FILE COPY

Date Out EFB: DEC 31 1981

To: Jay Ellenberger
Product Manager 12
Registration Division (TS-767)

From: Dr. Willa Garner, Chief
Review Section No. 1
Environmental Fate Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 3125-GNA & 3125-146

Chemical: Baygon (O-Isopropoxyphenyl)-N-(methylcarbamate)

Type Product: Insecticide

Product Name: Baygon

Company Name: Mobay Chemical Corporation, Agrichemicals Division

Submission Purpose: Adding Alfalfa and Pasture Grass

ZBB Code: 3(c)(7)

ACTION CODE: 181,336

Date In: 10/28/81

EFB # 28,29

Date Completed: 12/31/81

TAIS (level II)	Days
60	4

Deferrals To:

X Ecological Effects Branch

X Residue Chemistry Branch

X Toxicology Branch

Date Out EFB: DEC 31 1981

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Reg./File No.: 3125-GNA

Chemical: Baygon (O-Isopropoxyphenyl)-N-(methylcarbamate)

Type Product: Insecticide

Product Name: Baygon MOS

Company Name: Mobay Chemical Corporation, Agrichemicals Division

Submission Purpose: Use on Mosquitoes

ZBB Code: 3(c)(7)

ACTION CODE: 181

Date In: 10/29/81

EFB # 38

Date Completed: 12/31/81

TAIS (level II)	Days
60	4

Deferrals To:

__X__ Ecological Effects Branch

_____ Residue Chemistry Branch

__X__ Toxicology Branch

Date Out EFB: DEC 31

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Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 3125-121, -122 & -214

Chemical: Baygon (O-Isopropoxyphenyl)-N-(methylcarbamate)

Type Product: Insecticide

Product Name: Baygon

Company Name: Mobay Chemical Corporation, Agrichemicals Division

Submission Purpose: Fly Control in Livestock and Animal Barns

ZBB Code: 3(c)(7)

ACTION CODE: 336

Date In: 10/28/81

EFB # 30,31,32

Date Completed: 12/31/81

TAIS (level II)	Days
60	4

Deferrals To:

__X__ Ecological Effects Branch

_____ Residue Chemistry Branch

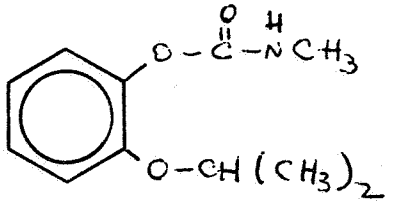
__X__ Toxicology Branch

1.0 INTRODUCTION

Pursuant to letters from RD on September 3, 1975 and again on November 7, 1977, the registrant submitted supportive EC data on October 6, 1981 for EFB review. Three separate RD actions were grouped by this reviewer, since they all depend upon this one data package (Accession number 246088, 10/21/81, for 3125-306)

2.0 STRUCTURE

Baygon: (O-Isopropoxyphenyl-N-methylcarbamate)



3.0 DIRECTIONS FOR USE

Labels for each product are appended to this review.

4.0 REVIEW of Accession Number 246088

4.1 Lounsbery, J.L. ®Baygon Water Solubility and Octanol/Water Partition Coefficient. Notebook Reference 80-R-65, pp 42-49, 55-66. Agricultural Chemicals Division, Mobay Chemical Corp. 9/3/80.[Report #69017]

Experimental

Suitable quantities of 99.8% Baygon were added to screwtop silanized culture tubes, shaken under standard conditions and analyzed for a.i. by HPLC. In a second experiment, Baygon was sonicated with H_2O/octanol in triplicate. Baygon in octanol was quantified by GLC, and in water by HPLC.

Conclusions

The aqueous solubility of Baygon at 20°C and pH 5.6 was found to be approximately 1750 ppm. The solubility of Baygon in octanol was observed to be greater than 9700 ppm. The average Octanol/Water partition coefficient (K_{OW}) was found to be about 36.

These studies are satisfactory, and further enhance our understanding of the physical properties of the active ingredient.

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4.2 Aly, Osman M. and M.A. El-Dib. Studies on the Persistence of Some Carbamate Insecticides in the Aquatic Environment-I...Hydrolysis of Sevin, Baygon, Pyrolan and Dimetilan in Waters. (publication unknown). April 11, 1971. pp 1191-1205. [Report # 34648]

This study was supe icially reviewed on 9/21/77. The only conclusion at that time was that the study in buffered NaOH was ancillary.

Experimental

The rate of hydrolysis of several carbamate insecticides was evaluated. For the purposes of this review, only the portions of this study pertaining to Baygon will be evaluated.

The analytical method used was as follows: Baygon was hydrolyzed in alkaline medium to its corresponding o-isopropoxyphenol and 1-naphthol, which were then reacted with 4-aminoantipyrine in the presence of an alkaline oxidizing agent to form a characteristic red-colored complex, which could be quantified by UV spectrophotometry. The limit of detection of this method was 3 ug/ml (3ppm) and was found to follow Beer's law over the range of concentrations tested.

Initially, 5 to 200 ug quantities of Baygon were allowed to stand for 5 minutes at 25 +/- 2°C in 5 ml of 0.5N NaOH, buffered to pH 8.0 +/- 0.2 by the addition of 5 ml of a phosphate buffer, then analyzed as above.

In a second experiment, the kinetics of hydrolysis were studied as follows: Buffer solutions (0.1M phosphate) were prepared, and adjusted to pH 4.0-10.0, to obtain working buffers of 0.01M strength. Buffers were mixed with each insecticide directly in a UV cuvette to a final concentration of 0.12 mmoles/l. The a.i. was introduced in methanol (final concentration=2%). The release of 1-naphthol was followed at 320 nm, and that of isopropoxyphenol at 290 nm. Rate constants were computed from the UV data.

Estimated Hydrolytic Rate Constants at 20°C

Molarity of NaOH	K_1 (/min)	K_2 (l/mole/min
0.0025	0.080	32.2
0.0050	0.172	34.4
0.0100	0.304	30.4

Effect of pH on hydrolysis was evaluated. Baygon was found to be stable to hydrolysis over the pH range 3.0-7.0. At pH 8, the rate of hydrolysis was found to increase with increasing pH. Therefore, halflife and first-order rate constants were determined at pH 8, 9 and 10 at 20°C.

pH	$T_{1/2}$ (days)	$T_{0.99}$ (days)	K_1
8.0	16.	106.6	3. E-5
9.0	1.6	11.4	2.8E-4
10.0	0.17	1.18	2.7E-3

Temperature dependence was evaluated, and the rate of hydrolysis was found to increase by a factor of 2.0 to 2.9 for each rise of 10°C.

