108501

(23)

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FEB BRANCH REVIEW

DATE: IN 2/2/78 OUT 3/2/78 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

DATA ACCESSION NO(S). 112919, 112920, 112851

FILE OR REG. NO. 241-EUP-80

PETITION OR EXP. PERMIT NO. 8G2040

DATE DIV. RECEIVED 1/31/78?

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

PRODUCT MGR. NO. Zink

PRODUCT NAME(S) Prowl 4E

COMPANY NAME American Cyanamid Company

SUBMISSION PURPOSE EUP on Sorghum

CHEMICAL & FORMULATION N-(1-ethylpropyl)-3,4-dimethyl-2,6

PROWL 4E dinitrobenzenamine..... 43.8%

Inert Ingredients..... 56.2%

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100.0 Pesticide Use

Prowl 4E will be applied postemergent and soil incorporated to control grasses such as foxtail species, barnyardgrass, seedling johnsongrass, fall panicum, Texas panicum, crabgrass and signalgrass, and broadleaf weeds such as pigweeds, lambsquarters, purslane, and kochia, in sorghum.

100.1 Application Method/Directions

Postemergence Incorporated Applications of PROWL in Sorghum

The field must be cultivated and all emerged weeds must be destroyed immediately before the application of PROWL. The cultivation should be accomplished with sweep or rolling cultivators operated at sufficient speed to throw at least one inch of soil over the bases of the sorghum plants. This will kill small weed seedlings growing in the sorghum row and will prevent direct contact of the zone of brace root formation by PROWL during application.

PROWL should be applied when sorghum is at the 6 to 8-inch stage of growth but may be applied as late as the lay-by growth stage of sorghum. When applied at the 6 to 8-inch stage of growth, less sorghum root injury will be caused by the equipment used to cultivate out emerged weeds and to incorporate PROWL than if PROWL is applied at later stages of sorghum growth. Also, at the 6 to 8-inch growth stage, weeds in the sorghum row will be small and more easily killed by soil thrown into the row during cultivation and PROWL soil incorporation.

Apply PROWL with ground equipment only.

Uniformly apply PROWL broadcast in 10 or more gallons of water per acre with ground equipment.

Uniform soil coverage must be obtained. Drop nozzles should be used if sorghum foliage will prevent uniform coverage of the soil surface.

Spraying Instructions

Use a properly calibrated low-pressure (20 to 40 psi) sprayer equipped with 8002 or larger size

Tee-Jet or comparable nozzles to achieve uniform spray distribution and minimize drift.

Keep the by pass line on or near the bottom of the tank to minimize foaming. Nozzle screens must be no finer than 50 mesh. DO NOT apply PROWL during periods of gusty winds or when wind velocity is greater than 10 mph.

Broadcast Treatment - Apply in water at specified rates.

## Mixing Instructions

Mix PROWL herbicide as specified on this label with water as follows:

1. Fill tank one-half to three-quarters full with clean water.

2. Add PROWL to the partially-filled tank while agitating and then fill the remainder of the tank with water.

3. Maintain good agitation at all times until spraying is completed. If the spray mixture is allowed to settle for any period of time, thorough agitation is essential to resuspend the mixture before spraying is resumed. Continue agitation while spraying.

## Additional Herbicides Applications

MILOGARD[R] [1/], BLADEX[R] 80W Herbicide [2/], and atrazine [3/] are labelled for use in sorghum as preplant and/or

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1/ MILOGARD[R] is a trademark of CIBA-GEIGY for propazine.

2/ BLADEX[R] is a registered trademark of Shell Chemical Company. (Cyanazine)

3/ There are several brand names for atrazine, including AATREX[R], a registered trademark of CIBA-GEIGY.

preemergence treatments. Consult the labels of those herbicides for suggested treatments, rates to be used, and precautions and restrictions for use in sorghum, and for follow crops restrictions. Postemergence incorporated applications of PROWL may be applied to sorghum fields previously treated with preplant and/or preemergence applications of those compounds.

PROWL must be thoroughly and uniformly incorporated into the soil to a depth of 1 to 2 inches with sweep or rolling cultivators. For best results, application and soil incorporation should be accomplished in the same operation. Soil incorporation of PROWL may be carried out at any time within 3 days of application but must be completed prior to an irrigation or rainfall in order to obtain thorough soil incorporation, and to reduce injury to regrowing sorghum roots caused by incorporation implements.

