232597
RECORD NO.

108501
SHAUGHNESSEY NO.

53
REVIEW NO.

EEB REVIEW

DATE: IN 11-18-88 OUT APR 3 1989

FILE OR REG. NO 241-243

PETITION OR EXP. NO.

DATE OF SUBMISSION 6-16-88

DATE RECEIVED BY HED 11-18-88

RD REQUESTED COMPLETION DATE 3-17-89

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RD ACTION CODE/TYPE OF REVIEW 330

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) Prowl (Pendimethalin)

COMPANY NAME American Cyanamid Company

SUBMISSION PURPOSE Proposed registration of almond use

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
108501	Pendimethalin (N-(1-ethyl propyl-3, 4-dimethyl-2,6-dinitrobenzenamine)	42.3%

EEB REVIEW

Pesticide Name: Pendimethalin

100 Submission Purpose and Label information

100.1 Submission Purpose and Pesticide Use

Registration amendment for use of PROWL herbicide for preemergence weed control in nonbearing and bearing almonds.

100.2 Formulation Information

ACTIVE INGREDIENT
Pendimethalin.....42.3 %

INERT INGREDIENTS.....57.7%

Total 100.0%

(1 gal. contains 4 lbs of pendimethalin)

100.3 Application Methods,Directions, Rates

Apply PROWL uniformly in 20 or more gallons of water per acre (broadcast basis) with ground equipment.

PRECAUTIONS: Apply the spray directly to the ground beneath the trees. Do not apply to newly transplanted trees until ground has settled and no cracks are present. Do not feed forage or graze livestock in treated fields.

Recommended Broadcast Rates:

Short-term control (4 months): 2 quarts PROWL per acre
Long-term control (6-8 months): 4 quarts PROWL per acre
Long-term control (8-12 months): 6 quarts PROWL per acre

100.4 Target Organisms

PROWL herbicide controls most annual grasses and certain broadleaf weeds as they germinate, but it will not control established weeds. Destroy emerged weeds with tillage prior to an application of PROWL or use PROWL in combination with a postemergence herbicide registerd to remove existing vegetation in almonds.

100.5 Precautionary Labeling

ENVIRONMENTAL HAZARD: This product is toxic to fish. DO NOT apply directly to water. Drift and runoff from treated areas may be hazardous to fish in neighboring areas. DO NOT contaminate water by cleaning of equipment or disposal of

wastes.

101 Hazard Assessment

101.1 Discussion

Pendimethalin is currently registered for use on a variety of field crops. It is also currently registered for use on most orchard fruit and nut crops, but at a lower maximum rate (4 qts/acre) than the registration that is currently being sought. Current orchard registrations only include non-bearing crops.

Pendimethalin is very insoluble in water (0.5 ppm); it is strongly adsorbed on soil organic matter and clay and does not leach through the soil.

101.2 Likelihood of Adverse Effects to Non-Target Organisms

Pendimethalin is only slightly toxic to birds, with an LD50 of 1421 mg/kg to mallard ducks and a dietary LC50 of 4187 ppm to bobwhite quail. The most significant route of pesticide exposure for birds is through residues which occur on avian food items immediately after application. Given the fact that PROWL herbicide is applied preemergence to bare soil, its use is not expected to result in significant exposure to birds.

Pendimethalin is highly toxic to aquatic organisms, with acute LC50 values ranging from 140 ppb to 420 ppb. In order to calculate an EEC (Estimated Environmental Concentration), the scenario will be employed of a pond one acre in size supported by a 10-acre drainage basin. Prowl is to be used in an orchard situation, in an area of low rainfall generally requiring irrigation. Taking into consideration these facts, and also given the fact that pendimethalin has a low solubility in water (0.5 ppm), this pesticide is not expected to run off into aquatic systems to any great extent. Neither is drift expected to pose a problem. For the purposes of this EEC model, from 0.5 to as high as 1 percent of the applied pesticide will be expected to enter the pond (through runoff).

The resulting EEC is from 3.7 to 37 ppb (see Attachment A). Using the aquatic organism hazards trigger of 1/2 the LC50 (1/2 140 ppb = 70 ppb), this EEC is seen to be below the level at which acute adverse effects to aquatic organisms may be expected.

101.3 Endangered Species Considerations

The use of Prowl herbicide is not expected to result in hazard to endangered bird species. A low potential for exposure (the pesticide is applied to bare soil) coupled with its low level of toxicity to birds result in little

hazard to endangered avian species.

Pendimethalin is highly toxic to aquatic organisms, with acute LC50 values ranging from 140 ppb to 420 ppb. The aquatic EEC calculated in the previous section ranged from 3.7 to 37 ppb. Using the aquatic endangered species hazard trigger of 1/20 the lowest LC50 (1/20 X 140 ppb = 7 ppb), it is seen that pendimethalin levels in a small, self-contained body of water (such as in a pond) can exceed levels that may result in adverse effects to aquatic endangered species.

In EEB's judgement, the endangered aquatic species most susceptible to effects from the use of pendimethalin are those species with restricted or isolated habitats, especially those species living in shallow water or small pools.

