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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, DC 20460

OFFICE OF
PESTICIDES AND
TOXIC SUBSTANCES

March 14, 1989

MEMORANDUM

SUBJECT: Biological Evaluation of Public Interest Documentation Submitted by Griffin Corporation in Support of Sulfluramid Cockroach Bait Stations (Raid® Roach Controller II).

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TO: Phil Hutton, Product Manager
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THRU: E. David Thomas, PhD
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Biological and Economic Analysis Division (H 7503-C)

I have reviewed the Public Interest Documentation submitted by Griffin Corporation in support of sulfluramid cockroach bait stations (Raid® Roach Controller II) and am offering the following discussion and conclusions for your consideration.

Sulfluramid is a delayed action toxicant that belongs to a new class of insecticides known as the flouroaliphatic sulfonamides. Sulfluramid kills insects by interfering with cellular respiration via the uncoupling of oxidative phosphorylation. The applicant is proposing conditional registration of a 1.0 percent sulfluramid bait station for control of cockroaches in homes.

The applicant makes the following claims for this formulation:

-Less repellant than other insecticides (e.g. hydramethylnon, chlorpyrifos, and propoxur)

-Faster acting than hydramethylnon

-Most effective roach bait formulation

In support of these claims the applicant has submitted several laboratory efficacy studies and a summary from a field evaluation conducted in apartments in Mexico City. In general, the submitted efficacy studies appear to support these claims. A laboratory study conducted by Reid, Bennett, and Barclay (1989) demonstrated 100% mortality of German cockroach nymphs exposed to dietary concentrations ranging from 62.5 to 1000 ppm. These authors also demonstrated that sulfluramid in baits was nonrepellent to German cockroaches (as opposed to hydramethylnon which was slightly repellent) and inferred that sulfluramid was faster acting than hydramethylnon based on the observed bait repellency of hydramethylnon and the results of topical studies conducted with hydramethylnon and sulfluramid. In another laboratory study, sulfluramid was less repellent and achieved greater efficacy than three alternative formulations. The results of this study are summarized in Table 1 (Dykstra, 1989).

Table 1. Acceptability and mortality of adult german cockroaches exposed to selected insecticidal baits.

Toxicant	% Mortality after 7 days	% of total consumption
Sulfluramid (1.5%)	100	26.4
Hydramethylnon (1.65%)	76	14.8
Chlorpyrifos (0.5%)	99.7	15.9
Propoxur (1.0%)	58	17.6

In a field efficacy study conducted in apartments in Mexico City, bait applications of sulfluramid resulted in greater population reductions of cockroaches than did bait applications of hydramethylnon or chlorpyrifos baits. The results of this study are summarized in Table 2 (Hainze, 1988).

Table 2. Cumulative mortality of cockroaches exposed to insecticidal baits in Mexico city apartments (ten replicates per treatment).

Toxicant	% Cumulative Mortality at		
	15 days	30 days	60 days
Sulfluramid	70	67	76
Hydramethylnon	51	65	60
Chlorpyrifos	51	53	53

In another study, the efficacy of aged bait (60 and 84 days old) against German cockroaches in the laboratory was found to be nearly identical to that of fresh bait (Owens and Yonker, 1988).

Although the data submitted by the applicant appears to support the claims of sulfluramid's superior efficacy relative to the alternatives, my review of other efficacy studies in the literature leads me to suspect that the actual performance differences between sulfluramid, hydramethylnon, and chlorpyrifos may not be significant. For example efficacy tests in residential apartments with hydramethylnon baits resulted in 77% reduction in german cockroach populations one month after treatment and 97% reduction 6 months after treatment (Milio et al, 1986). In a similiar study, Bennett and Runstrom (1984) observed population reductions of 55% after 14 days, 74% after 28 days, and 86% after 56 days following treatment with hydramethylnon baits and 73%, 86%, and 88% respectively after 14, 28, and 56 days following treatment with chlorpyrifos baits. In laboratory studies with fresh and aged (6 to 10 months old) hydramethylnon baits, 100% mortality was observed in German cockroaches after 7 days (Milio et al, 1986).