During incorporation, some treated soil must be moved over the bases of the sorghum plants in order to improve control of weeds that might germinate in the rows.

After the application and incorporation of PROWL, if the row middles become compacted because of irrigation or rainfall, or if weeds not controlled by PROWL emerge through the PROWL-treated zone, the field may be cultivated with rolling cultivators or sweep cultivators at a cutting depth no greater than was used for soil incorporation of PROWL.

DO NOT APPLY PROWL preplant incorporated or preemergence to sorghum.

DO NOT APPLY PROWL postemergence prior to the 6-inch growth stage of sorghum.

The following weed species are susceptible to postemergence incorporated treatments of PROWL at the rates recommended for each soil texture listed.

Crabgrass (Digitaria spp.)
Barnyardgrass (Echinochloa crus-galli)
Green foxtail (Setaria viridis)
Fall panicum (Panicum dichotomiflorum)
Texas panicum (Panicum texanum)
Johnsongrass (from seed) (Sorghum halepense)
Giant foxtail (Setaria faberii)
Signalgrass (Brachiaria platyphylla)
Goosegrass (Eleusine indica)
Redroot pigweed (Amaranthus retroflexus)
Purslane (Portulaca oleracea)
Lambsquarters (Chenopodium album)
Kochia (Kochia scoparia)
Carpetweed (Mollugo verticillata)
Spurge (Annuals) (Euphorbia spp.)

100.2 Application Rates

Postemergence Incorporated Broadcast
Rate Per Acre for PROWL in Sorghum

| Soil Texture | PROWL |
|---|---|
| Coarse | 1.0 to 2.0 pints |
| Medium | 1.5 to 2.25 pints |
| Fine | 1.5 to 3.0 pints |

One gallons contains 4 lbs. active ingredient. The high rates of PROWL should be used if heavy weed infestations were present in the field at the time of the preapplication cultivation.

NOTE: Livestock can graze or be fed forage from PROWL-treated sorghum fields. PROWL-treated land can be planted to other crops in the following year.

100.3 Precautionary Labeling

ENVIRONMENTAL HAZARDS

**This product is toxic to fish. Keep out of lakes, streams or ponds.**

**DO NOT apply when weather conditions favor drift from target area. DO NOT contaminate water by cleaning of equipment or disposal of wastes.**

100.4 Proposed EUP Programs

Research trials during 1974, 1975, 1976, and 1977 demonstrated that PROWL applied postemergence incorporated effectively controlled annual grasses and certain broadleaf weeds that commonly infest sorghum fields.

Under the proposed experimental program, PROWL will be applied postemergence incorporated at rates of from 0.05 to 1.50 lb ai/A dependent on the soil texture and weed infestation density. These rates will control grasses such as foxtail species, barnyardgrass, seedling johnsongrass, fall panicum, Texas panicum, crabgrass and signalgrass, and broadleaf weeds such as pigweeds, lambsquarters, purslane, and kochia. All emerged weeds must be destroyed by cultivation immediately prior to the application of PROWL because PROWL does not control established weeds.

Growers who have applied herbicides such as atrazine, Milogard, or BLADEX as preemergence treatments, will be permitted to apply PROWL postemergence incorporated according to directions on the proposed label.

PROWL will be distributed by American Cyanamid Company to cooperating growers who participate in the proposed program. The proposed experimental program will require 556 acres and 400 pounds of PROWL (active ingredient in 100 gallons of PROWL 4E formulation).

Information follows with respect to the proposed acreage to be treated in each state, and the gallons of PROWL 4E to be shipped.

Sorghum - Program for PROWL® herbicide for Application Under an Experimental Use Permit Label - 1978

| State | Acreage Grown[1] | Acres to be Treated | Gallons of PROWL 4E Requested |
|---|---|---|---|
| Texas | 5,800,000 | 170 | 32 |
| Kansas | 3,950,000 | 75 | 14 |
| Nebraska | 2,100,000 | 75 | 14 |
| Oklahoma | 730,000 | 50 | 10 |
| Colorado | 259,000 | 25 | 4 |
| New Mexico | 199,000 | 20 | 3 |
| South Dakota | 152,000 | 20 | 3 |
| Missouri | 600,000 | 35 | 6 |
| California | 210,000 | 25 | 4 |
| Arkansas | 310,000 | 25 | 4 |
| Arizona | 125,000 | 12 | 2 |
| North Carolina | 90,000 | 6 | 1 |
| Louisiana | 37,000 | 6 | 1 |
| Georgia | 45,000 | 6 | 1 |
| Illinois | 59,000 | 6 | 1 |
| | | 556 | 100 |