Temp (°C)	Molarity of NaOH	K_1 (/min)	K_2 (l/min/mole)
5	0.01	0.073	7.37
10	0.01	0.112	11.2
20	0.01	0.304	30.4
30	0.01	0.759	75.9
40	0.01	1.16	116.

Conclusions

In water at/below pH 7.0 Baygon is stable to hydrolysis. At pH 8.0, hydrolysis is virtually complete (99%) in 107 days. In a statement, the authors speculate that Baygon should be more stable in high-salt waters than in low-salt waters, due to hydroxide common-ion effects.

The data on hydrolysis in acidic media are not convincing. This portion of the study should be redone to determine the hydrolytic rate constants under low pH conditions.

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4.3 Gronberg, R.R. and K.M. Pither. Photodecomposition of ®BAYGON in Aqueous Medium. Agricultural Chemicals Division, Mobay Chemical Corporation. August 11, 1977. Revised June 22, 1981. [Report # 53613]

Experimental

Neutral, aqueous (distilled water) 5 ppm Baygon solutions with and without photosensitizer were irradiated with intense artificial light, and the rate constants for the consequent degradation estimated. The Baygon used was uniformly ring-^{14}C-labeled, and was found to be 97% radiochemically pure with a specific activity of 10.37 mCi/mmole.

The light source simulated sunlight in Kansas City, Mo. during the months of June/July, and was considered by the researchers to be typical of field photo-conditions. Suitable dark controls were used throughout the study.

Analysis of photoproducts was done as follows: Solutions were chromatographed by TLC on silica gel F_{254} precoated plates, using one of three development systems, then assayed for radioactivity by radiochromatogram scanner. Quantitation was achieved by scraping the detected spots and subjecting them to LSC radiometric analysis. Aqueous samples were subjected to Gel Permeation Chromatography, and quantified by radioassay. Volatiles were suitably trapped and quantified.

Conclusions

Baygon (unsensitized) was relatively refractory to photolysis. After 21 days, 24% of the radio-activity was parent Baygon. Half-life without sensitizer was estimated to be 9.8 days, as compared with 41 days in darkness. (Half-life in another study referred to by the authors was 30 days in darkness at pH 7 and 30°C). With acetone sensitizer, half-life was 0.7 days. Adjusting the half-life figures to compensate for hydrolysis effects, the projected photolytic (unsensitized halflife) would be about 13 days.

Sizeable amounts (>50%) of the radiocarbon activity was found in the volatilized products, which consisted of either isopropoxyphenol or $^{14}CO_2$.

Material Balance data are summarized below.

		% Distribution			
		Non-Sensitized (After 21 days)		Sensitized (after 7 days)	
Fraction	Identity/Character	Irrad.	Non-Irrad.	Irrad.	Non-Irrad.
Base Trapped	$^{14}CO_2$	30.9	0.1	53.1	trace
Water Soluble	Polar (Polymeric?)	20.4	0.5	22.9	0.4
Organosoluble	BAYGON	24.3	67.7	0.1	87.5
	Isopropoxyphenol	2.0	12.0	0.0	7.6
	Other (origin-bound)	2.3	0.0	8.0	0.0
Losses	BAYGON or Isopropoxyphenol	20.1	19.7	15.9	4.5
	TOTALS	100.0	100.0	100.0	100.0
Radioactivity Characterized/Identified		97.7	100.0	92.0	100.0

This study is acceptable, and satisfies the data requirement under § 163.161-2.

4.4 Wilmes, Rolf. Experiments on the Photolytic Degradation of Baygon. PF report #1294. Agricultural Chemicals Division, Mobay Chemical Corporation. November 17, 1978. [Report # 67965]

Experimental

This photolysis experiment is very similar to § 4.3. Quantification of unknowns was by TLC and MS (details not provided). The report does include a summary of photolysis studies done by others up to the date of their review (Fall, 1978). Essentially, the paper deals with a number of theoretical considerations, such as free radical mechanisms of photolysis. Very little new information was provided.

Conclusions

Baygon was very photostable when irradiated on silica gel plates. In aqueous medium, some photoproducts identified included 4- and 6-N-methyl-benzamido-2-isopropoxyphenol, and 1-N-methylcarbamido-2,2'-diisopropoxybiphenol. As in § 4.3, some polymeric material was found at the TLC origin.

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4.5 McNamara, F.T. and K.D. Moore. Photodecomposition of ®BAYGON on Soil. Research and Development Department. Agricultural Chemicals Division, Mobay Chemical Corporation. April 28, 1981. [Report # 69476]

Experimental

Fully ^{14}C-ring-labeled Baygon was prepared and found to be 97% radiochemically pure with a specific activity of 10.37 mCi/mmole. The soil used was a sandy loam with the following characteristics.

Sand...58%, Silt...32%, Clay...10%, O.M...2.8%*, pH-5.1**
C.E.C...15.3 meq/100g @ pH 8.2, Particle Density- 2.4 gm/cc

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* Total O.C. x 1.9
** pH in 0.01M $CaCl_2$

Sunlamps were identical to those used in § 4.3. Four-gram aliquots of dry, sieved soil were treated with Baygon in methanol in a petri dish, so that final concentrations were 5 ppm with respect to Baygon. A total of 42 such dishes were prepared, with 6 taken initially as controls. Each remaining dish was attached to a gas-collection apparatus to trap volatiles and was exposed to sunlight as in § 4.3. Samples were taken for analysis on days 2, 5, 7, 14, 21 and 28. Quantification of degradates was achieved by methanol extraction, TLC and LSC. Overall losses for irradiated samples were about 10% (3% for controls) after 28 days.

Conclusions

After 28 days, the major component (75%) was Baygon, 12% was unextractable and 10% was volatilized. The calculated half-life was 77 days.

This study is acceptable, and satisfies the data requirements under § 163.161-3

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4.6 Church, D.D. and D.R. Flint. The Fate of ®Baygon (o-Isopropoxyphenyl-N-methylcarbamate) in Soil. Research and Development Department. Agricultural Chemicals Division, Mobay Chemical Corporation. August 1, 1971. [Report # 30590]

This study has previously been reviewed on 8/13/75 and on 9/21/77 (supplement #1, dated 1/16/75).