Additionally, the applicant did not provide any comparative efficacy data demonstrating how well sulfluramid performs relative to borax, boric acid, lead arsenate, and trichlorfon cockroach baits.

Conclusions

In light of the previous discussion, sulfluramid cockroach baits appear to be equal to or better than the currently registered cockroach baits for control of German cockroaches. Although the registrant has presented data which supports their claims of superior efficacy, my review of other efficacy studies in the literature leads me to suspect that the differences between sulfluramid, hydramethylnon, and chlorpyrifos may not be significant.

However, I do not believe that this sulfluramid cockroach bait satisfies the basic criteria for a Public Interest Finding. Specifically I do not believe that there is a need for a new chemical that is not being met by other currently registered pesticides. The available data indicates that hydramethylnon and chlorpyrifos baits are efficacious and are widely available and in use by consumers. Additionally there are several additional active ingredients found in registered cockroach baits including propoxur, borax, boric acid, lead arsenate, and trichlorfon. Refer to Table 3 for a partial list of registered cockroach bait products.

Table 3. Product Data on Alternative Cockroach Bait Formulations to Sulfluramid.

Active Ingredient	Registration Number	Percent AI	Product type	Product Name	Registrant Name
Borax	395-33	5.4%	[redacted]	Magi-kil jelly	Lethelin products Co.Inc.
Boric acid	602-169	2.0%	Granular	Purina roach bait	Ralston Purina
	3314-2	40%	Tablets	Eatons 4 the roach tablets	JT Eaton Co.
	8346-1			Amozol roach kil	Ream W. Horace
	47056-4	51.0%	[redacted]	Superior roach and ant gel	H. R. McLane & Co. Inc.
	51707-1	52.0%	Paste	It works roach killing paste	It works Inc
	3	52.0%	Bait station	It works roach killing stations	"
	5????-?	3?.?%	Paste	MRF 2000 Magnetic Roach food	Blue Diamond Mfg.
Chlorpyrifos	475-254	0.5%	Bait station	Black flag roach control sys.	Boyle-Midway
	4822-153	0.5%	Bait station	Raid buggy whip roach bait	SC Johnson
	6248-17	0.5%	Granular	Black magic roach bait	Black magic Co.
	10370-49	0.5%	Granular	Ford's roach bait	Ford's Chemical & Srvc Co
	10370-4457	0.5%	Granular	Ford's roach and ant bait	Ford's Chemical & Srvc Co
	34149-3545	0.5%	Granular	Bug house roach & ant bait	Bug house Chemical Store
	55779-1	0.5%	Paste	Impact Roach bait	M&M Products Co
Hydramethylnon	241-293	1.65%	Bait Station	Amdro Roach Control Stations	American Cyanamid Co.
	1730-66	1.65%	Bait Station	Combat Roach Control System	American Cyanamid Co.
	1730-67	1.65%	Bait Station	Maxforce Roach Control System	American Cyanamid Co.
	1730-71	0.9%	Bait Station	Combat Roach Control Sys. II	American Cyanamid Co.
Lead arsenate	60-1	16.2%	Bait station	Gator Roach Hives	Desoto Chem Co, Arcadia, FL
Propoxur	475-172	2.0%	Bait station	Black flag roach bait	Boyle midway
	506-130	2.0%	Bait station	Antchek roach trap	Walco-link
	3125-121	2.0%	Granular	Baygon 2% bait insecticide	Mobay
	3941-24	2.0%	Bait station	Echols roach and ant killer	Athena corporation
	8730-35	10.0%	Bait station	Lure & kill roach & ant bait	Hercon Laboratories Corp.
	52115-2	2.0%	Bait station	Magikil roach trap w/ Baygon	Columbia Specialty Co.
Trichlorfon	8612-105	5.0%	Granular bait	B & G ban bug bait	B & G Company

INFORMATION WHICH MAY REVEAL THE IDENTITY OF AN INERT INGREDIENT IS NOT INCLUDED

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