

US EPA ARCHIVE DOCUMENT

111601

2-7-79

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SEE BRAYER REVIEW

DATE: IN <u>3/17/78</u> OUT <u>2/7/79</u>	IN _____ OUT _____	IN _____ OUT _____
FISH & WILDLIFE	ENVIRONMENTAL CHEMISTRY	EFFICACY

FILE OR REG. NO. 707-RUE -142

PETITION OR EMP. PERMIT NO. 8F2058

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

DATA ACCESSION NO(S) _____

PRODUCT MGR. NO. Mountfort

PRODUCT NAME(S) Goal 2E herbicide

COMPANY NAME Rohm & Haas

SUBMISSION PURPOSE Registration for use on soybeans and corn

CHEMICAL & FORMULATION 2-chloro- (3-ethoxy - 4 - nitrophenoxy) - 4
(trifluoromethyl) benzene 23.590

①

100. Pesticide Use

Preemergence control of certain annual grass and broadleaf weeds in soybeans. Also, control of witchweed in corn.

100.1 Application Method / Directions

For Corn

GENERAL INFORMATION: GOAL 2E is a selective herbicide for the control of Witchweed (Striga asiatica) in corn. Initial spray treatments should be made in a directed application to the soil surface at the base of the corn plant prior to the witchweed emergence. GOAL kills witchweed plants as the shoots come in contact with the herbicide during emergence. GOAL will also kill emerged witchweed when applied postemergence onto them. A follow-up spray treatment should be made if witchweed emergence is noted and adequate kill has not been obtained. A second treatment might be required where inadequate surface soil moisture persists following the application or during the period of peak witchweed emergence.

RECOMMENDED DOSAGES: Apply 1.5 to 4 quarts of GOAL herbicide (0.75 to 2 pounds active ingredient per acre) in 10 to 30 gallons of water. If a second application is needed or considered then make certain that the total active ingredient from the two applications does not exceed 2 pounds or 1 gallon of GOAL product per acre. A typical spray program would be 1.5 to 2 quarts of GOAL per acre followed by 1 to 2 quarts of GOAL should witchweed breakthrough occur. Use TRITON CS-7, spreader-binder, in the spray mixture at the rate of 0.25% by water volume or 1 quart TRITON CS-7 in 100 gallons of spray mixture.

Do not apply more than 1 gallon of GOAL product (2 pounds active) to a corn crop during the growing season.

APPLICATION TIMING: Fields in the witchweed infested area selected for treatment with GOAL herbicide should be examined during the early part of the growing season to determine uniformity of corn stand and grass weed pressure. Weedy fields should be cultivated prior to the initial application of GOAL so as to obtain the best possible soil coverage in the first spray application. This spray application should be made prior to the initial emergence of the witchweed. Corn should have a minimum height of 24 inches at the first application. After making this application the fields should be inspected regularly for any breakthrough of the witchweed. If breakthrough occurs then a second spray should be applied like the first. This application will be made postemergence to the witchweed preferably before bloom or as soon as possible past the first appearance of witchweed bloom, to avoid seed set.

In all applications direct the GOAL spray at the base of the corn plant and uniformly over the entire row surface. Do not spray GOAL over the top of corn as this may result in severe corn injury. Spray droplets contacting the lower leaves will cause necrotic spotting or streaking of sprayed tissue. Spray should contact only the lower 3 to 8 inches of the corn stalk and any leaves in this zone.

DO NOT USE TREATED PLANTS FOR GREEN CHOP FORAGE OR SILAGE.

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label when used in accordance with directions

under normal conditions of use, but neither this warranty nor any other warranty of merchantability or fitness for a particular purpose, express or implied, extends to the use, storage or handling of this product contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. These risks include, but are not limited to damage to plants, crops and animals to which the material is applied, failure to control pests, damage caused by drift to other plants or crops, and personal injury.