[1] Acres in 1976, USDA Agricultural Statistics

## Plot Selection and Treatment

Select a portion of your existing sorghum acreage to be used for the evaluation of PROWL. The field may have been treated previously with a preplant or preemergence application of a registered sorghum herbicide. First, kill all emerged weeds in the field by a thorough cultivation according to directions on the label in this kit. Then apply PROWL at the recommended rate and incorporate PROWL according to label directions. Leave a portion (4 rows wide by 50 feet long) of the cultivated area untreated with PROWL to serve as a check.

## Application Rates

PROWL is an effective herbicide in sorghum when used as a postemergence incorporated treatment for selective control of annual grasses and certain broadleaf weeds. Read the label and select the appropriate PROWL treatment recommended for your soil and weed infestation density. The American Cyanamid Agriculturist will help you select the appropriate PROWL treatment for your field.

## Mark the Plot

Too often a poorly marked test is lost and no data can be taken. To avoid this, establish permanent markers which define the treatment areas and which will not be destroyed during cultivating. Record the plot plan in your record book or some other permanent place as an insurance against loss of the test location. This plan should list the treatments and their locations in relation to some permanent marker such as a powerline pole, fence post, or other object which can be readily identified later.

## Calibrate your Equipment

It is very important to calibrate your equipment accurately before you apply your herbicide.

100.4.1 Objectives

It is intended that by treating the proposed acreages with PROWL herbicide, the performance of PROWL will be determined for a wide range of soil and environmental conditions under grower use conditions. Data will be obtained with respect to weeds controlled, crop selectivity, and effects on the environment.

The residue data in this application demonstrate that when PROWL is applied in accordance with the proposed directions on the label, no apparent residues of PROWL occur in the sorghum grain or foliage.

The participating growers will be requested to evaluate the performance of PROWL herbicide approximately four weeks after application, and the responsible American Cyanamid Field Agriculturist will make another evaluation at approximately 8 weeks after application. Yield data and residue data will be collected as needed.

The residue data in Section D (not provided for review) show that apparent residues of N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine and its metabolite, 4-[(1-ethylpropyl) amino]-2-methyl-3,4-dinitrobenzyl alcohol, in or on sorghum fodder, forage, and grain were below the validated sensitivity of the methods used (0.05 ppm). On this basis, a temporary tolerance for combined residues of PROWL and its metabolite of 0.10 ppm in or on sorghum fodder, forage, and grain is proposed when used in accordance with the directions.

The issuance of an experimental use permit to cover shipments of PROWL herbicide for experimental use only on sorghum would enable us to obtain more information concerning weed species controlled by PROWL in sorghum and possible phytotoxicity to sorghum by PROWL.

101.0 Chemical and Physical Properties

101.0 Chemical Name

Active Ingredient

N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine

Technical grade chemical - expected level = 91-94%

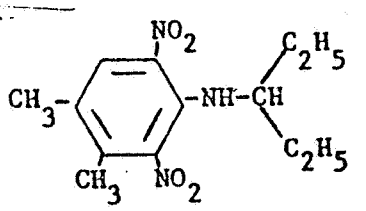
Formulated Product (PROWL 4E)

| | |
|---|---|
| Active Ingredient..... | 43.8% |
| Inert Ingredients..... | 56.2% |

101.2 Common Name(s)

Prowl, Prowl 4E, AC 92553, CL 92533, Penoxalin, Pendimethalin

101.3 Structural Formula




101.3.1 Empirical Formula

$N_3O_4C_{13}H_{19}$

101.4 Molecular Weight

281.3

101.5 Physical State

| | |
|---|---|
| Color and State ..... | Orange-yellow crystals |
| Odor ..... | Faint nutty odor |
| Boiling point ..... | 330°C |
| Melting Point ..... | 56-57°C |
| Specific gravity ..... | 1.19 at 25°C |
| Vapor Pressure ..... | $3.0 \times 10^{-5}$ mm. Hg at 25°C |

101.6 Solubility ..... Less than 0.5 ppm in water at 20°C, soluble in chlorinated hydrocarbon and aromatic solvents.

Stability ..... Stable to alkaline and acidic conditions

Corrosiveness ..... Non-corrosive.

