

US EPA ARCHIVE DOCUMENT

Chemical Trade Nemacur

Common

Chemical Ethyl 3-methyl-4-(methylthio)phenyl
(1-methylethyl)phosphoramidate

Company Chemagro

Submission TEMP PERMIT 3125-EXP PETITION REGISTRATION

Date submitted 1/9/74 Date received 3/13/74

Type of chemical Nematicide

Use Non-bearing deciduous fruit trees.

2 applications
1) 15G 3,740 lbs
2) EC (35%) 187 gallons

Data submitted for review

Environmental safety:

Mammal LD₅₀

Mammal chronic

Fish No new data

Bird

Shrimp, crab, oyster

Other

Environmental chemistry (70-15)

Fish residue No new data

Other

Chemical Nemacur.Conclusions

1. This is an extremely toxic pesticide to both birds and mammals.
2. We have objected to uses on several crops (3125-E1L, E1G, E2A) because of need for field monitoring studies.
3. The proposed use under this permit is non-bearing deciduous fruit trees at up to 20 lb/A a.i. w/ thorough soil incorporation.
4. No data are available to support the safety to birds and other wildlife, esp. at high rates. Simulated field tests with birds — bird mortality.
5. Field monitoring during permit is needed. Plan should be submit for review.
6. See attached scratch sheets. These sheets illustrate part of our concerns.

Recommendations

1. Field monitoring data are needed to determine possible environmental hazards of Nemacur to birds and other wildlife (See our comments on 3125-E1L, E1G, E2A). It will not be necessary to monitor ~~all proposed uses or~~ all sites, but sites that are utilized by wildlife and receive high rates of the chemical should be considered. A plan for gathering such data must be submitted ^{for} the ^{permit for the} proposed uses on non-bearing deciduous fruit trees is acceptable.

J. 3/13/74

NEMACUR

EHP PERMITS

3,740 lbs Nematicur 15% Granular

187 gallons EC (35% a.i.)

315 ai/gallon

15% Granular Label

For control of nematodes in non-bearing deciduous fruit trees.

1) 66.7 - 133.3 lbs (15G) / A

$$\begin{array}{r} 133.3 \\ + 1.5 \\ \hline 66.65 \\ + 133.3 \\ \hline 199.95 \end{array} \approx 20^* / A \quad 112$$

broadcast application
thoroughly incorporate
into soil by cross-disking.

2) Single tree application

$\frac{1}{2}$ - 4 oz (15G) per
tree in band $2\frac{1}{2}$ - 5 ft
thoroughly incorporate
granules into the soil.

Nematicur 3 (35% E.C.) 316 ai/gallon

For control of nematodes in non-bearing deciduous fruit trees.

1) $3\frac{1}{2}$ - $6\frac{1}{2}$ lbs / A

broadcast, soil surface
thoroughly incorporate into
soil by cross-disking.

2) Single tree application

2 - 1.6 fl oz per tree, in
thoroughly

Theoretical acute effects

Single tree application (maximum application)

$$.60 \text{ g a.i./tree} = 17 \text{ g/tree} = 17,000 \text{ mg/tree}$$

Toxicity	LD ₅₀	est. body weight	toxicant bird
quail	0.8 mg/kg	.25 kg	.2 mg
mallard	1 mg/kg	1.0 kg	1.0 mg

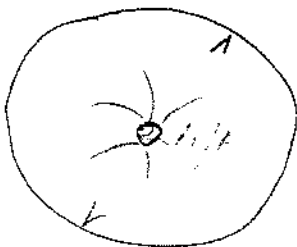
17,000 mg toxicant is sufficient to kill 50% of a

a) quail population of:

$$\frac{17,000 \text{ mg toxicant}}{.2 \text{ mg/quail}} = 85,000$$

b) duck population of:

$$\frac{17,000 \text{ mg toxicant}}{1 \text{ mg/duck}} = 17,000$$



$$A = \pi r^2 = \frac{22 \times 52}{7} = \frac{550}{7} \approx 80 \text{ ft}^2$$

$$\therefore 17,000 \text{ mg} / 80 \text{ ft}^2 = 212.5 \text{ mg/ft}^2$$

$$\begin{array}{r} 22 \\ \times 25 \\ \hline 110 \\ \times 4 \\ \hline 550 \end{array}$$