For Soybeans

GENERAL INFORMATION: GOAL 2E is a selective herbicide the preemergence control of certain annual grass and broad-leaf weeds in soybeans in a preemergence application. A preemergence application should be made on the soil surface no later than one day after planting the soybeans. GOAL kills seedling weeds as they come in contact with the herbicide during emergence. For use directions covering post-directed sprays in soybeans, see information at end of label.

DO NOT USE TREATED PLANTS FOR FEED OR FORAGE.

Soybeans are tolerant to recommended dosages of GOAL; however, under certain conditions, GOAL can cause temporary injury. Heavy splashing rain shortly after crop emergence or cold, wet soil conditions during early growth stages can produce leaf cupping and crinkling. When injury occurs, it is generally limited to the first few leaves that develop shortly after crop plants emerge from the soil. Soybeans recover from this injury and yields are not adversely affected.

APPLICATION, MIXING, AND EQUIPMENT: Make a single application of GOAL on the soil surface not later than one day after soybean planting. For best results, a uniform application should be made to well prepared, smooth seedbed free of large soil clods. GOAL should be thoroughly-mixed with clean water at recommended concentration and applied in a minimum of 20 gallons of water per treated acre. Use conventional spray equipment with fan-type or flood jet nozzels. Accurately calibrate spray equipment prior to each use. Avoid drift to all other crops and non-target areas. Thoroughly flush spray tanks with water before and after each use.

WEEDS CONTROLLED: GOAL 2E used alone at recommended dosages.

Groundcherry	Physalis spp.
Jimsonweed	Datura stramonium
Lambsquarters	Chenopodium album
Pigweed, redroot	Amaranthus retroflexus
Prickly sida (Teaweed)	Sida spinosa
Ragweed, common	Ambrosia artemisiifolia
Smartweed	Polygonum pensylvanicum
Velvetleaf	Abutilon theophrasti
Barnyardgrass	Echinochloa crus-galli
Crabgrass	Digitaria sanguinalis
Fall panicum	Panicum dichotomiflorum
Foxtail, giant	Setaria faberi

Under certain conditions, GOAL may give sufficient benefit (suppression) to be of value against the following weeds:

Cocklebur, common	Xanthium pensylvanicum
Morningglory species	Ipomoea spp.
Johnsongrass, seedling	Sorghum halepense
Signalgrass	Brachiaria platyphylla
Foxtail, yellow	Setaria lutescens

WEEDS CONTROLLED: GOAL preemergence to soybeans following a TREFLAN^R preplant incorporated treatment.

When TREFLAN is used preplant incorporated and followed by GOAL in a preemergence application, in addition to the broadleaves controlled, increased grassy weed control of the following is obtained.

Barnyardgrass	Echinochloa crus-galli
Crabgrass	Digitaria sanguinalis,
Foxtail, giant	Setaria faberi
Foxtail, yellow	Setaria lutescens
Foxtail, species	Setaria spp.

WEEDS CONTROLLED: Tank mixture GOAL 2E + LASSO^R 4E
The use of GOAL preemergence in a tank mixture with LASSO herbicide gives broadleaf control plus improved grassy weed control over GOAL alone on the following:

Barnyardgrass	Echinochloa crus-galli
Crabgrass	Digitaria sanguinalis
Fall panicum	Panicum dichotomiflorum
Foxtail species	Setaria spp.
Foxtail, yellow	Setaria lutescens
Johnsongrass, seedling	Sorghum halepense
Signalgrass	Bracharia platyphylla

CONVENTIONALLY TILLED SOYBEANS—

RECOMMENDED DOSAGES

PREEMERGENCE

GOAL is recommended for preemergence broadcast or banded applications to conventionally planted soybeans. GOAL is recommended for broadleaf and grass control at 1.0 to 1.5 pints (0.25 to 0.375 lb. active) per acre. Use the high rate where a heavy grass population is expected or where weeds claimed as suppressed are present. GOAL is not recommended for use on muck or peat soils. GOAL can be

used alone in a preemergence application where grassy weeds are not a serious problem or preemergence over a TREFLAN preplant incorporated treatment, or as a tank mixture in a preemergence application with LASSO herbicide. See charts below for dosage rates.

