3/11/91

Ecological Effects Branch
Section 18
Emergency Exemption Request

CHLOROTHALONIL

100.0 Section 18 Application

100.1 Nature and Scope of Emergency

The New Jersey Department of Environmental Protection, Pesticide Control Program requests and exemption to use Bravo 720F and 90DG fungicide (chlorothalonil) on blueberries to control anthracnose. This disease is caused by the fungus Colletotrichum gloeosporioides. Other fungicides are either ineffective against heavy infestations of anthracnose fruit rot or are not labeled for this use.

100.2 Target Organism

Fungus — Colletotrichum gloeosporioides

100.3 Date and Duration

The Section 18 exemption will be from March 15 - December, 1991.

100.4 Application Rate and Method

Bravo 720 is to be applied at the rate of 3.0 pt/A or 2.25 lbs a.i./A (54% a.i). The application rate of Bravo 90DG (90% a.i. dissolvable granular) was not provided but it is expected to be 2.5 lbs/A, as this will result in the same rate of 2.25 lbs a.i./A. There is a maximum of three applications to be applied by aircraft of ground sprayers. Growers will be instructed to apply Bravo only when they are advised to do so. They will be advised when treatments are needed, at what use rates, etc., during the entire production season in the Blueberry Bulletin.

100.5 Treatment Areas

It is anticipated that a maximum of 7,600 acres will be treated. Most of the acreage treated will be in Atlantic County (4,000 A), and Burlington County (2,900 A). All other counties treated will total 700 acres. If the maximum

use rate of 3 pts/A or 2.25 lbs a.i./A is used over the entire production area, a total of 8,550 gal or 51,300 lbs A.I will be used.

100.6 Precautionary Labeling

No labeling was provided.

101.0 Hazard Assessment

101.1 Likelihood of Adverse Effects to Non-Target Organisms

Toxicity

Chlorothalonil is practically non-toxic to mammals and birds on an acute basis. Its degradate, SD-3701, is slightly to moderately toxic.

Species	Product	Test Type	Results
Rat	technical	LD_{50}	>10,000 mg/kg
Mallard	"	LD_{50}	> 4,640 mg/kg
Mallard	"	LC_{50}	21,500 ppm
B.W. Quail	"	LC_{50}	>10,000 ppm
B.W. Quail	degradate	LC_{50}	1,746 ppm
Mallard	"	LC_{50}	2,000 ppm
Mallard	"	LD_{50}	158 mg/kg

Avian reproduction studies using Chlorothalonil technical produced NOEL's = 10,000 ppm in mallards and = 1,000 ppm in bobwhite quail. The degradate showed reproductive effects at lower concentrations. The NOEL's for mallards and bobwhite quail are 50 ppm and 100 ppm, respectively.

Chlorothalonil is very highly toxic to freshwater fish and invertebrates, estuarine fish, and mollusks. It is highly toxic to shrimp. Its degradate, SD-3701 is slightly toxic to freshwater organisms.

Species	Product	Test Type	Results
R. Trout	technical	LC_{50}	47 ppb
Bluegill	"	"	51 ppb
D. Magna	"	"	70 ppb
D. Magna	degradate	"	26 ppm
Bluegill	"	"	16 ppm
Sheepshead minnow	technical	"	32 ppb
Pink shrimp	"	"	165 ppb
Crassostrea virginica	"	EC_{50}	3.6 ppb

Aquatic reproduction studies using chlorothalonil produced MATC values > 3 < 6.5 ppb and > 39 < 79 ppb for fathead minnows and D. magna, respectively.

Terrestrial Residues

The maximum residue level after one spraying with 2.25 lbs ai/A is 290 ppm on leaves, and 15 ppm on fruit such as blueberries. Based on crop residue studies, the degradate DS-3701 will make up on average, 7.5% of the applied parent. Therefore the maximum degradate concentration expected on blueberry foliage could be 22 ppm (290 ppm / .075). Dissipation half-lives of 8 days for chlorothalonil and 6 days for DS-3701 were extrapolated from the following residue information: Crops treated with 3.75 lbs. ai/A had residues of 3 ppm and 0.26 ppm for chlorothalonil and DS-3701, respectively after 59 days.

The previous information was used in a Fate computer program which calculates the daily accumulated pesticide residues resulting from multiple applications. After 3 applications with a ten day interval, chlorothalonil's maximum and average accumulated residue concentrations on leaves are 463 ppm and 269 ppm, respectively. DS-3701's maximum and average accumulated residue concentrations on leaves are 31 ppm and 17 ppm, respectively.