102.0 Behavior in the Environment

See Environmental Safety review by N. Cook (28 March 1977).

From Environmental Chemistry Review Summaries dated 2/19/76 and 12/30/74:

CONCLUSIONS

PROWL

Soil metabolism - anaerobic metabolism of parent is more rapid than aerobic metabolism but breakdown products are more rapidly metabolized aerobically than anaerobically.

Soil persistence - halflife of Prowl is 12-16 months.

Hydrolysis - Prowl is stable at pH 5, 7 and 9 at 25°C in dark.

Photolysis - Soil TLC - 33-56% of applied activity lost in 8 weeks, while 87% of applied activity is lost from glass slides in 24 hours. No volatilization from water solution but all parent is degraded in 1 week. Prowl volatizes under phytolysis.

Leaching - not significant.

Microbial - microbes do not degrade parent nor does Prowl affect microbe activities.

Fish Bioaccumulation PP5F1556 -

A. Catfish Accumulation Study -

Conclusions

1. Maximum boiaccumulative uptake of 14C equivalent to parent CL92553 by edible tissue of catfish was 1450 times the concentration in water.

2. Maximum boiaccumulative uptake of 14C equivalent to parent CL92553 by viscera of catfish was 2044 times the concentration in water.

3. Uptake by edible tissue plateaued at day 14 and then declined through final 28 days, with more than 95% of plateau level disaccumulated from edible tissue by end of withdrawal phase.

While CL92553 bioaccumulates to a significant degree in catfish in the first 14 days of exposure, continued exposure after 14 days does not cause further bioaccumulation and disaccumulation apparently occurs. Disaccumulation occurs to the extent that more than 99% of bioaccumulation is gone from catfish muscle tissue.

B. Uptake and metabolism of 14C-CL92553 by Guppies -

Conclusions

Guppies bioaccumulate 14C up to 90 times concentration in water. However parent compound is less than 10% of 14C in water, due to metabolism by guppies or microorganisms in pond water.

Rotational crops - no significant residues found.

Disposal - label disposal information suffices.

103.0 Toxicological Properties

See EPA Accession numbers: 112919, 112920, 112851.

103.1 Acute Toxicity

103.1.1 Mammal

See Toxicology Review 761896, 18 February 1977.

| Organism | Test | Results |
|---|---|---|
| Rat | Acute Oral $LD_{50}$ (Technical) | 1.25 g/kg - male |
| | " " " " | 1.05 g/kg - female |
| Mouse | " " " " | 1.62 g/kg - male |
| | " " " " | 1.34 g/kg - female |
| Rat | Oral $LD_{50}$ (4E-formulation) | 3.38 g/kg |

103.1.2 Bird

See Review by L. Windberg, 9/22/77.

| Organism | Test | Results |
|---|---|---|
| Mallard | Acute Oral $LD_{50}$ | 1,421 (938-2152) mg/kg [Core] |

103.1.3 Fish

See Review by L. Windberg, 9/22/77.

| Organism | Test | Results |
|---|---|---|
| Bluegill sunfish | 96-hr Acute $LC_{50}$ | 0.20 (0.16-0.24) ppm [Supplemental] |

| Organism | Test | Results |
|---|---|---|
| Channel catfish | 96-hr Acute $LC_{50}$ | 0.42 (0.31-0.56) ppm [Supplemental] |
| Bluegill sunfish | 96-hr Acute $LC_{50}$ | 1.04 (0.69-1.57) ppm [Invalid] |
| Bluegill sunfish | 96-hr Acute $LC_{50}$ | 0.92 (0.71-1.20) ppm [Invalid] |
| Rainbow trout | 96-hr Acute $LC_{50}$ | 0.14 (0.11-0.17) ppm [Supplemental] |
| Rainbow trout | 96-hr Acute $LC_{50}$ | 1.00 (0.78-1.29) ppm [Invalid] |
| Rainbow trout | 96-hr Acute $LC_{50}$ | 0.52 (0.39-0.69) ppm [Invalid] |

103.1.4 Aquatic Invertebrate

See Review by L. Windberg, 9/22/77.

| Organism | Test | Results |
|---|---|---|
| Daphnia magna | Acute $LC_{50}$ | 0.28 (0.23-0.33) ppm [Core] |

103.2.0 Dermal Toxicity

See Toxicology Review 761896, 18 February 1977.

