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Date Out EFB: JUN 11 1980

Japanese Field

To: Product Manager 23 Garner
TS-767

From: Dr. Willa Garner III
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 239-EULN, EUUO

Chemical Thiobencarb

Type Product: Herbicide

Product Name: Bolero 8EC, Bolero 10G

Company Name: Chevron

Submission Purpose: Registration on rice

ZBB Code: _____ ACTION CODE: 162 and 162

Date in: 01/23/80 EFB # 369 and 370

Date Completed: JUN 11 1980

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

(1)

3.1 Benthiocarb: Studies on Residue Level and Behavior in Selected Irrigation Creeks in Agricultural Areas in Saga Pref., Southwestern Japan. Ishikawa, K., T. Oishi and K. Kojima. Kumiai Chemical Industry Co., Ltd. Section of Residue Analysis, Toxicological Laboratory, Life Science Research Institute. March, 1975. Acc. #241476, Tab 2.2.

Procedure

Ten sampling stations in a rice cultivation area of Saga Prefecture, Kyushu, Southwestern Japan were established for analysis of benthiocarb residues in creek water (Fig. 1) from March through November, 1974. The study covered 80 hectares of rice fields in the Kawazoe-cho district, with an estimated water volume in the creeks under study of 80-90 metric tons. Creeks serve as storage areas for irrigation water until May, when water is pumped from the creeks into rice fields. Creeks resemble large ponds during the storage period.

Station No. 1 was at the upper-most stream of the main waterway, and Station No. 2 was located at the upper-most point of the big creek where the volume of flowing water was maximum (water flows were not quantified). Stations 6, 7, and 8 were located at the western-most, center, and eastern-most points, respectively, on the creek connecting East and West of Fuktomi district. Station 9 was located at the southern-most point of this creek, and Station 10 was located at the end of the irrigation waterway, the final outlet of irrigation water to the Hayatsue River (see Fig. 1 for the location of these and other sampling stations). Irrigation water is introduced to the study area through three channels; the main irrigation waterway (A in Fig. 1); from the big creek (B in Fig. 1) and from the big creek running east of the study area (C in Fig. 1). Irrigation water flows through Stations No. 5, 7, and 9, discharging into the Hayatsue River at Station No. 10.

Water samples from each of the 10 stations were taken 14 times from March 4 through November 29, 1974. One liter samples were collected 50 cm below the surface at each station. Benthiocarb (source and purity not specified) treatment in the study area occurred primarily (quantitative data not provided) from June 28 through July 2. Application was 7% granules at a rate equivalent to 30 kg/hectare in paddy fields flooded with 5 cm water. 1.9 lb ai/A

Methodology

Benthiocarb in water was determined by gas chromatography equipped with electron capture detectors, after extraction with dichloromethane. Recoveries of benthiocarb from water ranged from 98.1 to 98.7% with a level of detectability of 0.05 ppb.

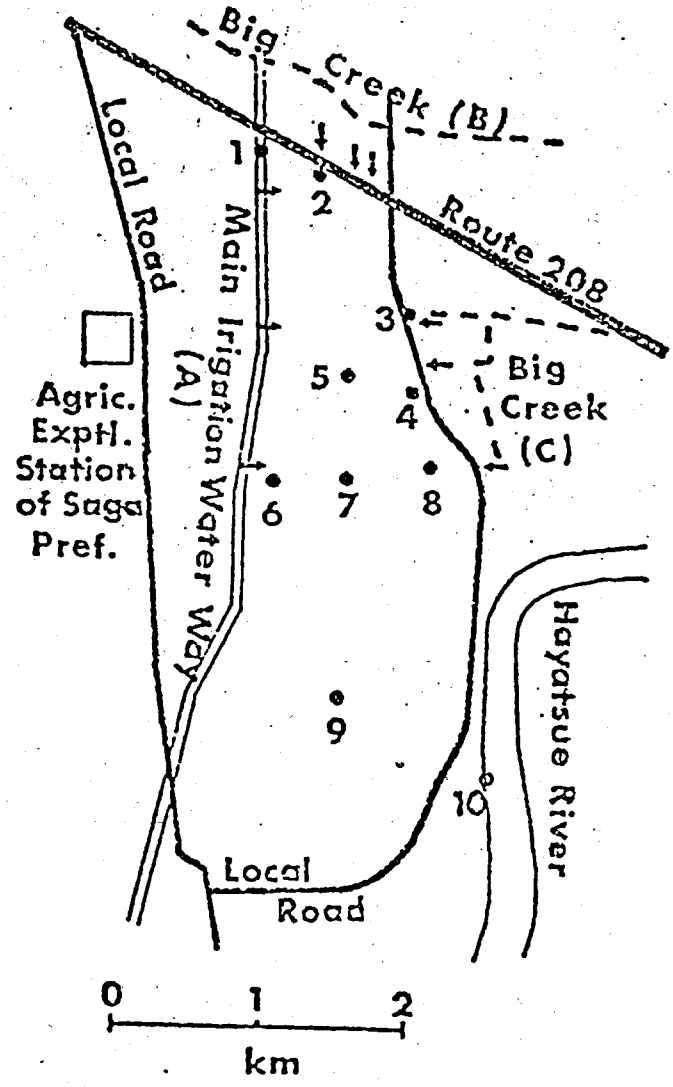

Figure 1. Sampling station is Saga County, Saga Prefecture, Kyushu, Southwestern Japan

Results

Benthiocarb residues in water collected at the 10 sampling stations from March 4 through November 29, 1974 are presented in Table 1. Maximum residues (0.04 ppm, Station 3) were found on July 1, which correlated with benthiocarb treatment in the study area from June 28 through July 2.