$$\begin{array}{r} 71 \\ 7150 \\ \times 49 \\ \hline 30000 \end{array}$$

$$\frac{80}{4.35 \times 10^4} = \frac{.603}{4}$$

$$804 = 4.35 \times 10^4 \times .603$$

$$4 = \frac{4.35 \times 10^4 \times .603}{80}$$

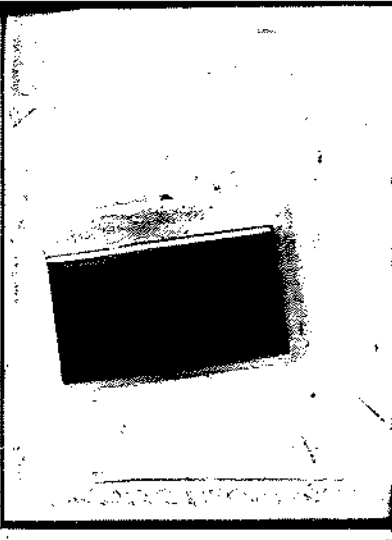
$$\frac{80 \text{ ft}^2}{4.35 \times 10^4} = \frac{.603}{x}$$

$$x = \frac{.6 (4.35 \times 10^4)}{80} = 3262.5 \text{ g} \approx 300 \text{ lb/A a.i.} \approx 208 \text{ mg/ft}^2$$

$$x = \dots$$

100601-

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



67,000 mg / 48 ft²

1396

$$\begin{array}{r}
 1396 \\
 48 \overline{) 75500} \\
 \underline{48} \\
 190 \\
 \underline{144} \\
 460 \\
 \underline{432} \\
 280 \\
 \underline{240} \\
 400
 \end{array}$$

1396 mg / ft²

1396 mg / ft²
.2 mg / bird

.8 mg / kg
x .25 kg / bird

$$\begin{array}{r}
 6720 \text{ birds / ft}^2 \\
 2 \overline{) 1.3960} \\
 \underline{12} \\
 17 \\
 \underline{16} \\
 10
 \end{array}$$

2 mg / bird
Total = 1.6980 mg / ft²

1.6980 mg / ft²

(rate of application)

1.6980 mg / ft² x 1000 ft² / acre = 1698 mg / acre

1698 mg / acre

Nemacur 3E + 15G (Bay 68133)

1. 3125-EXP-124G and 125G - Ch. magro
2. septemic nematocide
3. label "Toxic fish, birds & other wildlife ... Keep out of ...
birds may be killed ... do not contaminate H₂O ..."

4. mortality

species	irrigated	nonirrigated	rate spec.	irrig.
15G sparrows	✓ (50%)	— (69%)		
15G bobwhite	—	2/12		
15G rabbits	0	0		
3E pheasant			0 @ 5 lbs/A	
15G pheasant				40 lbs/A 20%
15G rice bird				10%
3E " "				25%