Aquatic Residues

Chlorothalonil is insoluble in water (.6 ppm) therefore, a 1% runoff will be used in the EEC calculations. The EEC is calculated according to a 6 ft. deep, 1 A. pond with a 10 A. drainage basin.

Runoff

2.25 lbs. a.i./A. x .6 application efficiency x .01 x 10 A.

= .135 lbs total runoff

Drift

2.25 lbs. a.i./A. x .05 5% drift = .112 lbs. total drift

EEC

Total loading = .135 lbs. runoff + .112 lbs. drift = .25 lbs.

Therefore, EEC = 61 ppb constant x .25 lbs. = 15 ppb

Risk Assessment

Terrestrial

The maximum expected residue concentration of DS-3701 (31 ppm) on leaves is not expected to exceed the endangered species concern level (1/10 LC_{50}) for upland game (175 ppm) or waterfowl (200 ppm) species. DS-3701 is also below the presumption of risk (1/5 LC50) for nonendangered avian species (upland game - 350 ppm, waterfowl- 400 ppm) species. Avian reproductive effects are not likely to occur because the EEC is below the NOELs for mallards (50 ppm) and bobwhite quail (100 ppm).

The maximum expected residue concentration of chlorothalonil on leaves (463 ppm) does not exceed the avian endangered (1/10 LC50; mallard = 2,150 ppm, bobwhite quail = 1000 ppm) or nonendangered (1/5 LC50) species concern levels. No reproductive effects are likely to occur.

Aquatic

Chlorothalonil's maximum aquatic EEC of 15 ppb exceeds the endangered species concern level (1/20 LC_{50}) for rainbow trout (1/20 LC50 = 2.3 ppb), bluegill (1/20 LC50 = 2.6 ppb) and D. magna (1/20 LC50 = 3.5 ppb). The EEC also exceeds the ecological concern level for nonendangered species (1/10 LC_{50}) for rainbow trout (1/10 LC50 = 4.7 ppb), bluegill (1/10 LC50 = 5.1 ppb), Daphnia magna (1/10 LC50 = 7.0 ppb), sheepshead minnow (1/10 LC50 = 3.2 ppb) and mollusks (1/10 LC50 = .36 ppb).

Aquatic reproductive effects are likely to occur. The EEC exceeds the MATC values for fathead minnows.

Residue concentrations of DS-3701 are not expected to exceed the endangered species or the ecological concern levels for aquatic organisms.

Environmental Fate Information

Chlorothalonil degrades at a moderate rate in soils, with a half-life up to 30 days. It is slightly mobile to mobile in most soils. SD-3701 is persistent in soil, and there is no dissipation within 90 days.

Chlorothalonil is insoluble in water (.6 ppm) and is stable to hydrolysis for 30 days in water. Its half-life in sediment is 5 to 15 days.

Chlorothalonil and DS-3701 bioaccumulate in bluegill sunfish. Levels of chlorothalonil in tissues can reach 3000x the water concentration. DS-3701 can bioaccumulate up to 250x. The average concentration of chlorothalonil in the pond scenario throughout a 30 day application period is 15 ppb. Even if chlorothalonil bioaccumulated less than the previously stated maximum level, it could cause secondary poisoning to piscivorous fish and avian species.

102.0 Endangered Species Considerations

Chlorothalonil and its degradate DS-3701 do not exceed endangered species concern levels for terrestrial species. However, chlorothalonil's aquatic EEC does exceed the endangered species concern level. There are no endangered aquatic species in Burlington or Atlantic Counties where 6,900 acres of the proposed 7,600 treatment acres are located. The only endangered aquatic species in New Jersey is the shortnose sturgeon which is found in the lower sections of large rivers and in coastal marine habitats. It is not expected to be adversely affected by the use of chlorothalonil according to this emergency exemption.

103.0 Adequacy of Toxicity Data

The available data were adequate to assess the potential hazard of this proposed Section 18.

104.0 Adequacy of Labelling

Labeling should read as follows:

Environmental Hazards

This product is toxic to fish, aquatic invertebrates, and marine/estuarine organisms. Do not contaminate water when disposing of equipment washwaters. Do not apply directly to water, swamps, wetlands, bogs, marshes and potholes.

105.0 Conclusion

Chlorothalonil is very highly toxic to freshwater fish, aquatic invertebrates, and estuarine/marine organisms. The EEC from one application exceeds the ecological concern level (1/10 LC50) for nonendangered aquatic species. Adverse effects to aquatic organisms may occur especially since there are multiple applications, and chlorothalonil is stable in soil (available for runoff) and water. Avian species and endangered species in New Jersey are not expected to be adversely affected from this emergency exemption.

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