

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JUN 09 1983

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

To: Henry Jacoby  
Product Manager 21  
Registration Division (TS-767)

Thru: Raymond Matheny, Head, Section 1 *RW*  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769)

Thru: Clayton Bushong, Chief *CB*  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769)

Subject: Estimated Environmental Concentrations (EEC) for Nemacur  
(EPA Reg. # 3125-283/3125-286)

The Ecological Effects Branch (EEB) requested an EEC for fenamiphos from the Exposure Assessment Branch (EAB) on April 21, 1983. The subject document (see attachment) was hand delivered to my office on June 7, 1983. The SOP requires that all registration actions be forwarded to this Branch via the HED tracking system.

If you want this information integrated into a hazard assessment for the conditional registration of Nemacur on tobacco and nonbearing deciduous fruit trees please forward your request to MSS. Your help in expediting this matter would be greatly appreciated as we would like to complete this action as soon as possible.

*Charles A. Bowen*

Charles A. Bowen  
Fishery Biologist  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769)

cc: L. Touart

(1) Attachment - EAB Estimated Environmental Review of 3125-283, 3125-237,  
3125-236

*1 page w/attachment (7 pages)*

Shaugh. No. 100601

EAB Log Out Date: MAY 20 1983

Init.: [Signature] for RVM

To: Jacoby/Beavers  
Product Manager #21  
Registration Division (TS-767)

From: Carolyn K. Offutt [Signature]  
Head, Environmental Processes and Guidelines Section  
Exposure Assessment Branch, HED (TS-769)

Attached, please find the estimated environmental concentration review of:

Reg./File No.: 3125-283, 3125-237, 3125-236

Chemical: Fenamiphos

Type Product: I

Product Name: Nemacur

Company Name: \_\_\_\_\_

Submission Purpose: EEC

ZBB Code: other

Action Code: 316

Date In: 4/27/83

EFB#: 3333-3335, 3366- 3368

Date Completed: \_\_\_\_\_

TAIS (Level II) \_\_\_\_\_ Days

Deferrals To: \_\_\_\_\_ 61 \_\_\_\_\_ 10

\_\_\_\_\_ Ecological Effects Branch

\_\_\_\_\_ Residue Chemistry Branch

\_\_\_\_\_ Toxicology Branch



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MAY 20 1983

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

TO: Charles A. Bowen  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769)

SUBJECT: REC's for Fenamiphos (Nomacur) EPA Registration No.  
3125-283/3125-286

THRU: Carolyn K. Offutt, Chief (10. . . 1. 4. 77)  
Environmental Processes and Guidelines Section  
Exposure Assessment Branch  
Hazard Evaluation Division (TS-769)

You requested on April 20, 1983, estimated environmental concentrations (REC's) for two different formulations (3EC and 10G/15G) of Fenamiphos in both lentic and lotic environments. The models we use do not currently differentiate the amount of runoff from various formulations. In general, the runoff model inputs use the application rate (lb a.i./A) of the active ingredients in the formulation.

As per the discussion in my office we agreed (1) to use the lowest and highest calculated average runoff values per inch of rainfall based on Mobay's runoff study (pesticide petition #26849) and (2) to provide exposure analyses via EXAMS50 (steady-state simulation) model using four different drift loads (DRFLD) which are calculated from the lowest and the highest average runoff values after application of fenamiphos at the rate of 20 lb a.i./A and 6 lb a.i./A.

Runoff Calculation

The calculated runoff values based on Mobay's study (petition #26849) and the input data for the EXAMS50 drift load (DRFLD) are shown in Table 1.

The results of the Exposure Analysis Modeling System (EXAMS50) for fenamiphos in the lentic and the lotic environments are shown in Table 2 and 3 respectively.

Under the steady-state assumption of the EXAMS50 model, the maximum concentration in the water and in the sediment is a linear function of the amount of input load, entered as drift, to the small pond of 15 hectares and small river flowing adjacent to a crop field.

The maximum concentrations in the lentic water are 1.6 ppt and 0.65 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.49 ppt and 0.19 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The maximum concentrations in lentic sediment deposits on a dry weight basis are 1.4 ppt and 0.55 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.17 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The recovery time (2 half-lives or 75% removal) is 12 hours and self-purification (5 half-lives or 97% removal) is 64 hours in all four cases of the input load.

The maximum concentrations in the lotic water are 0.02 ppt and 0.0086 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.0065 ppt and 0.0026 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The maximum concentrations in the lotic sediment deposits on a dry weight basis are 0.00062 ppt and .00025 ppt for 1% and 0.4% runoff at 20 lbs a.i./A and 0.00019 ppt and 0.000074 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The recovery time (2 half-lives or 75% removal) is 12 hours and self-purification (5 half-lives or 97% removal) is 2 hours in all four cases of the input load.