GOAL PREEMERGENCE TO SOYBEANS FOLLOWING A TREFLAN PREPLANT INCORPORATED TREATMENT

BROADCAST RATE

PER ACRE

GOAL FOLLOWING TREFLAN

Soil Texture	TREFLAN Rate in Pints Soil Organic Content			
	GOAL 2E pints*	0-1.9%	2-5%	5-10%
Coarse	1.0-1.5	1.0	1.5	2.0-2.5**
Medium	1.0-1.5	1.5	1.5	2.0-2.5
Fine	1.0-1.5	2.0	2.0	2.0-2.5
Muck or Peat	Do not use			

Label cautions for TREFLAN use should be strictly followed.

*Use highest rate where heavy grass infestation is expected.

**Refer to TREFLAN manufacturer's label for specific details such as planting depth, gallonage of water, incorporation information and control of problem weeds such as fall panicum, rhizome johnsongrass and wild cane.

GOAL/LASSO PREEMERGENCE TO SOYBEANS

BROADCAST RATE

PER ACRE	GOAL TANK-MIX LASSO		
	0 to 8% Soil Organic Content	Less than 3% Soil Organic Content	More than 3% Soil Organic Content
Soil Texture	GOAL 2E pints	LASSO pints	LASSO pints
Coarse	1.0-1.5	3.0	3.0
Medium	1.0-1.5	3.0	4.0
Fine	1.0-1.5	4.0	5.0
Muck or Peat	Do not use		

Label cautions for LASSO use should be strictly followed.

NO-TILL (DOUBLE CROP) - RECOMMENDED DOSAGES

PREEMERGENCE

Fields known to have troublesome perennial weeds such as johnsongrass or bermudagrass should not be selected for planting in no-tillage soybeans. In fields employing these systems, where GOAL is recommended as part of the system, it should be tank-mixed with paraquat herbicide. Use 1 quart of GOAL product (0.5 lb. active) plus 1 pint of paraquat (0.25 lb. active) per acre in 20 to 60 gallons of water. This mixture will give broadleaf weed control. Where annual grasses or volunteer grain are known to be a serious problem, a tank mixture of 3 components — GOAL, 1.0 pint (0.25 lb. active); paraquat, 1.0 pint (0.25 lb. active); plus LASSO, 2 quarts (2.0 lb. active) should be applied in 20 to 60 gallons of water per acre as a preemergence treatment. The order of mixing or adding GOAL/paraquat/LASSO to the spray tank is not important; however, the herbicides should be added to a spray tank partially filled with water, with the agitators or bypass system in operation.

A nonionic surfactant such as TRITON^R AG-98 is suggested in all tank mixtures containing paraquat herbicide. Follow the paraquat label directions for the proper use rate of the nonionic surfactant.

POST-DIRECTED SPRAYS: GOAL can be used successfully in a post-directed application for control of cocklebur, prickly sida, and annual morningglory in soybeans. Weeds to be treated must be emerging and young, not exceeding 4 inches in height. Do not treat if soybeans are below 8 inches tall. Soybean foliage receiving accidental spray or drift will be injured.

For best coverage use 4 flat fan nozzles per row, 2 ^{z z} ~~nozzles~~ on each side of row. The two forward nozzles should point forward and downward while the rear nozzles should point to the rear and also be directed downward. Nozzles so adjusted should cover the weed foliage with a minimum of contact to the soybean plant. The suggested application rate is 1 pint of GOAL (0.25 lb. active) per acre broadcast in a minimum of 25 gallons of water.

Do not apply a post-directed application of GOAL to soybeans within 90 days of harvest. Do not apply more than one application of GOAL to soybeans.

LASSO^R is a registered trademark of Monsanto Company.

TREFLAN^R is a registered trademark of Elanco Products Co.

GOAL^R and TRITON^R are registered trademarks of Rohm and Haas Company.