Experimental

This study was designed to evaluate the potential for Baygon to degrade in several soil types, under conditions which favor microbial activity. Soil types used included a sandy loam, a silt loam and a high organic silt loam. The study proposed that the overall metabolic degradative pathway involves decarbamylation to isopropoxyl phenbol, which subsequently releases an acetone moiety leaving a catechol structure. This can be further degraded in the soil. Remaining unidentified fragments did not behave as carbamates.

Conclusions [from 8/13/75 review]

Soil microorganisms appear to participate in the breakdown of Baygon. However, the stability to metabolism shown in the first series of tests indicates that concentration or other factors may influence microbial breakdown.

Conclusions [from 9/21/77 review]

This is essentially a study on the effects of soil microorganisms on Baygon. It was accepted on 8/13/75. Even though previously accepted, the following deficiencies based on current operating procedures are noted:

(a) Formulated product and not active ingredient alone was used in most of the study. Active ingredient alone should be used since formulations may affect results.

(b) Soil suspensions in water rather that bulk soils were used in two of the three studies. Bulk soils should be used to compare metabolic processes under sterile and nonsterile conditions. The soil should not be previously fortified with nonradiolabeled Baygon. The amount added should correspond to that added under actual use conditons. Pref' red sampling intervals are 1, 3, 7, 14, 20 and 30 days.

(c) [comments not related to current guidelines]

(d) Cation exchange capacity of the soil should be reported. Metabolism may vary in different soils, so soil characteristics are needed to define results

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4.7 Moore, Charles Albert. The Degradation of Two Insecticides by Soil Microorganisms. Masters Thesis. Mississippi State University, Department of Entomology, State College, Mississippi. August 1971. [Report # 33364]

This study was reviewed on 9/21/77 (supplement #1, dated 1/16/75).

Experimental

This study was designed to evaluate the residual toxicity of two insecticides (Bidrin and Baygon) after incubation with selected soil microorganisms. In addition, an evaluation of the in vitro cholinesterase inhibition by these two chemicals was tested as a potential assay method for organoposphate and carbamate insecticides.

Conclusions [from 9/21/77 review]

This study was reviewed on 8/13/75, and found acceptable. It is essentialy a study of the effects of microbes on Baygon, and complements material in Report #30590. Even though previously accepted, the following deficiencies based on current operating procedures are noted:

(a) [comments do not relate to current guidelines.]

(b) A radioisotope method shoud be used to detect Baygon and degradates rather than the indirect method of measuring acetylcholinesterase inhibition. Baygon should be labeled with ^{14}C on the benzene ring.

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4.8 Wilson, C.M., F.T. McNamara and R.G. Minor. Microbial Degradation of ®Baygon. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 7, 1981. [Report # 69492]

Experimental

This study was initiated to determine whether common soil microorganisms (as pure cultures) could degrade Baygon. Fungi tested included Penicillium daleae, Aspergillis niger, Phycomyces nitens, trichoderma viride. Bacteria tested included Streptomyces scabies, Bacillus subtilis, Pseudomonas maltophilea and Cellulomonas flavigena.

Conclusions

When Baygon was incubated in buffered (pH 7) nutrient broth for 14 days, it dissipated with a half-life of 35 days, with the primary pathway being hydrolysis to isopropoxyphenol. None of the organisms tested displayed significant degradative activity when compared with sterile distilled water controls.

This study, while superficially interesting, does not relate to current registration guidelines, and does not appreciable increase our understanding of the environmental behavior of Baygon.

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4.9 Gronberg, R.R., G.R. Hanna and S.H. Atwell. The Metabolism of ®BAYGON in Sandy Loam and Silt Loam Soils. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. August 25, 1981. [Report # 69617]

Experimental

This study was initiated to provide supplemental data evaluating the metabolism of Baygon in soil under aerobic, anaerobic and sterile conditions. Baygon was used which had been radiolabeled at either the ring or carbonyl groups, and had specific activities of 10.37 and 17.98 mCi/mmole, respectively. Both standards were >98% radiopure by TLC. Soils used in this study are summarized below.

	Sand (%)	Silt (%)	Clay (%)	O.M.* (%)	pH	C.E.C. (meq/100g)	Density (g/cc)
Silt Loam	3	75	22	2.3	6.4	32	2.6
Sandy Loam	56	28	16	2.2	5.7	9.7	2.6

* Total O.C. x 1.9

The silt loam soil was sifted to pass a 2 mm screen, fortified with either the carbonyl-labeled or ring-labeled Baygon standard, tumbled mechanically to assure uniformity and adjusted to 27% moisture content. Aliquots were weighed into test chambers designed to maintain darkness and aerobicity throughout the experiment. Vapors were suitably trapped for subsequent analysis. Additional aliquots were flooded with distilled water to maintain anaerobicity, then purged with nitrogen and tightly sealed.

The sandy loam soil was treated as above, but at a somewhat lower concentration of Baygon. The initial aerobic experiment was interrupted at 30 days, and anaerobic conditions created, then the experiment continued.

In a third series of experiments, sandy loam soil was sterilized and then treated as above, to evaluate degradation under sterile conditions.

Aliquots of the silt loam soil were taken for analysis on days 0, 14, 28, 56, 112 224 and 336 (ring UL-labeled standard) and on days 0, 14, 28 and 56 (carbonyl-labeled standard), in the aerobic experiment.

Aliquots of the sandy loam soil were taken for analysis on days 0, 30, 65, 91, 120 and 181 (ring UL-labeled standard) and on days 0, 7, 14, 28 and 56 (carbonyl-labeled standard), in the aerobic experiment. Aliquots of the sandy loam soil were taken for analysis on days 0, 30, 65, 91 (ring UL-labeled standard) in the aerobic/anaerobic experiment.

Identification and quantification was achieved by TLC (either autoradiograph or radioscanner), followed by scraping and LSC counting.

Results

Aerobic Experiments:

In the silt loam soil under aerobic conditions, total ring-labeled radiocarbon decreased from 7.9 ppm (Baygon equivalent) to 5.1 ppm after 336 days, while total carbonyl-labeled radiocarbon decreased from 9.3 ppm to 7.1 ppm after 56 days.

