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IEEE BRANCH REVIEW

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EFFICACY

FILE OR REG. NO. _____

PETITION OR EXP. PERMIT NO. 241-EUP-63G

DATE DIV. RECEIVED 12/23/75

DATE OF SUBMISSION 12/16/75

DATE SUBMISSION ACCEPTED. _____

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

PRODUCT MGR. NO. Libby Zink

PRODUCT NAME(S) Prowl Herbicide

COMPANY NAME American Cyanamid Company, Agricultural Division

SUBMISSION PURPOSE (EUP for use on certain soil) type in field corn.

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

..... 43.8% (4[#] ai/gal.)

ENVIRONMENTAL SAFETY

100.0 Pesticidal Use

100.1 Application Methods/Directions/Rates

GENERAL INFORMATION

PROWL herbicide controls most annual grasses and certain broad-leaf weeds in field corn and cotton. PROWL controls weeds as they germinate, but will not control established weeds. Cultivate to destroy existing weeds before PROWL application. Apply with ground equipment only.

Observe all cautions and limitations on this label and the labels of products used in combination with PROWL. The use of PROWL not consistent with this label may result in injury to crops, animals, or persons. Keep container closed to avoid spills and contamination.

Mixing and Spraying Instructions

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

1. Fill tank one-half to three-quarters full with clean water.
2. When using PROWL alone, add PROWL to partially-filled tank while agitating and then fill the remainder of the tank with water.
3. (a) When using PROWL with a wettable powder herbicide, make a slurry of the wettable powder in water (1 part WP + 2 parts water). Add the slurry slowly into the partially-filled tank while agitating.

(b) When the slurry is properly mixed, add PROWL to the tank. Fill the remainder of the tank with water.
4. (a) When using PROWL with a flowable herbicide, pre-mix one part of flowable and one part water and add this diluted mixture into the partially-filled tank while agitating.

(b) When the flowable is properly mixed, add PROWL to the tank. Fill the remainder of the tank with water.

5. 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.

Use a properly calibrated low-pressure (20-40 psi) sprayer equipped with 8003 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. Test compatibility of PROWL with the liquid fertilizer selected.

GROUND APPLICATION

Broadcast Treatment - Apply in 10 or more gallons of water or in 20 or more gallons of liquid fertilizer per acre. Do not apply during periods of gusty winds or winds in excess of 10 mph.

Band Treatment - Apply a broadcast equivalent rate and volume per acre. To determine these:

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast RATE per acre} = \text{Band RATE per acre}$$

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast VOLUME per acre} = \text{Band VOLUME per acre}$$

AERIAL APPLICATION

Apply in 5 or more gallons of water per acre. To minimize drift, do not apply during periods of gusty winds or winds in excess of 5 mph. It is recommended that a flagman or an automatic mechanical flagging unit on the aircraft be used to avoid overlapping and possible crop injury.

Field Corn - Preemergence Applications

The seed bed should be firm and free of clods and trash. Apply PROWL at planting or after planting corn but before weeds or the crop emerge. DO NOT INCORPORATE. Do Not Apply Prior To Planting Corn Or Postemergence To Corn.

PROWL is most effective in controlling weeds when adequate rain-fall or overhead irrigation is received within 7 days of application. If cultivation is necessary because of soil crusting, soil compaction, or weed germination before rain or irrigation, use shallow tillage (1 to 2 inches) to minimize dilution of the herbicide. Unusually, cold, excessively wet, or hot dry conditions that delay germination or extend germination over a long period of time may reduce weed control. Under these abnormal conditions, there may be a temporary yellowing of seedling corn, but recovery will be rapid when good growth conditions return.