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of merchantability or fitness for a particular purpose, express or implied, extends to the use, storage or handling of this product contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. These risks include, but are not limited to damage to plants, crops and animals to which the material is applied, failure to control pests, damage caused by drift to other plants or crops, and personal injury.

101.1 - 103.0 Behavior in the Environment

Personal communication with C. Collier and S. Howard has revealed that Goal can be expected to: (1) persist in fields with a half life of approximately 60 days

RKH

(2) bioaccumu-

late in fish over 300 x.

Note: Future reviewers may wish to consider the concentrations in water and sediment calculated with Athens EPA's EXAM model. See Goal file (Oxyfluorfen).

Bob Hitch

VALIDATION SHEET

FORMULATION: Percent a.i. - 94%

CHEMICAL NAME: RH-2915

TEST ID NO: ES-F1

TEST TYPE: Fish acute 96-hour LC₅₀ (flow through)
Bluegill sunfish

VALIDATOR: Larry Turner

DATE: 3/2/78

CITATION: Bentley, Robert E. 1973. Acute toxicity of RH-2915 to Bluegill (Lepomis macrochirus) and Rainbow trout (Salmo gairdneri). 6p. submitted by Rohm & Haas Company, Acc # 095583, 11/9/76.

RESULTS: Bluegill sunfish LC₅₀ = 0.200 ppm (95% C.I. 0.130 - 0.310 ppm). No mortality occurred at 0.056 ppm; 83% mortality occurred at highest level of 0.320 ppm. Toxic symptoms included darkening, lethargy, and loss of equilibrium.

VALIDATION CATEGORY: Core

ABSTRACT: Bluegill sunfish were exposed to concentrations of RH-2915 of 0 (control), 0.056, 0.075, 0.100, 0.140, 0.180, 0.240, and 0.320 ppm. Procedures followed the 1970 edition of Standard Methods (APHA), according to investigators, although methods were not described so that this reviewer could compare them with the protocol. All reporting recommended in the protocol was furnished. Thirty fish were tested at each dose level. Fish had a mean length of 42 mm and weight of 1.0 g. Flow rate to the 30 liter test vessels was 5 L/hour. Water chemistry was reported and included a pH of 7.1 and temperature of 21°C + 1°. Mortality was analyzed by linear regression using logs and probits. Using the linear regression program on the TI calculator, this reviewer calculated an identical LC₅₀ value of 0.20 ppm.

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VALIDATION SHEET

TEST ID NO: ES-G1

TEST TYPE: Fish acute 96-hour LC₅₀ (flow through)
Rainbow trout.

FORMULATION: Percent a.i. - 94%

CHEMICAL NAME: RH-2915

VALIDATOR: Larry Turner

DATE: 3/2/78

CITATION: Bentley, Robert E. 1973. Acute toxicity of RH-2915 to Bluegill (Lepomis macrochirus) and Rainbow trout (Salmo gairdneri). 6 p. submitted by Rohm & Haas Company, Acc # 095583, 11/9/76.

RESULTS: Rainbow trout LC₅₀ = 0.410 (95% C.I. 0.310 - 0.560 ppm). No mortality occurred at the two lowest levels of 0.14 and 0.18 ppm; 83% mortality occurred at the highest level of 0.75 ppm. Toxic symptoms included darkening, lethargy, and loss of equilibrium.

VALIDATION CATEGORY: Core

ABSTRACT: Rainbow trout were exposed to concentrations of RH-2915 of 0(Control), 0.14, 0.18, 0.24, 0.32, 0.42, 0.56, and 0.75 ppm. Procedures followed the 1970 edition of Standard Methods (APHA), according to investigators, although methods were not described so that this reviewer could compare them with the protocol. All reporting recommended in the protocol was furnished. Thirty fish were tested at each dose level. Fish had a mean length of 80 mm and weight of 2.4 g. Flow rate to the 30 liter test vessels was 5 L/hour. Water chemistry was reported and included a pH of 7.1 and temperature of 11°C + 1°. Mortality was analyzed by linear regression using logs and probits. Using the linear regression program on the TI calculator, this reviewer calculated an identical LC₅₀ value of 0.41 ppm.