Aside from the residues of parent Baygon, the base traps accounted for the major portion of the degradate (volatilized, and assumed to be $^{14}CO_2$)

In the sandy loam soil under aerobic conditions, total ring-labeled radiocarbon decreased from 0.43 ppm (Baygon equivalent) to 0.35 ppm after 181 days. Although no trapping of vapors was performed with this soil, the 17% loss of radiocarbon was attributed to the same mechanism as with the silt loam (i.e. $^{14}CO_2$)

Anaerobic Experiments:

In the silt loam soil, both radiolabels were followed for 56 days during which time leaching into the flood water was found to have occurred, representing 24-37% (ring-^{14}C) and 21-33%(carbonyl-^{14}C) of the applied, respectively. In all cases the primary residue found was unchanged Baygon.

In the sandy loam soil, under aerobic (30 days)/anaerobic (61 days) conditions, distribution of radiolabels was very close to that observed in the silt anaerobic silt loam experiment.

Sterile Experiment:

No significant differences were observed between the sterile vs. unsterile experiments.

Conclusions

In aerobic silt loam and sandy loam soils, the degradation of Baygon followed 1st-order kinetics, with apparent half-lives of 112 and 180 days, respectively. Between 112 days and 1 year, the rate of degradation deviated from 1st order kinetics. Half-life in anaerobic silt loam soil was approximately 80 days. When sandy loam soil was flooded with water, the half-life for the next 61 days decreased to 108 days. Half-life in sterile soil was about the same as in non-sterile soil.

Aside from the parent Baygon and radio-$^{14}CO_2$, the only other major metabolite detected was isopropoxyphenol, which was found to be practically impossible to extract from the soil matrix.

It was concluded that the primary mechanism of degradation in all of these experiments was hydrolysis of the carbamate linkage followed by incorporation/volatilization of the hydrolytic products.

This study is deficient in several ways. The study was not conducted for a sufficiently long period for the establishment of the pattern of formation and decline of soil residues. Also, the identification of radioproducts was equivocal, since all gaseous material was assumed to be $^{14}CO_2$, but may well have included significant amounts of O-isopropoxyphenol. Finally, the studies should be conducted for a period of at least two half-lives, or 6 months, whichever comes first.

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4.10 Flint, D.R. and H.R. Shaw II. The Mobility and Persistence of ®BAYGON in Soil and Water. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. August 9, 1971. Revised to add data on 9/29/75. [Report # 30589]

This study was revised on 8/13/75 and on 9/21/77.

Experimental

In all studies except the batch equilibrium where technical grade Baygon was used, Baygon Spray Concentrate containing 1.5 lb a.i./ gallon was used. Were labeled Baygon was used, the radiolabel was affixed as either ^{14}C-carbonyl or 1,3-^{3}H-isopropyl. In these cases, the radio-Baygon was mixed with appropriate amounts of "Formulation Blank" to achieve the concentration of 1.5 lb a.i./ gallon.
Three "soil types" were used in this study, being "fabricated" by amending the local native soil with either peat or sand. Thus the native Silty Clay Loam was changed to either a Sandy Loam or a High-Organic Silty Clay Loam. The soil characteristics were as follows:

	Sand (%)	Silt (%)	Clay (%)	O.M. (%)	pH	Density (g/cc)	Total Porosity (%)
Sandy Loam	40	42	18	1.4	7.7	1.43	54
Silty Clay Loam	8	54	38	2.0	6.3	1.28	49
High Organic Silty Clay Loam	6	54	40	4.4	6.1	1.35	51

Soil plots were prepared in the spring of 1970 and the soil characteristics determined the following year (April, 1971). The plots were used during the summer of 1970 for apparently unrelated runoff studies, covered with black plastic over the winter, then rototilled preparatory to the current runoff experiments.

Adsorption Experiments

Aqueous solutions of ^{14}C-Baygon (.625-10 ppm) were shaken with 5 grams of each soil type for 20 hours (exact volume of solution used was not specified). After centrifugation, 5 ml of the supernatant was subjected to LSC quantification. The K_d was then interpolated from the data.

Runoff Experiments

Each plot consisted of three lanes which were adjacent to one another (separated by wooden dividers), 5' wide and either 15, 20 or 30' long. Three such plots were prepared (one for each soil type). Galvanized [illegible]ts at the foot of each plot were used to collect the runoff. Natural rainfall was excluded by covering the plots with black plastic during inclement weather.

The Baygon spray concentrate was applied by hand sprayer at a rate of 3.61 lb a.i./acre to the top 10 feet of each lane, the spray head being maintained about 12" above the ground surface.

Irrigation was by oscillating lawn sprayer, with the applied volume being estimated by "randomly" placed rain gauges. Runoff water was estimated for volume, subsampled, then kekpt frozen until analysis. The remainder was discarded.

Leaching Experiments

A 1.6 cm I.D. nylon tube was fitted with a stopcock to form a chromatographic column. Soil was added to the column, having first been amended (by 1/3) with Celite Filter-Aide to "permit a practical flow rate through the columns."

Baygon, radiolabeled at both ^{14}C and ^{3}H-positions was applied directly to the top of the column with a ul syringe, to give a final concentration of 10ppm relative to the soil(?). A single "void volume" of water was allowed to percolate through the column, and the eluate collected. Segments of column 1 cm long were subjected to LSC quantification.

A conversion of the data was made, to adjust the number of inches of rainfall which would be required to cause the Baygon to leach 12 inches through the column. The rationale for this conversion was not specified.

Water Stability Experiment

The three pseudo-hydrolysis experiments conducted in this portion of the overall study were conducted in a casual fashion, with technical details reported only superficially. This portion of the study bears no relationship to any applicable studies, and was not formally reviewed.

The GLC method utilized was not discussed in detail. The superficial review included in this study suggested that the procedure was outmoded and insensitive.

Results and Discussion

Adsorption Experiments

The estimated K_d's were 0.62, 0.49 and 1.12 for the Sandy Loam, Silty Clay Loam and ..gh Organic Clay Loam, respectively.

Runoff Experiment

This section states that the amount of irrigation applied was measured by the amount of runoff. This contradicts the earlier statement that rain gauges were used to estimate irrigation-fall. The results of this experiment were reported in a confused manner. For example, apparently all applied Baygon was recovered in the leachate, although residues were still measurable at significant levels in soil cores at the end of the experiment. No analyses were conducted to quantify metabolites.