* 5. see letter dated 4/24/74

Total birds

Before

After

Bluejay 1 ~~##~~

~~##~~ Bluejay 6

Crow 5

~~##~~

Dove 3

Dove 10

Grackle 32

Downy Woodpecker 2

Grackle 49

Great Blue heron 1

Meadowlark 3

Meadowlark 24

Mockingbird 2

Mockingbird 2

Nighthawk 2

Nighthawk 4

quail 1

red belly woodpecker 4

red head woodpecker 5

red wing 8

robin 7

sparrow 10

total 37

unknown 15

red head woodpecker 10

red wing 21

robin 5

shrike 1

sparrow 17

starling 4

swallow 10

thrush 1

unknown 6

$$\chi^2 = 665.886$$

16 species

15 species

6 rank

$$\text{sig} = \frac{30.14}{19.05}$$



Total

$$\begin{aligned} \chi^2 &= \sum \left(\frac{(O-E)^2}{E} \right) = \frac{(6-1)^2}{1} + \frac{(0-5)^2}{5} + \frac{(10-3)^2}{3} + \frac{(2-0)^2}{0} + \frac{(49-32)^2}{32} + \frac{(1-0)^2}{0} + \frac{(24-3)^2}{3} + \\ &\quad \frac{(2-2)^2}{2} + \frac{(4-2)^2}{2} + \frac{(0-1)^2}{1} + \frac{(4-0)^2}{0} + \frac{(51-10)^2}{10} + \frac{(8-1)^2}{21} + \frac{(7-5)^2}{5} + \\ &\quad \frac{(0-1)^2}{1} + \frac{(10-17)^2}{17} + \frac{(37-4)^2}{4} + \frac{(15-10)^2}{10} + \frac{(0-1)^2}{1} + \frac{(0-6)^2}{6} \\ &= 25 + 5 + \frac{49}{3} + \frac{17^2}{32} + \frac{21^2}{3} + 2 + 1 + \frac{41^2}{10} + \frac{13^2}{21} + \frac{4}{5} + 1 + \\ &\quad \frac{49}{17} + \frac{33^2}{4} + \frac{25}{10} + 1 + 6 \\ &= 41 + \frac{49}{3} + 9 + \frac{1}{32} + 147 + 168 + \frac{1}{10} + 8 + \frac{1}{21} + \frac{4}{5} + 28 + \frac{14}{17} + \\ &\quad 272 + \frac{1}{4} + 2 + \frac{1}{2} \\ &= 647 + 16 + \frac{1}{3} + \frac{1}{32} + \frac{1}{10} + \frac{1}{21} + \frac{4}{5} + \frac{14}{17} + \frac{1}{4} + \frac{1}{2} \\ &= 663 + 2.886 \\ &= 665.886 \end{aligned}$$

$$\chi^2_{19, 0.5} = 30.14$$

Not significant

in plot or heard

Before	after
Jay 1	6
Crow 4	0
love 3	3
downy 0	2
grouse 13	33
meadow 3	11
mock 1	1
hawk 2	0
quail 1	0
red bellied 0	1
redhead 8	22
redwing 19	6
robin 3	2
shrike 1	0
sparrow 3	2
starling 0	7
wren 1	2
thrush 1	0
UNK 6	0

in plot or head

$$\begin{aligned} \chi^2 \left(\frac{\sum (O-E)^2}{E} \right) &= \frac{(6-1)^2}{1} + \frac{(0-4)^2}{4} + 0 + 0 + \frac{(33-13)^2}{13} + \frac{(1-3)^2}{1} + 0 + \\ &\quad \frac{(0-2)^2}{2} + 1 + 1 + \frac{(22-8)^2}{8} + \frac{(5-1)^2}{19} + 1 + 1 + 1 + 0 + 1 + 1 + \frac{(0-6)^2}{6} \\ &= 25 + 4 + 0 + 0 + 30\frac{10}{13} + 21\frac{1}{3} + 0 + 2 + 1 + 1 + 24\frac{1}{2} + 8\frac{1}{2} + \\ &\quad 1 + 1 + 1 + 0 + 1 + 1 + 6 \\ &= 127 + \frac{10}{13} + \frac{1}{3} + \frac{1}{2} + \frac{1}{21} \\ &= 128.65 \end{aligned}$$

$$\text{signif } 18,05 = 28,87$$

11N Plot

before	after
jay 1	0
crow 1	0
dove 2	1
downy 0	2
<u>grackle</u> 7	31
<u>meadow</u> 1	9
mock 0	1
hawk 2	0
red-billed 0	1
<u>red head</u> 6	20
red wing 14	3
robin 3	2
shrike 1	0
sparrow 3	2
starling 0	7
swallow 1	2
thrush 1	0
UNK 6	0

1N Plot

before	after
jay 1	0
crow 1	0
dove 2	1
downy 0	2
<u>grackle</u> 7	31
<u>meadow</u> 1	9
mock 0	1
hawk 2	0
red-billed 0	1
<u>red-head</u> 6	20
red-wing 14	3
robin 3	2
shrike 1	0
sparrow 3	2
starling 0	7
swallow 1	2
thrush 1	0
UNK 6	0