Following is a list of species which may occur in counties in which almonds are grown. Species are either known to occur in a given county (K), or may only possibly be found there (P). Some of these species may be adversely affected by the use of pendimethalin on almonds.

El Dorado (K)	Lahontan cutthroat trout
Fresno (P)	Paiute cutthroat trout
Fresno (P)	Little Kern golden trout
Los Angeles (K)	Unarmored threespined stickleback
Madera (K)	Paiute cutthroat trout
Madera (K)	Lahontan cutthroat trout
Monterey (K)	Santa Cruz long-toed salamander
Placer (K)	Lahontan cutthroat trout
Riverside (K)	Desert slender salamander
Riverside (K)	Desert pupfish
Santa Barbara (K)	Unarmored threespine stickleback
San Bernardino (K)	Bonytail chub
San Bernardino (K)	Mohave tui chub
San Bernardino (K)	Unarmored three-spined stickleback
Santa Cruz (K)	Santa Cruz long-toed salamander
Shasta (K)	Shasta crayfish
Sonoma (K)	California freshwater shrimp
Tulare (K)	Little Kern golden trout

Attachment B lists almond-growing counties in California with the number of farms and total acreage for each county.

EEB will seek a formal consultation with the Office of Endangered Species, US Fish and Wildlife Service, to determine if this proposed use will result in jeopardy to endangered species.

101.4 Adequacy of Toxicity Data

The data are adequate to perform a hazard assessment.

101.5 Adequacy of Labeling

The Environmental Hazards labeling should be updated to read:

> This product is toxic to fish. Do not apply directly to water or wetlands (swamps, bogs, marshes, potholes). Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Do not contaminate water when disposing of equipment washwaters.

102 Conclusions

EEB has completed an assessment of the proposed amendment to the label for Prowl Herbicide to add bearing and nonbearing almonds for preemergence weed control. Based upon the available data and use information, EEB concludes that the proposed use provides for mimimal hazards to avian and aquatic organisms, but there is the potential for adverse effects to aquatic endangered species. EEB will seek formal consultation with the Office of Endangered Species, US Fish and Wildlife Service.

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Attachment A-1

EEC CALCULATION SHEET

I. For foliar application

A. Runoff

6 lbs x 0.005 (.5% runoff) x 10 (A) (from 10 A. dranage basin) = 0.3 lb (tot. runoff)

EEC of 1 lb a.i. direct application to 1 A. pond 6-foot deep = 61 ppb

Therefore, EEC = 61 ppb x 0.3 (lb) = 3.66 ppb

II. For aereal application

A. Runoff

_____ lbs x 0.6 (appl. efficiency) x 0.0 (__% run-off) x 10 (A) (10 A. d. basin) = _____ lbs (tot. runoff)

B. Drift

_____ lbs x 0.05 (5 % drift) = _____ lb (tot. drift)

Tot. loading = _____ lb + _____ lb = _____ lbs

Therefore, EEC = 61 ppb x _____ (lbs) = _____ ppb

Attachment A-2

EEC CALCULATION SHEET

I. For foliar application

A. Runoff

6 lbs x 0.01 (1 % runoff) x 10 (A) (from 10 A. dranage basin) = 0.60 lb (tot. runoff)

EEC of 1 lb a.i. direct application to 1 A. pond 6-foot deep = 61 ppb

Therefore, EEC = 61 ppb x 0.60 (lb) = 36.6 ppb

II. For aereal application

A. Runoff

_____ lbs x 0.6 (appl. efficiency) x 0.0 (__ % run-off) x 10 (A) (10 A. d. basin) = _____ lbs (tot. runoff)

B. Drift

_____ lbs x 0.05 (5 % drift) = _____ lb (tot. drift)

Tot. loading = _____ lb + _____ lb = _____ lbs

Therefore, EEC = 61 ppb x _____ (lbs) = _____ ppb

ALMOND-GROWING ACREAGE IN CALIFORNIA

	FARMS	ACRES
State total		
California	6,891	436,776
Counties		
Alameda	14	34
Amador	5	2
Butte	510	41,550
Calaveras	11	61
Colusa	118	14,411
Contra Costa	137	2,045
El Dorado	8	2
Fresno	600	33,231
Glenn	165	12,728
Kern	344	78,395
Kings	46	3,630
Lake	16	97
Los Angeles	63	522
Madera	245	24,047
Mendocino	3	(D)
Merced	1,082	66,768
Monterey	7	20
Napa	3	(Z)
Placer	39	533
Riverside	40	47
Sacramento	38	142
San Bernardino	19	47
San Diego	24	(D)
San Joaquin	948	41,795
San Luis Obispo	159	5,073
Santa Barbara	10	4
Santa Clara	16	98
Santa Cruz	6	2
Shasta	14	11
Solano	81	2,787
Sonoma	4	2
Stanislaus	1,516	72,733
Sutter	150	5,554
Tehama	87	7,037
Tulare	114	10,994
Ventura	6	11
Yolo	199	9,596
Yuba	32	2,632
All other counties	12	8

(D) Withheld to avoid disclosing data for individual farms
(Z) Less than half an acre

From: 1982 Census of Agriculture. Vol. 1, Part 5 (California).