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

Green foxtail (Setaria viridis)
Yellow foxtail (Setaria lutescens)
Giant foxtail (Setaria faberi)
Barnyardgrass (Echinochloa crus-galli)
Fall panicum (Panicum dichotomiflorum)
Witchgrass (Panicum capillare)
Texas panicum (Panicum texanum)
Signalgrass (Brachiaria platyphylla)
Goosegrass (Eleusine indica)
Crabgrass (Digitaria spp.)
Lambsquarters (Chenopodium album)
Redroot pigweed (Amaranthus retroflexus)
Velvetleaf (Buttonweed) (Abutilon theophrasti)
Smartweed (Polygonum pennsylvanicum)
Venice mallow (Hibiscus trionum)
Purslane (Portulaca oleracea)
Florida pusley (Richardia scabra)
Spurge, annuals (Euphorbia spp.)
Carpetweed (Mollugo verticillata)

Preemergence Broadcast Rate Per Acre of PROWL in Field Corn

Soil Texture	Less than 1 1/2% Organic Matter
sands and loamy sands	0.50 to 0.75 quart
sandy loams, sandy clay loams, loams and silt loams	0.75 to 1.0 quart
silty clay loams, clay loams, silty clays and clays	1.0 to 1.5 quarts

The high rate for each texture above, where listed, should be used when heavy infestations of grass or broadleaf weeds are anticipated.

DO NOT use on peat or muck soils.

NOTE: If corn loss occurs due to weather conditions, corn, cotton, or soybeans can be replanted the same year without adverse effects. PROWL-treated land can be planted to other crops the following year.

Field Corn - Preemergence Applications of PROWL Plus atrazine¹ Mixtures

When applied as directed, tank mixtures of PROWL and atrazine will control these additional broadleaf weeds:

Common ragweed (Ambrosia artemisiifolia)
Mustards (Brassica spp.)
Prickly sida (Sida spinosa)
Black nightshade (Solanum nigrum)

Recommended tank mixtures of PROWL and atrazine will reduce competition from the following hard-to-control annual broadleaf weeds:

Cocklebur (Xanthium pensylvanicum)
Annual morningglory (Ipomoea spp.)
Jimsonweed (Datura stramonium)

¹There are several brand names for atrazine, including AAtrex^(R) - a registered trademark of Ciba-Geigy Corporation.

Preemergence Broadcast Treatment Rate Per Acre in Field Corn

Soil Texture	Less than 1 1/2% Organic Matter PROWL + atrazine 80W**
sands and loamy sands	0.50 to 0.75 qt. + 1.25 lbs.
sandy loams, sandy clay loams, loams and silt loams	0.75 to 1.0 qt. + 1.25 to 1.5 lbs.
silty clay loams, clay loams, silty clays and clays	1.0 qt. + 1.5 to 2.0 lbs.

The high rate for each soil texture above should be used when heavy infestations of grass or broadleaf weeds are anticipated.

**When using atrazine 4L, use equivalent rates. One quart of atrazine 4L equals 1.25 lbs. of atrazine 80W.

DO NOT use on peat or muck soils.

NOTE: Follow cropping restrictions on atrazine labels.

Field Corn - Preemergence Applications of PROWL Plus cyanazine
(BLADEX^(R))² Mixtures

When applied as directed, tank mixtures of PROWL plus BLADEX will control these additional broadleaf weeds.

Common ragweed (Ambrosia artemisiifolia)
Mustards (Brassica spp.)
Prickly sida (Sida spinosa)
Black nightshade (Solanum nigrum)

Recommended tank mixtures of PROWL plus BLADEX will reduce competition from the following hard-to-control annual broadleaf weeds:

Cocklebur (Xanthium pensylvanicum)
Annual morningglory (Ipomoea spp.)
Jimsonweed (Datura stramonium)

²BLADEX^(R) is a registered trademark of Shell Chemical Company.

Preemergence Broadcast Rate Per Acre in Field Corn

Soil Texture	Less Than 1 1/2% Organic Matter PROWL + BLADEX 80W***
sandy loams, sandy clay loams, loams and silt loams	0.75 to 1.0 qt. + 1.25 to 1.5 lbs
silty clay loams, clay loams, silty clays, and clays	1.0 qt. + 2.0 lbs.

