

ECOLOGICAL EFFECTS BRANCH REVIEW

Prodiamine

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

Sandoz Crop Protection Corporation has revised its proposed BARRICADE 65WG Herbicide label to include landscape ornamentals in addition to established turf. Previously proposed Directions for Use included "container grown ornamentals" which was removed from the proposed label in 1988. BARRICADE is to be used for the preemergence control or suppression of germinating grass and broadleaf weeds.

100.2 Formulation Information

Active Ingredient:

Prodiamine69.9%
N₃, N₃-Di-n-propyl-2,4-dinitro-6-(trifluoro-
methyl)-m-phenylenediamine

Inert Ingredients.....30.1%

100.3 Application Methods, Directions, and Rates

BARRICADE 65WG is a preeemergence herbicide and will not control emerged weeds. It must be activated by rainfall (0.5 inches minimum), irrigation or shallow mechanical incorporation within fourteen days of application and prior to weed germination for best results. Barricade is to be applied by broadcast boom or hand held wand at a maximum rate of 2.3 lb/A (1.5 lb a.i./A) per calendar year. It may be tank mixed with other registered herbicides. Refer to appended label for details.

100.4 Target Organisms

Annual grasses and broadleaf weeds.

100.5 Precautionary Labeling

(from proposed product label)

Do not contaminate water by the cleaning of equipment or disposal of wastes.

This product has low solubility in water. At the limits of solubility, this product is not toxic to fish. However, at

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concentrations substantially above the level of water solubility, it may be toxic to fish. DO NOT apply directly to water or areas containing standing water. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent sites. DO NOT contaminate water when disposing of equipment washwaters.

101 Hazard Assessment

101.1 Discussion

Barricade 65WG herbicide can be used for preemergence weed control for a number of ornamental species (>120), including landscaped roadsides (see attached "tolerant ornamental species"), and on established turf. Some of these ornamental species may be food producing plants (i.e. grapes, pears, etc.). Potential use may involve extensive acreage in all major regions of the country.

General label information indicates that Barricade 65WG should be applied in a minimum of 20 gallons of carrier (water or fluid fertilizer) per treated acre. Application may be made with a broadcast boom or band treatment with the spray being applied directly to the soil or grass surface. A maximum rate of 1.5 lb a.i./A /year is allowed for ornamentals; the number of applications per year was not specified on the revised label. Applications may be sequential on turf, although the total annual application may not exceed the maximum rate of 1.5 lb a.i./A.

101.2 Likelihood of Adverse Effects on Nontarget Organisms

Terrestrial Organisms

Data in EEB's files suggest that prodiamine is practically nontoxic to birds on an acute oral and a dietary basis: LD₅₀= 2250 mg/kg and LC₅₀=>10,000 ppm for the bobwhite quail. Data on oral toxicity to rats indicate that prodiamine is practically nontoxic to mammals.

Prodiamine is "relatively" nontoxic to honey bees based on a LD₅₀ of greater than 100 ppb/bee. Therefore, no significant hazard to honey bees is expected from the proposed use.

At a maximum rate of 1.5 lb a.i./A, the following maximum residue levels would be expected immediately after application:

<u>Substrate</u>	<u>Residue (ppm)</u>
short range grass	360.0
long grass	165.0
leaves and leafy crops	187.5
forage (alfalfa and clover)	87.0
pod containing seeds	18.0
fruit	10.5
direct application to soil (0.1")	33.0
direct application to water (6")	1.1

Acute hazards to nontarget terrestrial organisms (including endangered species) are not expected from the proposed use since the estimated environmental concentrations (EEC) are less than 1/5 and 1/10 LC₅₀ for the bobwhite quail.

Chronic effects to terrestrial organisms cannot be assessed at this time due to lack of data. However, chronic hazards to avian and mammalian species may be a potential problem due to the probability of high exposure and sequential applications in landscaped and turf environments. This exposure can be reduced through rapid incorporation of Barricade after application. In addition, prodiamine can persist in the soil for extended periods of time (projected half-life of prodiamine was found to be 230 days in soil dissipation study on turf).

Aquatic Organisms

Based on the results of acute toxicity studies to freshwater fish and invertebrates (LC₅₀ > 552 ppb for bluegill; LC₅₀ > 829 ppb for rainbow trout; and LC₅₀ > 658 ppb for daphnia), prodiamine is not expected to pose a significant acute hazard to freshwater organisms at its limit of solubility in water (13 ppb).

Chronic toxicity to aquatic organisms cannot be assessed at this time due to lack of data. However, there is a potential for prodiamine to be carried on suspended soil particles in a runoff event to adjacent bodies of surface water. Once there, it would be expected to remain in the sediment and dissipate/degrade very slowly. In this case, the potential for adverse chronic effects to aquatic organisms is high.

Plant Toxicity

Adverse effects of the use of prodiamine on nontarget plants is not expected due to its low volatility (2.5×10^{-8} mm at 25°C), low solubility in water (13 ppb), and the proposed method of application (ground equipment).

101.3 Endangered Species Considerations

Use of prodiamine is not expected to adversely affect endangered avian or aquatic species on an acute basis. However, potential to adversely affect these species on a chronic basis exists. Adverse effects to nontarget plants are not expected.

101.4 Adequacy of Toxicity Data

Data are sufficient to assess the acute risks of the use of prodiamine to nontarget avian, aquatic, honey bee, and plant species.

Although data are not sufficient to assess chronic risks to terrestrial and aquatic species, potential for adverse effects from ornamental use is minimal due to the minor acreage involved.

Data are not sufficient to assess the chronic risks of the use of prodiamine on turf to nontarget organisms. A chronic daphnia study and a fish early life stage study have already been requested by EEB (Tom Bailey, 8/24/90). An avian reproduction study is also required at this time due to the fact that birds may be subjected to continued exposure to prodiamine or its major metabolite degradation products. A risk assessment for the use of prodiamine on turf cannot be completed until these studies have been submitted.

101.5 Adequacy of Labeling

The following environmental hazard labeling should be required: Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

It should be noted that the proposed label allows for use on ornamental tree species only (including ornamental food producing trees). The proposed label must clearly state that Barricade may not be used on commercial food producing trees; otherwise, these species must be dropped from the label. In addition, the number of applications allowed per year for landscape ornamentals needs to be specified on the proposed label.

103 Conclusions

EEB has reviewed the proposed registration for Barricade 65WG on landscape ornamentals and established turf. Use of

Barricade is not expected to adversely affect nontarget (including endangered) avian or aquatic organisms on an acute basis. Risk to nontarget bee or plant species is not expected due to the reasons listed in Section 101.2.

Although EEB is unable to assess the chronic terrestrial or aquatic risks at this time, use of prodiamine on landscape ornamentals should pose minimal risk due to the minor acreage involved. A risk assessment for the use of prodiamine on turf cannot be completed at this time due to the lack of data listed in Section 101.4

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