Leaching Experiment

Baygon apparently moved swiftly through soil profiles, very close to the solvent (water) front.

Conclusion [this review]

Each part of this experiment suffers from numerous and serious deficiencies. The test procedures are questionable, including the soil types used, the amount of water applied, the amendment of soil with inert diluent in the leaching experiment, and the questionable and unsubstantiated analytical methodology. No material balance was provided for any portion of the study. Even the radiolabels may have been inappropriate, there being none on the phenol ring.

Conclusion [from review of 8/13/75]

More complete experimental data are needed, such as the amount of Baygon applied to the column, anount of water applied, activity found in effluent and column segments, etc. A leaching study on degradatin products will also be needed.

Statement on page 15 that 5 grams of soil were used per test does not appear to agree with statements on page 22, 23 and 24 that only one gram was used. This should be explained. (Note: This latter objection was based on apparent typographical errors, which were corrected in the copy currently reviewed.)

Conclusion [from review of 9/21/77]

(1) Baygon may be expected to move laterally in the environment through runoff.
(2) The runoff angle (<5°) is relatively small. Runoff rates given by the data should be condsidered as minimal indications of what might occur in terrain that is not flat. None of this study satisfies any of the EC data requirements.
(3) There were no analyses for degradation products or metabolites. These might be quite significant in runoff water as indicated by the low total recoveries reported (19-45%).

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4.11 Atwell, S.H. Leaching Characteristics of ®Baygon on Aged Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. November 10, 1976. [Report # 50718]

Experimental

Two radiolabeled Baygon standards were used in this study. One was ring-UL-^{14}C labeled, and the other Carbonyl-^{14}C labeled, having a specific activity of 10.37 and 17.98 mCi/mmole, respectively. Radiochemical purity was not specified.

The soil used was a silt loam having the following characteristics: 3% sand, 75% silt, 22% clay, 2.3% O.M. and pH 6.4. The chromatographic column used had an I.D. of 1.5cm and was 15" long.

Stock soil was prepared (1000 gms) to contain either ring-, or carbonyl-labeled Baygon, at a nominal concentration of 10 ppm. Aliquots were taken for analysis before the first run.

A 50 gram aliquot of treated soil was water saturated (method was not specified) and allowed to age "aerobically" for 28 days, after which time it was air dried. The chromatographic column was loaded with untreated soil (amount unspecified), then 5 grams of the dry, aged, radio-labeled soil added. Total soil column length was 12". Leaching was conducted over a period of 45 days, with no more than 1/2" of water added per day (total quantity added = 100 ml). [This figure is inconsistent with simple arithmetic, which would mandate 50 days (or more) to add a total of 100 ml at a rate of <=0.5 ml per day.]

Pretreatment control soil samples, core segments and eluate were analyzed for radio-residues by TLC and/or by LSC.

Results and Discussion

After aging, but before leaching, the distribution of compounds in the ring vs. carbonyl-labels was mostly parent Baygon (78 and

89%, respectively), with the remainder either Des-Methyl Baygon (2.9 and 4.0%, respectively) or "insolubles" (18.9 and 7.0%, respectively). After 45 days, 69.07 and 74.12%, respectively of the radiolabeled material was found in the leachate. Distribution of the radioactivity was as follows:

Soil Depth (inches)	% of Total Activity Found	
	Ring-^{14}C	Carbonyl-^{14}C
0 - 2	15.33	8.00
2 - 4	3.59	2.35
4 - 6	3.31	3.20
6 - 8	3.68	5.16
8 - 10	1.87	4.31
10 - 12	3.15	2.85
LEACHATE	69.07	74.13
	100.00	100.00

Thus, about 70% of the applied Baygon was found in the leachate.

Conclusions

Raw data are not reported, experimental conditions are vague (e.g. it is unclear from the writeup whether the column was allowed to go dry between daily solution additions. None of the runs were duplicated. Degradates were neither analyzed, nor quantified. This study is severely deficient.

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4.12 Thornton, J.S., J.B. Hurley and J.J. Obrist. Soil Thin-Layer Mobility of Twenty Four Pesticides Chemicals. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. December 15, 1976. [Report # 51016]

Experimental

Pesticide mobility in soil was evaluated using the method of Helling in which radiolabeled chemical is spotted on soil-TLC plates, which are then developed with distilled water and visualized by radioautography.

Six soils were used in this study. Textural characteristics were as follows:

Soil Type	Origin	% Sand	% Silt	% Clay	% O.M.	pH
Agricultural Sand	Vero Beach, FL	92	1	7	0.8	5.9
Sandy Loam	Merrill, OR	74	14	13	2.8	6.6
Sandy Clay Loam	Howe, IN	56	21	23	0.6	5.5
Silt Loam	Concord NB	18	57	25	5.1	7.9
Silty Clay	Hagerstown, MD	4	53	43	2.1	6.7
Silty Clay	Stanley, KS	0	41	59	0.5	6.0

The TLC plates were prepared by making a slurry with distilled water then applying the soil with a conventional spreader, to create a nominally 0.75 mm thick surface. In the case of the heavier soils, a slurry was made on the plate surface, then smoothed out with a calibrated glass rod, to create a more or less uniform thickness of 1.5 mm.

Pesticides tested in this study were as follows:

BAY MET 1486	CHE 8728	DYLOX	MORESTAN
BAY NTN 6867	CRONETON	GUTHION	NEMACUR
BAYGON	DASANIT	MATACIL	OFTANOL
BAYLETON	DDT	MESUROL	SENCOR
BAYTEX	DEXON	METASYSTOX-R	SRA 7660
BOLSTAR	DI-SYSTON	MONITOR	VOLATON

Sencor was used as an "internal" standard (due to its intermediate mobility characteristics) to adjust R_f values over the length of the study.

Results and Discussion

Table III of this study is appended to this review, and summarizes the mobility of the six different soil types. From the results of this study, Baygon would be classified as Class 4 (mobile), in the same group as Metasystox-R , Sencor and Croneton, with R_f values between 0.65 and 0.89.

Conclusions

No detail of the radiolabeling procedures was included in this study, and should be provided.

This study satisfies part of the leaching data requirements of §163.163-1.