103.3.1 Mammal

| Organism | Test | Results |
|---|---|---|
| Rabbit | Dermal $LD_{50}$ (Technical) | >5 g/kg |
| Rabbit | Skin irritation (Technical) | not irritating |
| Rabbit | Eye irritation (Technical) | not irritating |
| Rabbit | Dermal $LD_{50}$ (4E formulation) | >2 mg/kg |
| Rabbit | Skin irritation (4E formulation) | moderate to severe irritant |

| Organism | Test | Results |
|---|---|---|
| Rabbit | Eye irritation (4E formulation) | very slight and reversible irritation |

103.3.0 Subacute Toxicity

Bird

| Organism | Test | Results |
|---|---|---|
| Bobwhite quail | 8-day dietary $LC_{50}$ | 4,187 (3,149-5,567) ppm [Core] |
| Mallard | 8-day dietary $LC_{50}$ | >4,640 ppm [Core] |

Mammal

| Organism | Test | Results |
|---|---|---|
| Rabbit | 21-Day Dermal | No effect for 1 g/kg/day technical, slight to moderate erythma and edema for 2 ml/kg/day of 4E formulation. |

103.4.0 Chronic Toxicity

103.4.1 Mammal

| Organism | Test | Results |
|---|---|---|
| Rat | 90-Day feeding study | -NEL = 500 ppm |
| Dog | 90-Day feeding study | -NEL = 62.5 mg/kg or 2500 ppm |
| Rat | 2 yr. feeding study | -NEL = 500 ppm, no oncogenic effects |
| Mouse | 18 mo. study | -NEL = 500 ppm, no oncogenic effects |
| Rat | 3 generation study | -NEL = 500 ppm |
| Rat | Teratology | NE at 1 g/kg/day |
| Rat? | Dominant lethal study | NE at 2500 ppm (highest dose) |
| Rat? | Effects on male mammary glands | NE at 5000 ppm (highest dose) |

103.4.3 Fish

| Organism | Test | Results |
|---|---|---|
| Fathead minnow | Chronic fish study | Currently under review by the Environmental Safety Section |

The fathead minnow chronic fish study is currently in review. There are some discrepancies between the results and conclusions, and this section has requested raw test data from the registrant. Completion of the review awaits submission of this data.

104.0 Hazard Assessment

104.1 Discussion

Formulations of Prowl are currently registered for use in pre-emergent broadcast or pre-plant incorporated applications for control of undesirable vegetation in field corn, cotton and soybeans. The proposed EUP calls for postemergence incorporated applications of Prowl 4E formulation in Sorghum. The proposed application rates vary from 0.5 lbs per acre to 1.5 lbs per acre active ingredient depending upon soil texture and amount of weed infestation present in the field at the time of the preapplication cultivation. The maximum rate would be applied to Sorghum grown in soils with fine textures and where preapplication weed infestations are heavy.

104.1.1 Likelihood of Exposure to Nontarget Organisms

Birds

Sorghum fields come under extensive use by sandhill cranes, upland game birds, and song birds during certain times of the year (Ref. a). At the time Prowl 4E will be applied to sorghum (at the 6 to 8" growth stage) some birds may be utilizing the fields for cover, loafing, or nesting. However, there is

little opportunity for avian species to ingest the chemical during any part of the season because: (1) avian species that feed on sorghum, feed exclusively on the seeds, and the seeds are produced later in the growing season after the herbicide has been incorporated into the soil; (2) any chemical that remains on the leaf or soil surface quickly volatilizes or photodegrades; (3) Prowl 4E is soil incorporated; (4) Prowl 4E is applied by ground equipment only, and if sorghum foliage prevents uniform coverage of the soil surface, drop nozzles are recommended.

Mammals

Utilization of sorghum fields by Mammals during the early planting season would not be substantial.

Aquatic Organisms

Because Prowl 4E is applied by ground equipment only and the runoff potential is low, a hazard to aquatic habitats should not occur if label directions are followed.

Plants

There is little likelihood of nontarget plant injury due to the method of application and degradation properties.

Summary

The use of postemergence incorporated applications of Prowl in Sorghum is expected to result in minimal hazard to nontarget wildlife.

