and Haas

SUBMISSION PURPOSE New application use in peaches, nectarines, plums, prunes, almonds-in-California

CHEMICAL & FORMULATION 2-Chloro-1-(3-ethoxy-4-nitrophenoxy-4-trifluromethyl)benzene

(1)

100 Pesticide Label Information

100.1 Pesticide Use

Preemergence and postemergence broadleaf weed control in nonbearing almonds, nectarines, peaches, plums and prunes grown in California only.

100.2 Formulation Information

Goal 2E is an emulsifiable concentrate containing 2.0 lbs ai/per gallon of product. The percent active 23.5 percent.

100.3 Application Methods/Directions/Rates/Weeds

Do not apply to base of trees that will bear fruit within one year of treatment. Goal 2E should be applied as a ground spray directed at the base of crop plants.

Early postemergence (weeds up to 3 in.)	(x) 1.0 lb/a	Filaree, malva, remaids
Postemergence (weeds up to 6 in.)	(x) 2.0 lb/A	Filaree, malva, sheperdspurse, fiddleneck, nettle
Preemergence (soil surface should be smooth and free of trash)	(x) 2.0 lb/A	Filaree, malva, sheperdspurse, Lambsquarters, pigweed, London rocket

(x) Reduce rates proportionately for band or strip treatment.

Herbicide tanks mix conditions

Improved postemergence control (especially where annual grasses are emerged). Use Goal at 1.0 - 2.0 lbs with Paraquat

Residual grass control

Use Goal at 1.0 - 2.0 lbs with Surflan 75W at 5 1/3 lbs/ A plus Paraquat.

100.5 Precautionary Labeling

Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes.

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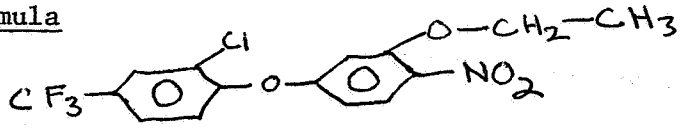
Toxic to fish. Do not apply when weather conditions favor runoff or drift from areas treated. Apply this product only as specified on the label.

101 Physical and Chemical Properties

101.1 Chemical Name

2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluromethyl) benzene

101.2 Structural Formula



101.6 Solubility

Less than 0.1 ppm in water at 25°C; soluble in most organic solvents.

102 Behavior in the Environment

The following statements are abstracted from R. Hitch's review 2/7/79:

> Goal can be expected to: (1) persist in fields with a half-life of approximately 60 days (2) runoff in fields (should soil erosion occur (3) bioaccumulate in fish over 300x.

Photolysis would seem to be the major mode of degradation rather than hydrolysis or soil microbe metabolism.

102.4 Animal

In rats 99.5 percent of the applied 14_C was found in the feces; some 72 percent was found as RH-2915. In goats most of the applied radioactivity was recovered in feces, but residues did not accumulate in milk.

102.3 Plant

Less than 1% of the material was translocated after foliar application.

103 Toxicological Properties

The following data was copied from toxicology Branch reviews:

Species	Route	Result
Rat (male)	Oral, 68% A.I.	LD50 > 7.07 g/kg
Rat (male)	Oral, 85% A.I.	LD50 = 5.47 g/kg
Rat (male)	Oral, 98% A.I.	LD50 > 5.0 g/kg
Dogs (female)	Oral, 91% A.I.	LD50 > 5.0 g/kg
Rat	Oral, NF	LD50 = 3.51 g/kg
Rat	Oral, OF	LD50 = 5.05 g/kg
Rabbit (male)	24 hr. Dermal, 68%, A.I.	LD50 > 5.0 g/kg
Rabbit (male)	24 hr. Dermal, 85%, A.I.	LD50 > 5.0 g/kg
Rabbit (male)	24 hr. Dermal, NF	LD50 > 5.0 g/kg
Rabbit (male)	24 hr. Dermal, OF	LD50 > 3.0 g/kg
Rabbit (male)	1 hr. Inhalation, OF	LD50 > 213 mg/L

Rat cytogentic - negative
Host-Mediated Assay - negative
Ames Assay - negative
Rat Teratology - fetotoxic NOEL - 100 mg/kg; no terata at 1000 mg/kg (highest dose).
3-Genration Rat Reproduction: NOEL = 100 ppm
24 Month Rat Chronic Toxicity/Oncogenicity:
NOEL = 40 ppm
20 Month Mouse Chronic Toxicity Oncogenicity
NOEL = 2 ppm
90-Day Rat Feeding Study: NOEL = 100 ppm
90-Day Dog Fedding Study: NOEL = 400 ppm

103 Minimum Requirements (Current Core studies)

Study	LD/LC50	
96-hour rainbow trout	0.410 ppm	
96-hour bluegill sunfish	0.200 ppm	
8-day dietary Bobwhite quail	340 ppm	(reported value)
8-day dietary mallard duck	4000 ppm	
96-hour channel catfish	0.4 ppm	
48-hour daphnia	1.47 ppm	
Acute oral Bobwhite quail	(a)5055 mg/kg or 5600 mg/kg	(estimated)

(a) value calculated by Ecological Effects Branch

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Hazard Assessment

Immediately upon application, the residue profile on weed species will be:

Goal Residues (ppm)

lbs/A	Shortgrass	Dense Foliage	longgrass	Seed heads
1.0	240	58	110	19
2.0	480	116	220	38

Several of the target species are utilized as food by nontarget birds and mammals.