***When using BLADEX 4 WDS use equivalent rates. One quart BLADEX 4 WDS equals 1.25 lbs. of BLADEX 80 WP.

The high rate for each soil texture above, where listed, should be used when heavy infestations of grass or broadleaf weeds are anticipated.

DO NOT use on peat or muck soils. DO NOT use on sands or loamy sands.

NOTE: When PROWL is used with BLADEX as directed on this label, the user can rotate from corn to other crops.

RINSE/DRAIN AND DISPOSAL PROCEDURE:

(1) Drain container into spray tank (after normal emptying) in a vertical position for 30 seconds. (2) Rinse carefully 3 times with 1 quart of water for each rinse for a 1 gallon container and drain into spray tank after each rinse. (3) Do not reuse container. (4) Bury deeply in an isolated location away from water supplies with at least 18 inches of cover.

100.2 Precautions

WARNING! Keep Out of Reach of Children.

See Side Panel For Other Warnings.

WARNING! FLAMMABLE LIQUID AND VAPOR.
Do not store near food or feed products.
Do not use, pour, spill, or store near heat or open flame.

WARNING! HARMFUL IF SWALLOWED OR INHALED.
CAUSES EYE AND SKIN IRRITATION.
Avoid contact with eyes, skin and clothing.
Avoid breathing spray mist.
Wash thoroughly after handling.
Use with adequate ventilation.
Keep container closed.

FIRST AID

If swallowed, do NOT induce vomiting. Call a physician immediately.

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Flush skin with water. Call a physician.

This product is toxic to fish. Keep out of lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as specified on this label.
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100.3 Experimental Permit Program

PROWL (R) herbicide has been extensively tested for weed control in field corn in the major corn growing areas of the United States (North Central and Northeastern states). In these states most of the corn is grown in medium to heavy textured soils (sandy loams, loams and silt loams to clay loams and silty clay loams) containing 1.5% or more organic matter. The data generated from the field tests with PROWL on field corn reflected the predominance of these soil and organic matter conditions existing in these states.

In the registered PROWL label (PROWL 4E - EPA Reg. No. 241-243 and PROWL 3E - EPA Reg. No. 241-244), the American Cyanamid Company included a restriction against use of PROWL herbicide for weed control in field corn planted in sandy soils, loamy sand soils, soils containing less than 1.5% organic matter and heavy clay soils. However, data from research trials conducted by University and Agricultural Extension personnel indicate that

PROWL herbicide applied preemergence selectively controls the annual grasses (foxtail spp., barnyardgrass, fall panicum, witchgrass, Texas panicum, signalgrass, goosegrass and crabgrass) and certain annual broadleaf weeds (lambsquarters, redroot pigweed, velvetleaf, purslane, Florida pursley, annual spurge, carpetweed and smartweed) infesting corn fields in the southeastern and southwestern states.

In the southeastern and southwestern states, the organic matter content of soils are quite often low ranging from 0 to 2%. In these states corn is grown in sandy soils and loamy sand soils. In addition, several thousands of acres planted to corn in Kansas, Nebraska, Colorado and southern Illinois are on light textured soils (sands and loamy sands) or on soils containing less than 1.5% organic matter.

The proposed Temporary Permit Program will enable the American Cyanamid Company to generate the data needed to properly evaluate the usefulness of PROWL herbicide for weed control in corn grown in sands, loamy sand soils and other soils containing less than 1.5% organic matter.

Under the proposed experimental program, 348 acres are requested for the application of 116 1/2 gallons of PROWL 4E (466 lbs. of active ingredient). The EPA has established tolerances for combined negligible residues of PROWL and its benzyl alcohol metabolite in or on the raw agricultural commodities corn grain, fodder and forage at 0.1 ppm (Federal Register, Vol. 40, No. 137 - Wednesday, July 16, 1975). In a residue study conducted at Greeley, Colorado, sandy loam soil containing 0.8 to 1.2% organic matter (Exhibit 1, Section D), less than 0.05 ppm of PROWL and its benzyl alcohol metabolite were found in corn silage, fodder and grain. The treated corn under this permit program will be allowed to enter the normal channels of trade.