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4.13 Lenz, M.F. and R.R. Gronberg. Soil Adsorption and Desorption of ®Baygon. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. August 28, 1980 [Report # 69016]

Experimental

Soil adsorption/desorption was evaluated for three soil types previously studied (see § 4.12, Sandy Loam - Merrill, OR, Silt Loam - Concord, NB, and Silty Clay - Stanley, KS)

Baygon was ring-UL-^{14}C labeled, and found to have a specific activity of 10.37 mCi/mmole, with >95% radiopurity. Solutions of Baygon at concentrations of 0.094, 1.74, 4.79 and 9.86 ppm were equilibrated with aliquots of each soil, and subjected to LCS quantification. Suitable controls were used throughout the study.

Results and Discussion

Freundlich adsorption constants were as follows: 0.05 for sandy loam; 0.30 for silt loam; and 0.27 for silt clay. This very low degree of adsorption is consistent with the soil TLC findings of § 4.12, confirming the high mobility of Baygon in virtually all soil types.

Conclusions

This study was very well done, and partially satisfies the leaching data requirements of §163.163-1.

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4.14 Stanley, C.W. A gas Chromatographic Method for the Determination of ®Baygon in Soils. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. July 8, 1971. [Report # 30447]

This method was reviewed on 8/13/75 and on 9/21/77.

Discussion [review of 9/21/77]

An analytical method for Baygon in clay or silt loam soil was developed. The method involves initial extraction with a chloroform-methanol-water mixture, a Florisil column chromatography cleanup step, derivitixation with trichloroacetyl chloride, and quantitation by gas chromatography using an electron capture gas detector. Confirmation was by injection onto a second column prepared with a different packing.

Typical recoveries are given as 104% for clay fortified at 0.05 ppm and 96% for silt loam fortified at 0.08 ppm.

Conclusion [this review]

The method is outmoded as a general analytical tool, and has been superceded by better techniques, such as HPLC.

Conclusion [review of 8/13/75]
Method does not determine degradation products.

Conclusion [review of 9/21/77]
Method does not determine degradation products.

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4.15 Morris, R.A. Determination of ®BAYGON, ®BAYTEX, BOLSTAR™, CRONETON™, ®DASANIT, ®DI-SYSTON, ®DYLOX, ®GUTHION, ®HINOSAN, ®MESUROL, ®META-SYSTOX-R, MONITOR®, ®MORESTAN, ®NEMACUR and ®SYSTOX Residues in Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. September 15, 1976.

Revised on 7/28/77 to include instrucitons for DASANIT and SYSTOX and to correct GUTHION instructions. [Report # 49675]

Discussion

This report summarizes modifications to previously developed analytical methodology for the determination of residues of a variety of pesticide products in soil.

Conclusion

The method cited by this author (Report # 30447) has already been found deficient. This report is also deficicent in that no data are given in support of the proposed modifications.

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4.16 Schiller, L.K. Recovery of ®BAYGON From Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 13, 1981. [Report # 69228]

Discussion

This report is a tabular summary of an experiment designed to evaluate the recovery efficiency of the analytical method reviewed in Report # 30447, as modified by Report # 49675. There is no discussion. Soils evaluated include a loam, a silt loam and a sandy loam. Representative chromatograms were appended.

Conclusions

Since virtually all experimental detail is lacking, and since no degradates were quantified, the report is irrelevant and does not support any EC data requirements.

4.17 Schiller, L.K. Recovery of ®BAYGON From Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 13, 1981. [Report # 69229]

Discussion

This report is a tabular summary of an experiment designed to evaluate the recovery efficiency of the analytical method reviewed in Report # 30447, as modified by Report # 49675. There is no discussion. Sand was the substrate used. Representative chromatograms were appended.

Conclusions

Since virtually all experimental detail is lacking, and since no degradates were quantified, the report is irrelevant and does not support any EC data requirements.

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4.18 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. January 21, 1981. [Report # 69240]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a sandy soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data, and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.19 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. January 21, 1981. [Report # 69241]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a sandy soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data, and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.20 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. January 21, 1981. [Report # 69242]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a silty clay loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.21 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. January 21, 1981. [Report # 69243]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a loamy sand soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.22 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. February 10, 1981. [Report # 69494]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.23 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. February 11, 1981. [Report # 69495]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a silt loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.24 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. February 11, 1981. [Report # 69496]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a sandy loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.25 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 15, 1981. [Report # 69497]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a loamy sand soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.26 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 15, 1981. [Report # 69499]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a sandy loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.27 Schiller, L.K.. ®BAYGON Soil Persistence Study. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. May 14, 1981. [Report # 69504]

Discussion

This report is a tabular summary of an experiment designed to evaluate the soil persistence of Baygon, applied to a loam soil as a 70 WP formulation. Details presented include application date, rate, sampling depth (12" max.), meteorological data and a summary of gross residues.

Conclusion

It is apparent from the "gross residue" data that applied Baygon quickly moved through the soil profiles, below the depth sampled. Additionally, since degradates were neither identified nor quantified, the report is irrelevant and does not support any EC data requirements.

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4.28 Lamb, D.W. and D.J. Roney. Accumulation and Persistence of Residues in Channel Catfish Exposed to ®Baygon-^{14}C. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. June 30, 1975 [Report # 44735]

This study was revie ›d on 1/15/76 and again on 9/21/77.

Discussion

See reviews of 1/15/76 and 9/21/77.

Conclusions [this review]

The catfish study is still unacceptable.

Conclusions [review of 1/15/76]

The data indicate that accumulation in catfish will not be significant.

Conclusions [review of 9/21/77]

Accumulation in whole fish was 1.2 times at 28 days. This study was reviewed on 1/15/76, and accepted. Even though previously accepted, the following deficiencies based on current operating procedures are noted:

(a) [comments not related to current guidelines]
(b) [comments not related to current guidelines]
(c) Study was not extended to 30 days or excposure and did not include a 14 day depuration period. Samples were not taken at all of the recommended intervals (specified in the review).
(d) In the submitted investigation, only water and whole body fish were sampled. Amount and identity of residue in water, whole body fish, edible tissue and viscera or carcass at each sample interval must be determined. Water should be sampled prior to fish exposure. [Then follow comments unrelated to current guidelines.] The amount of edible tissue will help define intake by humans.
(e) The combustion method should be used in preparing fish tissue samples for radioassay.
(f) Representative raw data (i.e. photographs or diagrams of TLC plates) and sample calculations have not been submitted.