104.1.2 Endangered Species Considerations

This reviewer has determined that the proposed EUP for Prowl 4E in Sorghum poses little or no hazard to Endangered Species. In arriving at this conclusion, this reviewer considered the following: (1) the low toxicity of Prowl to birds and mammals,

(2) the unlikely potential for exposure to aquatic organisms, (3) the small acreage to be treated (556 acres).

If and when the registrant requests registration for Prowl 4E in Sorghum, a complete Endangered species hazard evaluation will be required.

104.1.3 Adequacy of Toxicity Data

1. See Section 107.4.

2. N. Cook, in his review of 3/28/77, suggested that there was a need for avian reproductive studies for Prowl. However, this reviewer has determined that the proposed use pattern does not indicate a need for such studies at the present time (see rationale in Section 104.1.1).

104.1.4 Additional Data Required

See Section 107.5.

107.0 Conclusions

The Environmental Safety Section concurs with the proposed EUP for Prowl 4E in Sorghum.

107.1 Environmental Fate and Toxicology (Acknowledgement)

During the course of this review, the following Environmental Chemistry and Toxicology reviews were consulted:

Environmental Chemistry - 12/30/74 and 2/19/76
Toxicology - 2/18/77

107.3 Labeling

The Environmental Hazards label must be ammended to read as follows:

"This product is toxic to fish and other aquatic organisms. Keep out of. . ."

107.4 Data Adequacy

1. Avian acute toxicity - The registrant has submitted acceptable tests for an avian acute oral $LD_{50}$ and two avian 8-day dietary $LC_{50}$'s.

2. Aquatic invertebrate acute toxicity - The registrant has submitted an acceptable test of acute 48-hour $LC_{50}$ for freshwater aquatic invertebrates.

3. Fish acute toxicity - Tests of acute 96-hour $LC_{50}$ for warmwater and coldwater fish were unacceptable because the registrant failed to provide one or more of the following pieces of information: (1) identity of the test material, (2) the number of fish tested per treatment level, (3) the type and quantity of solvent used (if any) to dissolve the technical grade of the product for aquatic testing.

4. The fathead minnow chronic fish study is currently in review. There are some discrepancies between the results and conclusions, and this section has requested raw test data from the registrant. Completion of the chronic fish review awaits submission of this data.

107.5 Data Requests

Before registration is considered for Prowl 4E in Sorghum, the 96-hour acute $LC_{50}$'s for a coldwater and warm water species (bluegill sunfish) of fish are required on the technical grade of Prowl. Studies previously submitted using the technical grade chemical may be acceptable if the following information is submitted to this section for review: (1) the number of fish tested per treatment level, and (2) the type and quantity of solvent used, if any, to dissolve the technical grade of Prowl for aquatic testing. Fish bioassays previously submitted

using Prowl formulations will not satisfy the need for testing of the technical product.

Douglas J. Urban
March 2, 1978
Environmental Safety Section
EEEB
Registration Division

HTC

Reference:

a. Gusey, W. F. and Zenaida D. Maturgo. 1973. Wildlife Utilization of Croplands. Environmental Affairs, Shell Oil Company, Houston, Texas.

241-EUP-80 Prowl on Sorghum — 1978

# Experimental Use Permit Label Information

1. What is the value of an Experimental Use Permit Label?

   The granting of an Experimental Use Permit label by the Environmental Protection Agency means that the product has been tested and that it will perform under normal growing conditions when used according to the label directions. The use of the Permit allows us to apply PROWL under grower conditions over a wide geographic area and increases our knowledge of the product. This enables us to prepare accurate recommendations for full label registration for the use of PROWL in sorghum.

2. Can the crop be harvested and sold?

   Yes, the crop may be harvested and sold in the usual manner.

3. Can a product be sold under an Experimental Use Permit?

   Yes. However, American Cyanamid will provide you with a sufficient amount of PROWL herbicide free for your participation in this program. The grower does assume responsibility for reporting the results of his use of PROWL herbicide.

4. Does a farmer take much risk in using this product?

   An Experimental Use Permit is issued only after enough research work has been done so that the grower can expect it to perform as indicated on the label when used according to directions.

5. Who must complete the "Record of Use" forms S1 and S2?

   Each grower who uses PROWL herbicide on sorghum. The Cyanamid representative who delivered PROWL herbicide to you will provide advice and assistance at your request.