It is intended that by treating the proposed acreages, data on weed control and crop selectivity will be obtained for these soil textures and organic matter categories under a wide range of grower practices.

See attached sheet for acreages and areas to be treated.

101.0 Chemical & Physical Properties

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

Summary of the Proposed Experimental Permit Program for Use of PROWL
Herbicide for Weed Control in Field Corn Planted in Light Textured Soils and
Soils Containing Less than 1.5% Organic Matter

<u>State</u>	<u>No. of Acres Requested*</u>	<u>No. of Gallons of PROWL (4E) Requested</u>
Alabama	20 (10)	7 1/2
California	10 (5)	2 1/2
Colorado	40 (20)	15
Delaware	2 (1)	1/2
Florida	10 (5)	2 1/2
Georgia	30 (15)	7 1/2
Idaho	6 (3)	2 1/2
Kansas	20 (10)	7 1/2
Maryland	2 (1)	1/2
Mississippi	14 (7)	6
Missouri	14 (7)	6
Nebraska	40 (20)	15
New Jersey	10 (5)	4
North Carolina	40 (20)	10
Oklahoma	10 (5)	4
Oregon	6 (3)	2 1/2
South Carolina	20 (10)	5
Southern Illinois	6 (3)	2 1/2
Tennessee	20 (10)	5
Texas	20 (10)	7 1/2
Virginia	2 (1)	1/2
Washington	<u>6 (3)</u> 348	<u>2 1/2</u> 116 1/2

*Number in parenthesis represents the anticipated number
of test sites per state.

103.0 Toxicological Properties

Chemical	LD ₅₀ 's or LC ₅₀ 's				
	(Acute Oral) Rat	Mallard	Bobwhite Quail	(96-hr LC ₅₀ 's)	
PROWL	1250 mg/kg	10,388 ppm	4187 ppm	0.138 ppm	0.199 ppm
BLADEx	334 mg/kg	2,400 mg/kg	400-500 mg/kg	4.9 ppm	(Channel cat-fish 8.3 ppm)
ATRAZINE	3080 mg/kg	>5,000 ppm	>5000 ppm	4.5 ppm	24 ppm

104.0 Hazard Assessment

104.1 Discussion

104.1.1 The toxicity data submitted so far is acceptable.

104.1.2 A chronic fish study is in progress. Under new Sec. 3 Regulations and the proposed Guidelines the following data is needed prior to registration of the proposed use pattern: an acute oral LD₅₀ for either mallard duck or bobwhite quail and an acute 48-hr. LC₅₀ for an aquatic invertebrate (daphnia, usually).

104.1.3 The proposed experimental program with PROWL should pose minimal hazards for non-target organisms. The proposed use pattern (in field corn) is already registered - the only difference from the registered use being an attempt to obtain data on the use of PROWL on certain soil types not previously registered. Since the use, therefore, has previously been evaluated (including the tank mixes), no undue hazards are expected. The concern, however, with PROWL's persistence in soil and water is being addressed: a chronic fish bioassay is in progress and the results will be submitted upon completion.

105.0 Conclusions

The Environmental Safety Staff has no objection to the proposed experimental permit program. However, prior to consideration of registration of the proposed use pattern, the following data must be submitted as per the new Sec. 3 Regulations and the proposed Guidelines: an acute oral LD₅₀ for either mallard duck or bobwhite quail and an acute 48-hr. LC₅₀ for an aquatic invetebrate (daphnia).

Insert the statement "Do not apply when weather conditions favor drift from target area." between "... streams or ponds." and "Do not disposal of wastes."

Norman J. Cook *WC* 2/5/76
Environmental Safety Section
Efficacy & Ecological Effects Branch