VALIDATION SHEET

TEST ID NO: ES-D1

TEST TYPE: Avian subacute dietary LC₅₀ - Bobwhite quail.

FORMULATION: Percent a.i. - (Phone communication from S. Krz^eminski, 3/31/78) 94% (letter from Cannon labs to Rohm & Haas, 5/4/78)

CHEMICAL NAME: RH-915 *lval*

VALIDATOR: Larry Turner

DATE: 3/2/78

CITATION: Terrell, York. 1973. Eight day dietary LC₅₀ study of RH-915 on Bobwhite quail and Mallard ducks. 30 p. submitted by Rohm and Haas Company, Acc #095583, 11/9/76.

RESULTS: Bobwhite quail dietary LC₅₀ = 390 ppm (standard error = + 22.7 ppm). No mortality occurred at 100 ppm; 100% mortality occurred at 1000 ppm. Toxic symptoms were dose related and included depression, feather erection, and staggering. Food consumption was markedly reduced at 500 ppm and higher levels.

VALIDATION CATEGORY: Core

CATEGORY RATIONALE: This study was classed as core in spite of the disparity between the submitted LC₅₀ value and that obtained by this reviewer. Since the reported value is the lower value, the discrepancy would work against the registrant. No other significant flaws were noted.

ABSTRACT: Bobwhite quail were exposed to dietary concentrations of RH-915 of 0(control), 100, 300, 400, 500, 750, and 1000 ppm. Procedures generally followed Subpart E, Hazard Evaluation, wildlife and aquatic organisms except as noted:

1. Birds were 5-7 days old at the start of the test.
2. No source or breeding history of birds was reported.

3. Housing conditions were not reported.

4. Percent a.i. was not reported.

Statistical analysis followed methods of Miller and Tainter (Experimental Biology and Medicine, Vol. 57, pp 261-264. 1944), which is an early log-probit method. Data were checked on TI 59, using Finney Probit, and yielded a substantially higher value of 479 ppm (95% c.i. 392-586 ppm).

VALIDATION SHEET

TEST ID NO: ES-E1

TEST TYPE: Avian subacute dietary LC₅₀ - Mallard duck.

FORMULATION: Percent a.i. - (phone communication from S. Krzy^eminski, 3/21/78). 94% (letter from Cannon labs to Rohm and Haas, 5/4/78)

CHEMICAL NAME: ^{Goal} Larry Turner

~~Validation~~
DATE: 3/2/78

CITATION: Terrell, York. 1973. Eight day dietary LC₅₀ study of RH-915 on Bobwhite quail and Mallard ducks. 30 p. submitted by Rohm and Haas Company, Acc #095583, 11/9/76.

RESULTS: Mallard duck dietary LC₅₀ >4000 ppm. No mortality occurred at any tested level from 1000 to 4000 ppm. Toxic symptom of depression was observed at all levels, with more birds affected at higher levels. Food consumption was somewhat reduced at higher levels.

VALIDATION CATEGORY: Core

ABSTRACT: Mallard ducks were exposed to dietary concentrations of RH-915 of 0(control), 1000, 2000, 2500, 3000, and 4000 ppm. Procedures generally followed Subpart E - Hazard Evaluation - wildlife and aquatic organisms except as noted:

1. Birds were 5-7 days old at start of test.
2. No source or breeding history of birds was reported.
3. Housing conditions were not reported.
4. Percent a.i. was not reported.

Statistical analysis was not performed because no mortality occurred.

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DATA REVIEW NUMBER: ES-VII-L

TEST: 96 hr LC₅₀ with an estuarine marine invert.

SPECIES: Palaemonetes pugio grass shrimp

RESULTS 96 hr LC₅₀ = 31.7 (26.1 - 38.4) ppb

in terms of RH2915

Test temperature 18°C

CHEMICAL: RH 2915 Technical, 74% A. I goal.