Dissipation rate constants and half-lives of benthiocarb in water were calculated, using the July 1st levels as the starting concentration, and ending with levels found on September 9. These results are presented in Table 2, and show an average half-life of 8.8 days.

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Table 1. Benthiocarb concentration in water collected at the sampling stations in agrucultural areas in Saga Prefecture, Southwestern Japan

Station #	Residue in Water (ppm)													
	Mar. 4	Apr. 22	June 3	June 24	July 1	July 8	July 15	July 22	July 29	August 5	August 12	August 19	Sept. 9	Nov. 29
1	n.d.	n.d.	n.d.	0.00075	0.00166	0.00710	0.00188	0.00018	0.00064	0.00006	-	n.d.	n.d.	0.00009
2	0.00010	0.00006	0.00007	0.00228	0.00900	0.01400	0.00340	0.00078	0.00051	0.00024	0.00021	0.00025	n.d.	0.00018
3	-	0.00006	-	-	0.04050	0.01440	0.00510	0.00330	0.00205	0.00097	0.00050	0.00071	0.00013	-
4	0.00019	0.00008	0.00011	0.00130	0.03200	0.01620	0.00640	0.00370	0.00164	0.00092	n.d.	0.00088	0.00014	0.00018
5	0.00016	0.00005	0.00008	0.00132	0.02650	0.01800	0.00735	0.00401	0.00162	0.00107	0.00064	0.00085	0.00005	0.00020
6	0.00011	n.d.	0.00011	0.00132	0.03780	0.00800	0.00402	0.00220	0.00220	0.00108	0.00079	0.00078	0.00009	0.00012
7	0.00013	0.00006	0.00009	0.00103	0.03150	0.01860	0.00730	0.00385	0.00168	0.00115	0.00084	0.00097	0.00007	0.00010
8	0.00012	0.00007	0.00012	0.00130	0.02500	0.0830	0.00700	0.00360	0.00144	0.00107	0.00069	0.00078	0.00009	0.00012
9	0.00012	0.00006	0.00019	0.00117	0.00810	0.01860	0.00800	0.00450	0.00198	0.00110	0.00160	0.00100	0.00006	0.00016
10	0.00020	0.00007	0.00010	0.00100	0.02150	0.00579	0.01030	0.00148	0.00285	0.00080	0.00160	0.00053	n.d.	0.00025

Table 2. Rate constants & half-life periods of benthiocarb dissipation from July 1st through September 9th at 10 sampling stations.

Station #	Rate constant (K)	Half-life period (day)
1	0.1068	6.5
2	0.0926	7.5
3	0.0780	8.9
4	0.0742	9.3
5	0.0860	8.1
6	0.0836	8.3
7	0.0822	8.4
8	0.0793	8.7
9	0.0717	9.7
10	0.0551	12.6

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Conclusions

Benthiocarb residues in creek water decline rapidly (average half-life of 8 days) following application of benthiocarb (7% granules, 30 kg/hectare in rice paddy fields) in the rice culture study area. Data are not sufficient to determine the relative importance of dilution versus biological or physico-chemical degradation in the disappearance of benthiocarb. Flow rates in the creek, and between the creek and the surrounding rice paddies, were not provided. Similarly, rainfall and other meteorological data over the study period were not reported.

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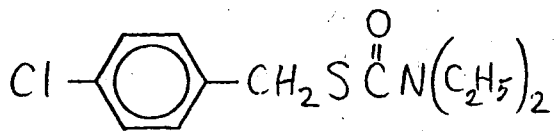
1. INDRODUCTION

1.1 This is a request for the registration of the use of thiobencarb on rice. Two formulations of the active ingredient are involved and are designated by the product names Bolero 8EC and Bolero 10G.

1.2 This is a resubmission for this use since our file contains a review of 239-EULN, EUUO dated April 22, 1976. In that review, we concurred with the proposed use.

1.3 The additional data sent in with this resubmission was reviewed for 6(a)(2) purposes.

1.4 Structure and chemical name



S-[(4-chlorophenyl)methyl]diethylcarbamothioate

2. DIRECTIONS FOR USE

2.1 See our review of 239-EUUO, EULN dated April 22, 1976.

2.2 With regard to the labels included with this resubmission, the 8EC contains a 6 month rotational crop restriction but the 10G does not.

3. DISCUSSION OF DATA