As per our discussion you agreed with me that the fenamiphos (Nemacur) registration package has the following important data gaps: (1) rate of photolysis, (2) rate of neutral hydrolysis, (3) rate of oxidation, (4) octanol-water partition ratio, (5) runoff experimental data for the soil-incorporated pesticide (6) all environmental fate and process data pertaining to the major metabolites or degradation products (sulfoxide and sulfone).

I hope that you will be able to use these estimated EEC's from the EXAMS50 steady-state version in the final phase of the ecological effects part of the fenamiphos Registration review.



P.R. Datta, Chemist  
Exposure Assessment Branch/HED (TS-769)

TABLE 1

Daily Runoff Data for fenamiphos (Nemacur)  
 from Mobay's Petition #26849

Application Rate	Ranges of Average Runoff Values *	
	0.4%	1.0%
20 lb/A	0.08 lb/A/day 1.50 x 10 <sup>-3</sup> kg/A/hr (EXAMS50)	0.2 lb/A/day 3.76 x 10 <sup>-3</sup> kg/A/hr (EXAMS50)
6 lb/A	0.024 lb/A/day 0.45 x 10 <sup>-3</sup> kg/A/hr (EXAMS 50)	0.06 lb/A/day 1.13 x 10 <sup>-3</sup> lg/A/hr (EXAMS50)

\* Based on the runoff study using three different soils (sandy loam, silt loam and organic silt loam). After 37 days of treatment, the percent of the applied Nemacur in the runoff water for per inches of rainfall (irrigation) was 0.4 for sandy loam, 1.0% for silt loam, 0.76% for organic silt loam. The runoff water was collected at 10 ft from the base of treated plots with a slope of 8.3%. Therefore, the range of average runoff values was assumed to be 0.4% to 1.0% of the applied Nemacur.

TABLE 2

Exposure Analysis Modeling System (EXAMS50) for fenamiphos (NEMACUR) in the Lentic (Pond) Environment

EXAMS50 Parameters	Application Rates			
	20 lb a.i./A		6 lb a.i./A	
	Drift Load (DRFLD)		Drift Load (DRFLD)	
	low runoff	high runoff	low runoff	high runoff
	$1.5 \times 10^{-3}$ kg/hr	$3.76 \times 10^{-3}$ kg/hr	$0.45 \times 10^{-3}$ kg/hr	$1.13 \times 10^{-3}$ kg/hr
Maximum conc. in water	$6.5 \times 10^{-7}$ mg/l	$1.6 \times 10^{-6}$ mg/l	$1.9 \times 10^{-7}$ mg/l	$4.9 \times 10^{-7}$ mg/l
Maximum conc. in sediment deposit (dry wt)	$5.5 \times 10^{-7}$ mg/kg	$1.4 \times 10^{-6}$ mg/kg	$1.7 \times 10^{-7}$ mg/kg	$4.1 \times 10^{-7}$ mg/l
Total Steady State Accumulation	$1.3 \times 10^{-5}$ kg	$3.3 \times 10^{-5}$ kg	$4.0 \times 10^{-6}$ kg	$1.0 \times 10^{-5}$ kg
Recovery (75% removed)	12 hours	12 hours	12 hours	12 hours
Selfpurifica- tion	64 hours	64 hours	64 hours	64 hours

TABLE 3

Exposure Analysis Modeling System (EXAMS50) for fenamiphos  
(Nemacur) in the Lotic (River) Environment

EXAMS 50 Parameters	Application Rates			
	20 lb a.i./A		6 lb a.i./A	
	Drift Load (DRFLF)		Drift Load (DRFLD)	
	low runoff	high runoff	low runoff	high runoff
	$1.5 \times 10^{-3}$ kg/hr	$3.76 \times 10^{-3}$ kg/hr	$0.45 \times 10^{-3}$ kg/hr	$1.3 \times 10^{-3}$ kg/hr
Maximum conc. in water	$8.6 \times 10^{-9}$ mg/l	$2.1 \times 10^{-8}$ mg/l	$2.6 \times 10^{-9}$ mg/l	$6.5 \times 10^{-9}$ mg/l
Maximum conc. in sediment deposit (dry wt)	$2.5 \times 10^{-10}$ mg/kg	$6.2 \times 10^{-10}$ mg/kg	$7.4 \times 10^{-11}$ mg/kg	$1.9 \times 10^{-10}$ mg/kg
Total Steady State Accumulation	$2.6 \times 10^{-6}$ kg	$6.5 \times 10^{-6}$ kg	$7.8 \times 10^{-7}$ kg	$2.0 \times 10^{-6}$ kg
Recovery (75% removal)	12 hours	12 hours	12 hours	12 hours
Selfpurifica- tion	2 hours	2 hours	2 hours	2 hours