Redmaids

Mourning doves (seeds)
Horned lark (seeds)
American pipit (seeds)
California ground squirrel (seeds and plants)
California rock squirrel (seeds and plants)

Filarees

California quail (seeds and plant) Valley quail (seeds and plant)
Common house finch (seeds)
Nelson ground squirrel (seeds)
Giant Kangaroo rat (seeds)
Black-tailed Deer (plants)
Mule deer (plants)

Only the postemergence applications would result in exposure to wildlife. These plants are approximately 1 foot when mature, therefore it is unlikely that seed heads would be formed at the time of treatment. Other than mammals only a few avian species would utilize the foliage. The two pound rate triggers a restricted classification for birds when estimating residues on target vegetation (foliage) (116 ppm = 0.29 x of 390 ppm).

This reviewer believes there would be only a limited exposure due to (1) in the row treatment (2) a single application (3) short period for vegetation to be attractive after spraying. Therefore, there will not be a signigicant hazard to avian species. (See telephone memo.) Non-target grass species

S

may be browned over due to frost, therefore would not be attractive food. Goal is toxic to fish and considered persistent, however, the method and location of application (within rows) should not result in aquatic contamination. Contamination my occur in those instances where transplants were being placed in a newly cultivated orchard and runoff could occur.

104.3 Endangered Species Considerations

With the possible exception of the Bald Eagle, none of the endangered avian species would be expected in orchards. The Bald Eagle may acquire residues should it feed on small mammals that have grazed on contaminated foliage. However, the mammals should not be effected and therefore, should not be weakened; they will be no more susceptible to eagles than uncontaminated. Lastly mammals excrete Goal rapidly; consequently only low residues would be present.

104.4.5 See Conclusions

105 Classification

This use pattern can be recommended for general classification for two reasons inspite of the subacute toxicity to avian species criteria triggering the restricted category (see classification calculations). Number one, specialized equipment is not required to apply this chemical. Secondly, (according to label directions) only 0.002 - 20.0 percentage of an acre will be contaminated for a short duration.

106 RPAR Criteria

An acute trigger on birds is exceeded at the 2 lb rate in that residues on short grass will be greater than the LC50 to Bobwhite quail. Several considerations may enable the transferred from RPAR to general:

1. Although residues immediately upon application may equal the LC50 to Bobwhite quail, photo degradation will reduce the residues to below the LC50.

2. Goal and Paraquat will brown up the vegetation within a few days - thereby reducing its attractiveness as a food source.

3. Birds fed up to 100 ppm for 18 weeks in a reproduction study, showed no signs of stress.

4. Grasses (the vegetation with the highest residue) may comprise up to 40% of the vegetation around the trees. The grass would be interspersed with broadleafs, therefore would be shielded from some spray and would not be the only source of food.

5. Depending upon the orchardist only 0.002% - 20% (or almonds) of an acre will be treated.

107 Conclusions

107.1 Environmental Fate and Toxicity

Recent reviews by R. Hitch 2/79 including comments from Environmental Fate and H. Spencer of Toxicology 1/16/79 were included in this review.

107.3 Environmental Hazards Labeling

The following label comments would be appropriate for a label:

> "This pesticide is toxic to wildlife and fish. Use with care when applying areas frequented by wildlife or adjacent to any body of water. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes."

Since the label bears a reference to mixing with other products, add a statement such as the following:

> "Observe all cautions and limitations on labeling of all products used in mixtures."

107.4 Data Adequacy Conclusions

All of the six basic studies submitted by Rohm and Haas - (1) Bobwhite quail a.c. (2) Mallard duck and Bobwhite quail subacute dietary (3) Bluegill, Channel catfish and Rainbow trout subacute 96-hr LC50 and (4) Daphnia acute 48 hr LC50 are acceptable for registration requirements.

107.5 Data Request

107.7 Recommendations

Based upon the acute and subacute data reviewed for this submission, Goal 2E is moderately toxic to birds and highly toxic to fish. Little or no exposure to the aquatic environment is expected from this use pattern. Avian species would be exposed to lethal residues immediately upon application in a limited portion of treated orchards.

