JUN 19 1980

To: Product Manager Taylor (25)
TS-767

Through: Dr. Gunter Zweig, Chief
Environmental Fate Branch LW Garner

From: Review Section No. 1 M
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 241-243

Chemical: Pendimethalin

Type Product: Herbicide

Product Name: Prowl

Company Name: American Cyanamid Company

Submission Purpose: Add follow crop of winter wheat and barley.

EFB # 401 Action Code 305

ZBB Code: Section 3??

Date in: 03/13/80

Date Completed: JUN 19 [redacted]

Deferrals To:

☐ Ecological Effects Branch

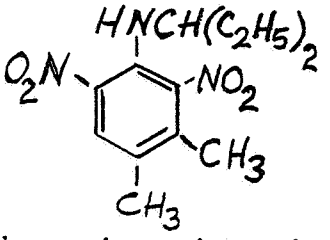
☐ Residue Chemistry Branch

☐ Toxicology Branch

1. Introduction

Chemical Name: Pendimethalin=N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine, CL 92,533, Penoxalin

Trade Name: Prowl
Percent Active Ingredient: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine=42.3%



The applicant seeks a change in registration permitting follow crop planting of winter wheat and winter barley after a Prowl spring application in field corn, cotton, soybeans, and transplanted tobacco (where registered under 24(c) ).

2. Directions for use

Environmental Hazards:

This product is toxic to fish. Keep our 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.

RINSE/DRAIN PROCEDURE: (1) Drain container into spray tank (after normal emptying) in a veritical position for 30 seconds. (2) Rinse carefully 3 times with 1 gallon of water for each rinse and drain into spray after each rinse. (3) Do not reuse container. Preferred disposal of pails; crush and recycle for scrap to a steel melting plant. If preferred disposal cannot to be accomplished, container should be crushed and/or buried at an approved dump site according to local and state regulations.

Use Rate (1 quart Prowl has 1 lb a.i.)

Preemergence Broadcast Rate Acre
of PROWL in Field Corn

| Soil Texture | 1.5% to 3% Organic Matter | More than 3% Organic Matter |
|---|---|---|
| COARSE<br>sandy loams | 1.5 qts. | 1.5 qts. |
| MEDIUM<br>loams, silt loams | 1.5 qts. | 1.5 to 2.0 qts. |
| FINE<br>silty clay loams, sandy clay loams, clay loams silty clays, clays | 1.5 to 2.0 qts. | 2.0 qts. |

Preplant Incorporated Broad Rate
Per Acre of PROWL in cotton

| Soil Texture | PROWL |
|---|---|
| COARSE<br>sands loamy sands, sandy loams | 1: to 1.5 pts. |
| MEDIUM<br>sandy clay loams, loams silt loams and silts | 1:5 to 2.0 pts. |
| FINE<br>clay loams, silty clay loams, clays | 1:5 to 3.0 pts. |

Preplant Incorporated Broadcast Rate Per Acre
Of PROWL in Soybeans

| Soil texture | PROWL |
|---|---|
| COARSE<br>sands, loamy sands, sandy loams | 1.0 to 1.5 pts. |
| MEDIUM<br>sandy clay loams, sandy clays, loams, silts, silt loams | 1.5 to 2.0 pts |
| FINE<br>clay loans, silty clay loams, clays | 1.5 to 3.0 pts. |

3. Discussion of Data

Residues of Prowl Herbicide and its Metabolite in Wheat and Barley, various authors, American Cyanamid Company, Product Development, Princeton, N.J., 10/29/79 Accession no. 241255.

Experimental Procedure

Field samples of wheat, barley, and lettuce were subjected to residue analysis at various intervals following planting as follow crops to Prowl-treated crops. Samples were analyzed for both Prowl (CL92,553), and principal metabolite CL 202,347 (4-(1-ethylpropylamino)-2-methyl-3,5-dinitrobenzyl alcohol by validated methods M-485 and M-522.1, respectively. These are gas chromatographic methods utilizing electron capture detection and having validated sensitivity of 0.05 ppm. The conditions of treatment are summarized in Table 1.

The residues of Prowl and CL 202,347 in wheat and barley after direct Prowl treatment were also studied.

Results

Residue analyses of wheat plants, sampled 41 to 231 days after planting and 195 days to 429 days after Prowl treatment, from tests conducted in Indiana, Nebraska, Iowa, California and Arizona show that preplant incorporated treatments in soybeans and cotton and preemergence treatments in soybeans and corn of Prowl at rates of 0.75 to 2.0 lb ai/A did not result in apparent residues of CL 92,553 or CL 202,347 in foliage from wheat planted as a follow crop at any of the sampling dates based on the validated sensitivity of the methods used (0.05 ppm)(Table 1).

In an Arizona test, Prowl was applied preplant incorporated in cotton at 0.5 lb ai/A and wheat was planted after cotton harvest as a follow crop. Apparent residues of CL 92,553 in wheat plants sampled 46, 60, and 74 days after planting (357,371, and 385 days after treatment, respectively) were 0.40, 0.12, and <0.05 ppm, respectively (Table 1).

Residue analyses of barley plants, sampled 64 to 129 days after planting and 321 days to 13 months after Prowl treatment, from tests conducted in Arizona and California show that preplant incorporated treatments in cotton and edible beans of Prowl at 0.75 lb ai/A did not result in apparent residues of CL 92,553 in foliage from barley planted as a follow crop at any of the sampling dates based on the validated sensitivity of the method used (0.05 ppm)(Table 1). A similar result was obtained with lettuce.

Studies in which barley or wheatwere planted immediately and directly into Prowl treated (up to 4 lb/acre/ soil showed residues in grain or straw of either mature crop to be below 0.05 ppm for both CL 92553 and CL 202, 347, except for one plot which showed ca. 0.2 ppm in wheat straw at 0, 2, and 3 lb/acre-indicating prior soil contamination. Complete results are not presented for reasons discussed below.

Conclusions

The data submitted support a conclusion that parent Powl or degradate CL 202, 347 do not accumulate in whole wheat or barley, or foliage in those crops planted as follow crops to corn, cotton, and soybeans in loam-type soils. Also, although residues in rotated tobacco was not studies, the uptake in another leafy crop-lettuce-was found to be negligible.

Prowl and CL 202, 347 do not accumulate in grain and straw of wheat and barley planted directly into Prowl-treated soil. However, this latter data is not an environmental chemistry data requirement, and was not reviewed in detail. The The greater concern for rotational crops would be accumulation of aged residues.

4. Executive Summary and Conclusion: Residues of Prowl and CL 202, 347 in whole plant or green foliage of wheat and barley planted as follow crops to corn, soybeans, and cotton, and of lettuce following edible beans, were less that the validated limit of sensitivity of 0.05 pmm at the time of harvest.

5. Recommendations

There are two objections to the data presented. First, there is no accumulation data for grain alone. Accumulation in grain may have been masked by the analysis of whole plants which could have diluted grain residues. Secondly, a study using radiolabeled Prowl was not done and the only degradate assayed for was CL 202,347 which is only one of several notable soil degradates of Prowl. It is therefore possible that other Prowl degradates accumulated in the study but went undetected under the analytical protocol. However, since past submissions on rotational crops have been approved based on the same analytical approach, these objections are not sufficient to cause rejection of the requested change in rotational crops permitted with Prowl. We therefore concur with the proposed rotational crop policy.

Henry Appleton

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Review Section #1
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