TITLE Acute Toxicity of RH 2915 technical, lot #7364 (74% Active Ingredient) to the grass shrimp. Palaemonetes pugio

ACCESSION NO. 096881

STUDY DATE: May 20, 1977

RESEARCHER: A. G. Vilkas, Union Carbide Environmental Sciences

REGISTRANT: Rohm & Haas Company

VALIDATION CATEGORY: Supplemental

CATEGORY REPAIRABILITY: When a marine exposure is expected this study should be considered to be core. The registrant is notified in the conclusions section that testing with a shrimp of the genus Penaeus is more desirable, however.

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DATA REVIEW NUMBER: ES-VII-H

TEST: Aquatic invertebrate 96 hr. LC₅₀

SPECIES: Elliptio complanata, Freshwater clam

RESULTS 96 hr. LC₅₀ = 9.57 ^{ppm} (95% C.I. 6.167 - 13.73 in terms of RH 2915)

Total hardness = 38 mg/L as Ca CO₃

Temperature = 20°C

CHEMICAL: RH 2915, Goal Technical, (74% a.i.)

TITLE Acute toxicity of RH 2915 Technical

Lot #7364 (74% A. I.) to the freshwater clam, Elliptio complanata.

ACCESSION NO. 096881

STUDY DATE: June 20, 1977

RESEARCHER: Algirdas G. Vilkas, Union Carbide Environmental Services

REGISTRANT: Rohm and Haas Company

VALIDATION CATEGORY: Supplemental

CATEGORY RATIONAL: EEB has no definite requirement for a freshwater clam study. Union Carbide references the committee on methods for toxicity tests with aquatic organisms (1975) as the source of their protocol, but the committee does not discuss or recommend tests with freshwater clams.

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DATA REVIEW NUMBER: ES-VII-H

TEST: 48 hr aquatic invertebrate acute toxicity

SPECIES: Daphnia magna

RESULTS 48 hr LC₅₀ = 1.5 (0.75 - 2.9 mg. a.i./L.)

Test temperature 22 ± 1.0°C.

CHEMICAL: RH-2915, lot # SW-75/0174 (82.2% active goal)

TITLE Acute toxicity of RH-2915 to

Daphnia magna

ACCESSION NO. 096881

STUDY DATE: Sept., 1976

RESEARCHER: Gerald A. LeBlanc. E. G. & G. Bionomics

REGISTRANT: Rohm and Haas

VALIDATION CATEGORY: Core

ABSTRACT: Tests were run in triplicate with a total of 15 daphnids at each test level. An acetone control and plain water control were also employed.

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DATA REVIEW NUMBER: ES-VII-F

TEST: Static acute 96 hr LC₅₀ on a warmwater fish

SPECIES: Channel catfish, Ictalurus punctatus

RESULTS Based on nominal concentrations (74% a.i. Goal)

the 96 hr LC₅₀ is 0.4 mg/L

(95% Confidence Interval = 0.36 - 0.45 mg./L.) at

22.0 ± 1.0°C and 44 mg/L total hardness as CaCO₃.

Channel catfish, exposed to 0.32 mg/L and higher,

demonstrated erratic swimming behavior and mucous

shedding.

CHEMICAL: Goal (RH 2915, 74% a.i.)

TITLE The acute toxicity of RH 2915 technical,

lot #7364 to channel catfish, Ictalurus punctatus (Rafinesque)

ACCESSION NO. 096881

STUDY DATE: May 26, 1977

RESEARCHER: William J. Kuc and George A. Cary. Union Carbide
Environmental Services

REGISTRANT: Rohm and Haas

VALIDATION CATEGORY: Core

ABSTRACT: Ten fish were used at 5 test levels.
Solvent and plain water controls were also
employed.

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DATA REVIEW NUMBER: ES-VII-N

TEST: 96 hr. LC₅₀ with a crab

SPECIES: Fiddler crab, Uca pugilator

RESULTS 30% mortality was demonstrated
at 560 mg/L and 20% mortality was demonstrated at 1000 mg/L.