Henry T. Craven
Henry T. Craven 3/23/79
Ecological Effects Branch

Ed Fite NCook 4-2-79
Acting Section Head, Section #2
Ecological Effects Branch

Clayton Bushong
Branch Chief
Ecological Effects Branch
Hazard Evaluation Division

Rat >5.0 g/Kg
Bird 390 ppm
Fish 0.2 ppm

APPLICATION RATE (LBS/A a.i.)

	MAMMAL			AVIAN			AQUATIC	
FEED/WATER	General	Restricted	RPAR	General	Restricted	RPAR	General	Restricted
Foliar Application								
Forage				< 1.65	> 1.65	6.8		
Leafy Crop								
Grass - Long				< 0.9	> 0.9	3.6		
Grass - Short				< 0.41	> 0.41	1.6		
Ornamentals								
Trees								
Fruit, Seeds, Insects				< 4.95	> 4.95	58.00		
Soil Application								
No Incorporation								
Granular (mg/ft^2)								
Other (1")								
Incorporation								
1"								
2"								
3"								
>3"								
Aquatic Application								

ERS	ORGANISM	GENERAL	RESTRICTED	REBUTTABL PRESUMPTI
A	MAMMAL	$<1/5\ LD_{50}$	$\geq 1/5\ LD_{50}$ to $< LD_{50}$	$\geq LD_{50}$
	rat ♂	>1000 mg	>1000 mg >5000 mg	>5000 mg
	dog :♀	>1000 mg	>1000 mg >5000 mg	>5000 mg
	AVIAN	$< 1/5\ LC_{50}$	$\geq 1/5\ LC_{50}$ to $< LC_{50}$	$\geq LC_{50}$
B	mallard	<800	>800 to 4000	≥4000
	bobwhite	<~~78~~	>~~78~~ to	≥390
	AQUATIC*	$<1/10\ LC_{50}$	$\geq 1/10\ LC_{50}$ to $1/2\ LC_{50}$	$>1/2\ LC$
C	_____:			
	_____:			
D	The pesticide causes, under conditions of label use, or widespread and commonly recognized practice of use, only minor and no discernible adverse effects on the physiology, growth, population levels, or reproduction rates of non-target organisms, resulting from exposure to the product ingredients, their metabolites or degradation products, whether due to direct application or otherwise resulting from application such as through volatilization, drift, leaching or lateral movement in soil.		The pesticide causes, under conditions of label use, or widespread and commonly recognized practice of use, discernible adverse effects on the physiology growth, population levels, or reproduction rates of non-target organisms, resulting from exposure to the product ingredients, their metabolites, or degradation products, whether due to direct application or otherwise resulting from application, such as through volatilization, drift, leaching or lateral movement in soil.	Chronic Toxic Can reasonabl anticipated t result in sig ficant local, gional, or na population re tions in non- organisms, or fatality to m of endangered cies.

*used only in cases where "direct application" to water is intended. (See W. Preston Memo of January 14, 1976.)

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REPORT OF TELEPHONE CALL OR VISITOR

NOTE: Complete this form. Write "NA" where not applicable.

	INCOMING CALL		VISITOR
X	OUTGOING CALL		CONGRESSIONAL

DATE: 2/29/79

TIME OF CALL: 11:10 A.M.

NAME AND ADDRESS OF CALLER OR VISITOR

Dr. Clyde Elmore
Weed Specialist
University of California

PHONE NO. (Include Area Code or IDS No.): 916-752-0612

REGISTRATION, ID NO. OR FILE SYMBOL: 707-145

DATE OF LATEST SUBMISSION: 4/5/78

BRIEF SUMMARY OF CONVERSATION

Dr. Elmore was called to learn more about weed control programs in almonds (primarily), peaches, nectarines, plums and prunes.

During the winter when Goal 2E will be applied grass species will have browned over due to the first frost. Consequently although grass would comprise 40% of the vegetation it would not be utilized by birds at this time. After seven days the Goal 2E would have ellicted a phytoxic response from the grasses.

ACTION TAKEN OR RECOMMENDED

Malva is the principle target weed specie. Most of the vegetation will be around six to 10 inches. Depending upon the orchardist, Goal 2E will be utilized on 0.002 - 20% of an acre. The latter percentage applies only to almonds.

Presently the use pattern does not include nurseries. Although initial tests demonstrate Goal 2E to be safe to trees less than 2 years the hazard from 2.0 lbs. ai/has not been satisfactorily ~~proven~~. explored

After treatment target plants should show phytoxic response within 2-3 days. Even the grasses show some phytoxicity after 7 days.

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RECORDED BY (Name): H.T. Craven

REFERRED TO (Name):

EPA Hq Form 8500-5 (8-72) REPLACES PR FORM 1-5 WHICH MAY BE USED UNTIL EXHAUSTED.