## Reports

The information requested in the following reports is required by the Environmental Protection Agency. Please telephone us collect at (609) 799-3220 if you have any questions about these reports.

### S1-Herbicide Applied

Complete and mail this report immediately after you have applied the herbicide to your sorghum field. This will complete our records on your name, address, and the PROWL treatment you have applied.

### S2-Evaluation for Weed Control

Complete and mail this report immediately after evaluating the PROWL-treated sorghum fields (4 weeks after application).

Procedure - Inspect your untreated check plot and determine the grasses and broadleaf weed species and also the population (light, moderate, heavy). Then go to the PROWL-treated plots and evaluate the weed control for each species using Form S2. Rate the weed control for each species by the appropriate % control range (0-75, 75-85, 85-95, 95-100%). First, rate your grass species and then rate your broadleaf weeds. If you cannot identify the grass or broadleaf species, make a note of the number of the major grasses and broadleaf species involved.

NOTE:

American Cyanamid personnel will evaluate your field at a later date (approximately 8 weeks after treatment). At harvest time, a visual rating of crop condition will be recorded and yields will be taken at some sites.

S1

Fill out this card on the day PROWL herbicide is applied to your sorghum. Mail Immediately.

Name of Grower _____

Address _____ City _____

State _____ Zip Code _____ Telephone _____

Date Crop Planted _____ Sorghum Variety _____

Date PROWL Applied _____

Acres Treated _____ Quarts of PROWL Used _____

Height of Sorghum at Time of Application of PROWL _____ inches.

Field Evaluation of PROWL Herbicide for Weed Control in Sorghum

$2

f Grower _____ RATING DATE _____

. 609___-78- _____

TIME OF INCORPORATION OF PROWL:

_____Days After Application

_____ pts. Postemergence Incorporated at _____-inch stage of sorghum growth.

| | % Control (check one) | | | | BROADLEAF | % Control (check one) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-75 | 76-85 | 86-95 | 96-100 | | 0-75 | 76-85 | 86-95 | 96-100 |
| oxtail | | | | | Pigweed | | | | |
| dgrass | | | | | Lambsquarters | | | | |
| s | | | | | Purslane | | | | |
| ss | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

TIME OF INCORPORATION OF PROWL:

_____ Days After Application

___ pts. Postemergence Incorporated at _____-inch stage of sorghum growth.

| | % Control (check one) | | | | BROADLEAF | % Control (check one) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-75 | 76-85 | 86-95 | 96-100 | | 0-75 | 76-85 | 86-95 | 96-100 |
| oxtail | | | | | Pigweed | | | | |
| dgrass | | | | | Lambsquarters | | | | |
| s | | | | | Purslane | | | | |
| ss | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

TIME OF INCORPORATION OF PROWL:

_____ Days After Application

____pts/A Postemergence Incorporated at _____-inch stage.

| | % Control (check one) | | | | BROADLEAF | % Control (check one) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-75 | 76-85 | 86-95 | 96-100 | | 0-75 | 76-85 | 86-95 | 96-100 |
| oxtail | | | | | Pigweed | | | | |
| dgrass | | | | | Lambsquarters | | | | |
| s | | | | | Purslane | | | | |
| ss | | | | | | | | | |
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ndard Herbicide Treatment _____ at _____ lbs/A PE☐ PPI☐

| | % Control (check one) | | | | BROADLEAF | % Control (check one) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-75 | 76-85 | 86-95 | 96-100 | | 0-75 | 76-85 | 86-95 | 96-100 |
| xtail | | | | | Pigweed | | | | |
| grass | | | | | Lambsquarters | | | | |
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| | | | | | | | | | |

Will supplement EUP on Sorghum (1978
PROWL 241-EUP-80

# Agriculturists

## NORTHCENTRAL REGION

Mr. W. S. Van Scoik
306 Blue Ridge Parkway
Madison, WI 53706
608-831-6928

Ms. L. A. Gallemore
1712 Melanie Lane, Apt. #9
Sioux Falls, SD 57103
605-336-9326