CHEMICAL: RH 2915 Technical, Lot #7364

TITLE Acute toxicity of RH 2915 technical, lot # 7364 (74%
active ingredient)

ACCESSION NO. 096881

STUDY DATE: May 25, 1977

RESEARCHER: A.G. Vilkas and G. A. Cary Union Carbide Environmental
Services

REGISTRANT: Rohm and Haas Company

VALIDATION CATEGORY: Supplemental

CATEGORY RATIONALE: Even if a marine exposure is predicted, this
test on fiddler crabs would be judged supplemental as per Larry Turner's
Sept. 8, 1978 memo.

ABSTRACT: Even with 2.0 ml/L acetone in the test vessels, goal precipitated
out and also formed a surface scum.

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DATA REVIEW NUMBER: ES-VII-C

TEST: Acute Oral LD₅₀ for an upland game bird

SPECIES: Bobwhite quail

RESULTS Hazelton Laboratories derived an LD₅₀ of 5600 mg/kg. They only tested to 5000 mg/kg so the LD₅₀ is an unacceptable extrapolated value. Hazleton observed 1 mortality at 2500 mg/kg and no mortality at 1250 mg/kg so the LD₅₀ is clearly greater than 2000 mg/kg.

CHEMICAL: Goal (Called RH-2915) Technical 73.2% a.i.

TITLE Acute oral LD₅₀ in bobwhite quail RH-2915

final report.

ACCESSION NO. 096881

STUDY DATE: Sept. 12, 1977

RESEARCHER: Vincent J. Piccirillo

REGISTRANT: Rohm & Haas Company

VALIDATION CATEGORY: Supplemental

CATEGORY RATIONAL: The feeding consumption data and weights of the birds after the test should be presented.

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DATA REVIEW NUMBER: ES-VII-R

TEST: 48 hr. acute toxicity with oyster larvae

SPECIES: Oyster, Crassostrea virginica

RESULTS 48 hr. LC_{50} >32.0 ug/L

Observed no effect level is 3.2 ug/L *

Temperature: 24°C

*Larvae that were not at the straight - hinge stage of development were considered abnormal.

CHEMICAL: RH 2915 Technical Lot #7364 (74% a.i.)

TITLE The acute toxicity of RH 2915 technical lot # 7364 (74% a.i.) to the eastern oyster Crassostrea virginica.

ACCESSION NO. 096881

STUDY DATE: July 1, 1978

RESEARCHER: Algirdas G. Vilkas: Union Carbide Environmental Services

REGISTRANT: Rohm and Haas Company

VALIDATION CATEGORY: Supplemental

CATEGORY REPAIRABILITY: An exact LC_{50} is not determined. An extrapolated value is mentioned in the text but extrapolated LC_{50} values are not acceptable. Also, a marine exposure may not be expected with the current use pattern.

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104.1 Hazard assessment

A residue of 400 ppm would be predicted for short grass near or in a corn field receiving the maximum, two-pound-per-acre application. This residue level is greater than the dietary LC₅₀ for bobwhite quail so avian reproduction tests are requested in the conclusions to further test the safety of this product. The safety to birds of the proposed uses can be fully assessed when the avian reproduction tests are completed.

To determine the minimum distance which should be maintained between applicators and nontarget waterways the "Spray Drift" program was used on the EEB TI - 59 calculator. The following must be assumed when using this program:

1. No evaporation of droplets.
2. No air turbulence (the droplet is falling due to gravity only).

Quantitative values used in the program were as follows for waterways bearing nonendangered organisms.

1. The application height - 2 ft.
2. The critical concentration level in water = 1/2 the bluegill LC₅₀ or 0.1 ppm.
3. Application rate in pounds = 2.0
4. Maximum allowable windspeed = 5 mph

The calculated safe distance was 5.2 ft. It is recommended ^{on the basis of present data} ~~the conclusions~~ that applicators come no closer than 6 feet to any body of water. Chronic fish studies have been requested so this distance may have to be increased when the critical concentration level is based on chronic toxicity.