$$\begin{aligned}
 \chi^2 &= \sum \left(\frac{(O-E)^2}{E} \right) = 1+1+1+0 + \frac{(31-7)^2}{7} + \frac{(9-1)^2}{1} + 0 + 2+0 + \frac{(20-6)^2}{6} + \\
 &\quad \frac{(3-1)^2}{1} + 1+1+1+0 + 1+1+6 \\
 &= 1+1+1+0 + 82\frac{2}{7} + 64 + 0 + 2+0 + 32\frac{2}{3} + 8\frac{9}{14} + 1+1+1+0+1+1+6 \\
 &= 202 + \frac{2}{7} + \frac{2}{3} + \frac{9}{14} \\
 &= 202 + 1.596 \\
 &= 203.596
 \end{aligned}$$

$$\text{signif } 17,05 = 27.59$$

air-insects

swallows

night hawk

insects-foliage

(robin)

mockingbird

thrush

insects-lark

downy woodpecker

redbellied "

redhead "

insects-ground

(meadowlark) (quail)

crow

(sparrow)

(sparrow)

(bl. bird)

weed

(sparrow)

(meadowlark)

(bl. bird)

quail

quail

dove

jay

~~crow~~

dove

~~crow~~

quail

heron

~~crow~~

crow

hawk

quail

~~redbelly~~

redhead

~~crow~~

~~crow~~

shrike

~~crow~~

starling

~~crow~~

~~crow~~

USK

jay

~~crow~~

~~crow~~

~~crow~~

shrike

S. C. The

heron

	total		in field		in plot	
	before	after	before	after	before	after
meadowlark	3	24	3	11	1	9
crow	5	0	4	0	1	0
quail	1	0	1	0		
robin	5	7	3	2	3	2
sparrow	17	10	3	2	3	2
redwing	21	8	19	6	14	3
grackle	32	49	13	33	7	31
dove	3	10	3	3	2	1
starling	4	37	0	7	0	7

$$\chi^2 = \sum \left(\frac{(O-E)^2}{E} \right) = \frac{(24-3)^2}{3} + 5 + 1 + \frac{4}{5} + \frac{49}{17} + \frac{(8-10)^2}{10} + \frac{12^2}{32} + \frac{49}{3} + \frac{33^2}{4}$$

$$= 147 + 5 + 1 + \frac{4}{5} + 2\frac{15}{17} + 8\frac{1}{21} + 9\frac{1}{32} + 16\frac{1}{3} + 70\frac{3}{4} = 278 + \frac{4}{5} + \frac{15}{17} + \frac{1}{21} + \frac{3}{32}$$

$$= 280.844$$

total sign $7, 05 = 15.51$

in plot + field

$$= \frac{3^2}{3} + 4 + 1 + 1 + 1 + \frac{13^2}{17} + \frac{40^2}{13} + 0 + 0$$

$$= 21\frac{1}{3} + 4 + 1 + 1 + 1 + 8\frac{17}{17} + 30\frac{12}{13} + 0 + 0 = 66 + \frac{1}{3} + \frac{17}{17} + \frac{10}{13} = 67.77$$

sign $7, 05 = 15.51$

in plot

$$= 64 + 1 + 1 + 1 + \frac{12^2}{17} + \frac{(24)^2}{7} + 1 + 0$$

$$= 64 + 1 + 1 + 1 + 8\frac{12}{17} + 82\frac{2}{7} + 1 + 0 = 158 + \frac{12}{17} + \frac{2}{7} = 158.929$$

sign $7, 05 = 14.07$

1	3	2	1 3
Tot.	1, 1		T 4
bluejay	jay		1
redhead	redhead	redhead	1
grackle	grackle	grackle	G C G
redhead	redhead	redhead	
redwing			RW RW R1
starling			starling
			dove

jay	4	✓
lark	12	✓
grack	11½	✓
redhead	6	✓
redwing	4	
star	2	
dove	1	

meadowlark
 grackle
 redhead woodpecker

1
Tat.
~~jay~~
~~redhead~~
grackle
redhead
redwing
star

3
~~jay~~
~~redhead~~
grackle
redhead

2
~~jay~~
~~redhead~~
grackle
redhead

~~3~~, 3
T
~~grackle~~
G C G
RW RW R
starling
dove

~~jay 4~~
hawk 12 ✓
grack 11½ ✓
redhead 6 ✓
redwing 4
star 2
dove 1

Meadowlark
grackle
redhead woodpecker