## SOUTHCENTRAL REGION

Mr. P. J. Ogg
3619 Mountain View Avenue
Longmont, CO 80501
303-772-0843

Mr. J. A. Behm
1721 Iowa Avenue, Apt. #5
York, NE 68467
402-362-4078

Mr. J. H. Blalock
702 Headlee Lane
Denton, TX 76201
817-387-7249

Mr. G. F. Goddard
1100 Itasca
Plainview, TX 79072
806-296-5373

Mr. J. C. Klauzer
P. O. Box 937
Manhattan, KS 66502
913-494-2486

## WESTERN REGION

Mr. A. O. Jensen
106 Las Vegas
Orinda, CA 94563
415-254-3103

Mr. D. R. Colbert
2133 Jackson Street
Lodi, CA 95240
209-369-1102

Mr. R. S. Nielsen
1140 West Escalon
Fresno, CA 93711
209-439-5741

## NORTHEAST REGION

Mr. H. H. Nau
118 Howard Way
Pennington, NJ 08534
609-466-0769

Mr. L. M. English
1414 E. Lexington Circle
Georgetown Estates
Columbia, MO 65201
314-445-7246

## SOUTHEAST REGION

Mr. J. B. O'Neil
2997 Gant Place
Marietta, GA 30060
404-971-8080

Mr. J. W. Hodges
Rt. 1, Pine Needle Place
Box 20-A
Tifton, GA 31794
912-382-6764

SOUTHEAST REGION (cont'd)

Mr. R. S. Matthews
P. O. Box 5021
3810 Norman Street
Martin Park
Alexandria, LA 71301
318-443-7927

Dr. T. E. Slack
Indian Hills Apts.
2011 Aztec Drive, Natchez #6
North Little Rock, AR 72116
501-835-4842

Mr. F. R. Walls
1912 Carolina Circle
Goldsboro, NC 27530
919-736-2869

AMERICAN CYANAMID COMPANY
AGRICULTURAL DIVISION
POST OFFICE BOX 400 PRINCETON, N J 08540
AREA CODE 609 799 0400

Dear Sir:

PROWL® herbicide is a selective herbicide currently registered for use in corn, soybeans, and cotton. It also has effectively controlled annual grass weeds and certain annual broadleaf weeds in sorghum. Please refer to the label for information on the proper use of PROWL herbicide. If you have a problem or require further information, call collect to the Cyanamid Technical Service Center (609) 799-3220, 24 hours a day, seven days a week.

We would like to suggest the following to make the evaluation of this product meaningful.

1. Read the label carefully and follow directions. Your field may have been treated previously with a preplant or preemergence application of a registered herbicide. Treat a selected part of your field with PROWL herbicide after killing existing weeds by cultivation. Leave a small portion of the cultivated area untreated with PROWL as a check. (The untreated area should be 4 rows wide.)

2. Evaluate crop stand, crop vigor, and weed control by species about 4 weeks after application of PROWL. Maintain the untreated area for the remainder of the season by the same means you normally use in culture of your sorghum crop.

3. Record your findings on the "Record of Use and Field Evaluation Form S2". Include observations on specific weeds, estimated percent control of each species of weed by PROWL herbicide applied postemergence incorporated, and by your standard preplant or preemergence herbicide.

4. The Environmental Protection Agency closely monitors all pesticides being used under an Experimental Use Permit. The use of this product carries with it the obligation to report your results to American Cyanamid Company. Cyanamid is then obligated to report the results to the Environmental Protection Agency.

5. Your local Cyanamid representative will make an evaluation of the PROWL performance approximately 8 weeks after application. Yield and residue data will be collected from selected sites.

Sincerely,

Cyril A. Kust

Cyril A. Kust
Program Coordinator

Dr. Cyril A. Kust, Program Coordinator, American Cyanamid Company, Princeton, New Jersey, will be responsible for the total coordination of the permit program for American Cyanamid. Mr. H. H. Nau (118 Howard Way, Pennington, New Jersey 08534), Regional Coordinator, Northeast Region; Mr. W. S. Van Scoik (305 Blue Ridge Parkway, Madison, Wisconsin 53706), Regional Coordinator, North Central Region; Mr. J. B. O'Neil (2997 Gant Place, Marietta, Georgia 30060), Regional Coordinator, Southeast Region; Mr. P. J. Ogg (3619 Mountain View Avenue, Longmont, Colorado 80501), Regional Coordinator, South Central Region and Mr. A. O. Jensen (106 Las Vegas, Orinda, California 94563), Regional Coordinator, Western Region, will be American Cyanamid Company's field coordinators for states under their supervision as illustrated in the attached map.