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4.29 The Effect of Frozen Storage at 0 to -10°F on ®BAYGON Residues in Soil. Chemagro Chemical Division, Mobay Chemical Corporation. 11/23/76. [Report # 50725]

Discussion

This one page chart summarizes analysis of two soil samples (clay and silt loam) for "gross residues" after 361 days storage. Apparent initial Baygon concentrations of 1 ppm degraded by 11 and 8%, respectively, over this time period.

Conclusion

The analytical methodology utilized has already been extensively criticized as inadequate for detection of metabolites. Additionally, considerably more detail must be provided.

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4.30 Houseworth, L.D. and B.G. Tweedy. Effect of ®BAYGON on Microbial Populations. Department of Plant Pathology. University of Missouri, Columbia, Missouri. December 8, 1972. [Report # 35131]

This study was reviewed on 8/13/75 and again on 9/21/77.

Discussion

See reviews of 8/13/75 and 9/21/77.

Conclusion [review of 8/13/75]

Baygon has minimal effect on soil microorganisms under the conditions of the experiment.

Conclusion [review of 9/21/77]

Baygon has minimal effect on soil microorganisms under the conditions of the experiment. [additional comments unrelated to current guidelines.]

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4.31 Huhtanen, K., and G. Hanna . The Effect of ®BAYGON on Activated Sludge. Cannon Laboratories, Inc, Reading, PA. and Mobay Chemical Corporation, Kansas City, MO. May 12, 1978. [Report # 66066]

This study was reviewed on 9/1/78.

Discussion

See review of 9/1/78.

Conclusions [review of 9/1/78]

Based on the reported results of this study, Baygon and its degradates appear to have minimal or no effect on the activated sludge treatment process at pH range 6.5 - 7.0 and sludge temperature between 10° and 21°C. If it is ever discharged into municipal systems, Baygon for the most part will end up un-degraded into the aquatic environment. No inhibition of the treatment system will occur under the test conditions and up to 240 ppm of the chemical.

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4.32 Strankowski, K.J. and R.F. Kottman. Effects of ®BAYGON on Nitrification and Denitrification in Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. February 26, 1979 [Report # 67450]

Discussion

Sandy loam soil was supplemented and incubated with 0.5 ppm or 5 ppm BAYGON 1.5 LC. No effects on nitrification or denitrification were seen.

Conclusion

This study is no longer required.

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4.33 Strankowski, K.J. Effects of ®BAYGON on Isolated Soil Microorganisms. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. February 26, 1979. [Report # 67518]

Discussion

Selected bacteria (Bacillis subtilis, Cellulomonas flavigena, pseudomonas aeruginosa and Streptomyces scabies) and Fungi (Aspergillis niger, Pennicillium daleae, Trichoderma viride and Phycomyces nitens) were exposed to a range of concentrations of Baygon and the effects on growth evaluated.

Conclusions

No inhibition was detected in any of the bacteria or actinomycetes tested at Baygon concentrations from 2 to 1000 ppm. At 2 ppm no growth inhibition occurred in any fungal species except the Phycomyces, where only a [illegible] inhibition occurred.

This study is no longer required.

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4.34 Strankowski, K.J. and R.F. Kottman. Effects of ®BAYGON on Nitrogen Fixation. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. April 6, 1979. [Report # 67746]

Discussion

A sandy loam soil was amended with Baygon at 0.5 ppm. Soybeans grown in this soil, when compared to test controls, showed no significant in nodular nitrogen-fixing ability.

Conclusions

This study is no longer required.

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4.35 Minor, R.G. and G.D. Parker. Effect of ®BAYGON on Asymbiotic Nitrogen Fixation in Soil. Research and Development Department, Agricultural Chemicals Division, Mobay Chemical Corporation. November 20, 1980 [Report # 69281]

Discussion

Baygon, at 0.5 ppm, had no significant effect on the asymbiotic nitrogen-fixing ability of sandy loam after 3 days of incubation at 30°C.

Conclusions

This study is no longer required.

5.0 SUMMARY

5.1 The following studies were found acceptable: 4.1, 4.3, 4.4, 4.5, 4.12, 4.14, and 4.30 through 4.35.

5.2 The following studies were either incomplete or otherwise unacceptable: 4.2, 4.6 through 4.11, 4.14 through 4.16, 4.28 and 4.29. See specific review for objections and comments.

5.3 The following EC data requirements were satisfied by this submission:

§ 163.161-2 Photolysis in Water
§ 163.161-3 Photolysis in Soil
§ 163.163-1 Soil TLC
Solubi ty of Baygon in Water
Octanol/Water Partition Coefficient

6.0 CONCLUSIONS

6.1.1 Reg.File No. 3125-GNA, 3125-146
Purpose of Submission: to add Alfalfa and Pasture Grass

6.1.2 Due to the numerous deficiencies cited in this review (resulting in extensive data gaps) we cannot concur with the proposed label addition at this time.

Specifically, we are most troubled by the lack of identification of degradates/metabolites in numerous studies.

Also, since the interval between sampling and analysis in some of the studies has been up to two years (see review), the study on stability of Baygon under storage conditions is essential.

Finally, the apparent high mobility of Baygon in soils of all kinds demands the successful resolution of the deficiencies of the field dissipation prior to our concurrence with additional use of this chemical.

6.2.1 Reg.File No. 3125-121, 3125-122 and 3125-214
Purpose of Submission: to add Fly Control in Livestock and Animal Barns

6.2.2 We cannot concur with this proposed label addition at this time, for the reasons cited in 6.1.2.

6.3.1 Reg.File No. 3125-GNA
Purpose of Submission: Use on Mosquitoes

6.2.2 We cannot concur with this proposed label addition at this time, for the reasons cited in 6.1.2.

7.0 RECOMMENDATIONS

7.1 The registrant should be notified of the numerous testing deficiencies.

7.2 Due to the demonstrated high mobility of Baygon and possibly of its major metabolites/degradates (des-methyl Baygon and O-isopropoxy phenol), we defer to Ecological Effects Branch on the issue of possible impact on susceptible aquatic invertebrates which may result from the sudden occurrence of a severe rainfall event soon after application, from drift from aerial applications, or from movement of these compounds through soil profiles back into surface waters.