Waterways bearing endangered species should be protected with labeling requesting that the product not be used on lands within the drainage basin which includes the waterway. A list of these watersheds, the counties in which they lie, the states to which the counties belong, and the river into which the waterway flows is being requested from the Office of Endangered Species by this reviewer (See Feb. 22 memo in Goal file).

Because this herbicide can be expected to run off into aquatic habitats and persist there, the registrant is asked to supply fish reproduction studies with the fathead minnow.

107.4 Data Adequacy

The following studies, at a minimum, must be referenced or submitted by the registrant:

- A. Subacute dietary LC₅₀ for a wild waterfowl.
- B. Subacute dietary LC₅₀ for an upland game bird.
- C. Acute oral LD₅₀ for either a wild waterfowl or an upland game bird.
- D. Acute LC₅₀ for a coldwater fish (96 hr.)
- E. Acute LC₅₀ for a warmwater fish (96 hr.)
- F. Acute LC₅₀ for an aquatic invertebrate.

Because of the persistence of Goal in the terrestrial environment this application must be supported with:

- G. Avian reproduction studies on mallard ducks and bobwhite quail. The residue levels of Goal and its major metabolites should be determined when the birds are sacrificed as bioaccumulation was observed

in the flow-thru bluegill studies. Normally treatment levels are the environmental exposure level and five times this level. We recommend that the registrant meet with ^{EEO} ~~us~~ to determine the treatment levels. RKH

Because of the persistence of Goal in the aquatic environment and its tendency to run off, the following study is required:

- H. Fish reproduction studies with the fathead minnow (Pimephales promelas).

The Environmental Fate Branch has been requested by this reviewer to predict runoff concentrations which might accrue in marine habitats with the proposed use. If a significant marine concentration is predicted, the following studies will have to be submitted to support the proposed registration:

- I. A 48 hr. oyster - embryo LC₅₀ or 96 hr. oyster shell deposition study.
- J. A 96 hr. LC₅₀ with a marine or estuarine fish.
- K. A 96 hr. LC₅₀ with a marine or estuarine shrimp.

Study requirement (A) is filled by the 1973 study by Terrel in which the mallard LC₅₀ was determined to be greater than 4000 ppm.

Study requirement (B) is filled by the 1977 Piccirillo study on bobwhite quail in which the LC₅₀ was determined to be 390 ppm.

Study requirement (C) may be filled by the 1977 Piccirillo study on bobwhite quail when the feed consumption data and the weights of the birds at the end of the test are submitted.

Study requirement (D) is filled by the 1973 rainbow trout study by Bentley in which the 96 hr. LC₅₀ was determined to be 0.410 ppm.

Study requirement (E) is filled by the 1973 bluegill study by Bentley in which the LC₅₀ was determined to be 0.2 ppm. This study requirement is also satisfied by the Kuc and Cary (1977) channel catfish study.

Study requirement (F) is filled by the 1976 LeBlanc Daphnia magna study in which the LC₅₀ was determined to be 1.5 ppm.

The studies listed as (G) and (H) have not been referenced or submitted.

If study (I) becomes a requirement it cannot be filled by the 1978 Vilkas test as no LC₅₀ was determined in this oyster test.

Study (J) has not been referenced or submitted at this time.

Study (K), if it should become a requirement, will be filled by the 1977 Palaemonetes pugio study by Vilkas in which the LC₅₀ was determined to be 31.7 ppb. In the future, the genus, Penaeus, should be tested to fill EEB shrimp toxicity data requirements.

The 1977 Vilkas and Cary fiddler crab study and the 1977 Elliptio complanata clam study will be kept in EEB files in support of this registration.

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The Ecological Effects Branch is currently working with the U.S. Interior Department, Office of Endangered Species, in an effort to determine if additional label caution statements will be necessary to protect endangered species if Goal is registered.

Robert K. Hitch

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Date: Feb. 7, 1979

James W. Akerman
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