7.3 Due to the demonstrated high mobility of Baygon, we defer to Toxicology Branch on the issue of possible human exposure which may result from contamination of ground water or surface water drinking supplies by Baygon and its major metabolites (des-methyl Baygon and O-isopropoxy phenol) due to movement of these compounds through soil profiles.

7.4 Due to the apparent persistence of Baygon is soil, we defer to Residue Chemistry Branch on the issue of residues in alfalfa and pasture grass.

Emil Regelman
Chemist
EFB/HED

Propoxur environmental fate review

Page _____ is not included in this copy.

Pages 33 through 37 are not included in this copy.

The material not included contains the following type of information:

___ Identity of product inert ingredients

___ Identity of product impurities

___ Description of the product manufacturing process

___ Description of product quality control procedures

___ Identity of the source of product ingredients

___ Sales or other commercial/financial information

X A draft product label

___ The product confidential statement of formula

___ Information about a pending registration action

___ FIFRA registration data

___ The document is a duplicate of page(s) _____

___ The document is not responsive to the request

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

T-529
Ref. 3

[3125-122]

Base Reg. (975)

U.S. LABEL

Reason to Issue: To revise directions for use in meat and food processing plants in accordance with PR Notice 68-14 and USDA letter of 11/27/68.

Date of Draft: 2/18/69
Supersedes Draft Dated: 9/27/68

Product No. 111321 (6 x 1 gal/cs)

Reg. U.S. 6/5/67

ACCEPTED

APR 25 1969

UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR REGISTRATION FOR USE IN THE U.S. SUBJECT TO LABELING ACCEPTED.

(R)
BAYGON

SPRAY CONCENTRATE

INSECTICIDE

FOR USE BY QUALIFIED PEST CONTROL OPERATORS AND COMMERCIAL APPLICATORS

FOR EFFECTIVE CONTROL OF CRAWLING HOUSEHOLD INSECTS, FLIES, MOSQUITOES, AND LAWN CHINCH BUGS

GUARANTEE: Contains 1.5 lbs. o-Isopropoxyphenyl methylcarbamate per gallon.

NET CONTENTS GALLON(S)

ACTIVE INGREDIENT:	
o-Isopropoxyphenyl methylcarbamate ≠	17%
INERT INGREDIENTS:	83%
	100%

≠U.S. Patent No. 3,111,539
Canadian Patent No. 725,204

USDA Reg. No. 3125-122

WARNING

KEEP OUT OF REACH OF CHILDREN
(See rear panel for warning statements)

CAUTION: Do not store below 32° F. Keep away from direct sunlight, radiators, stoves, and other heat.

STOP - READ THE LABEL BEFORE USE

MANUFACTURED BY

CHEMAGRO CORPORATION

KANSAS CITY, MO.

NOTE: Underlined letter in the label is [illegible] when printed.

35

DIRECTIONS FOR USE

IMPORTANT: Read these entire Directions and Conditions of Sale, including the Warranty and Limitation of Damages provision, before using BAYGON Spray Concentrate Insecticide.

CONDITIONS OF SALE: These Directions for Use reflect the opinion of experts based on tests of effectiveness, of toxicity to laboratory animals under normal conditions of use. However, because of the wide range of conditions under which this product may be used, even though label directions are followed, it is impossible to eliminate all risks associated with its use because of abnormal conditions beyond the control of the seller. Chemagro Corporation and the Seller offer, and the Buyer uses, this product subject to the understanding that the Buyer assumes all such risks.

BAYGON Spray Concentrate gives excellent control of such insects as ants, cockroaches, clover mites, crickets, earwigs, fleas (outdoors), mosquitoes (outdoors), flies, hornets, millipedes, saw-toothed grain beetles (exposed stage), scorpions, silverfish, sowbugs, spiders, brown dog ticks, wasps, waterbugs, lawn chinch bugs, sod webworms (lawn moths), billbugs, punkies and sand flies. It provides good flushing action of cockroaches, rapid knockdown and long residual control of these and the other insects. BAYGON will also control strains of cockroaches and mosquitoes resistant to certain chlorinated hydrocarbon and organophosphate insecticides. BAYGON Spray Concentrate mixes readily with water and may be applied with most types of hand or power-operated sprayers. Agitate spray mixture frequently.

Caution: Do not use in fiberglass tanks. The spray mixture made from this formulation may loosen paint coatings in metal tanks if allowed to stand for more than a few hours. Clean tanks thoroughly before and after use.

Pest Control In and Around Homes, Apartment Buildings, Restaurants, Stores and Warehouses

Indoors: Mix 8 fluid ounces (1/2 pint) BAYGON Spray Concentrate in 1 gallon of water* (1.1% concentration) and apply as a residual spray to baseboards, window frames, the undersides of shelves and drawers, under sinks and stoves and to other places where insects may hide. Also spray cracks, crevices and surfaces where insects may crawl when they come out of hiding. For ants, spray trails and places where ants enter premises. Repeat as necessary. Do not spray foodstuffs or house plants. DO NOT USE AS A SPACE SPRAY. PROVIDE ADEQUATE VENTILATION OF AREA BEING TREATED. Do not allow children to contact treated surfaces until surfaces are completely dry.

Outdoors:

Residual Spray for Ants, Cockroaches, Earwigs, Flies, Hornets, Millipedes, Mosquitoes, Spiders, Crickets, Clover Mites, Fleas, Scorpions, Sowbugs, Brown Dog Ticks, Wasps, and Waterbugs. Mix 8 fluid ounces (1/2 pint) of BAYGON Spray Concentrate in 1 gallon of water* (1.1% concentration) and apply as a residual spray or with a paint brush to surfaces of buildings, porches, screens, window frames, patios, and garages where these insects congregate. For control of wasps and hornets, apply after dark when all of the insects have returned to the nest. Repeat as necessary. Do not treat plants (lawns, flowering plants, shrubs, trees, etc.) with this concentration.

To control sand flies or punkies (*Culicoides* spp.), mix 8 fluid ounces (1/2 pint) BAYGON Spray Concentrate in 1 quart of water* (4.5% concentration) and apply with a paint brush to outside surfaces of door and window screens and other screened areas where insects may enter buildings. Thorough coverage is necessary for maximum control.

DIRECTIONS FOR USE (Continued)

Mist Spray For Mosquitoes:

Apply 4 1/4 to 6 fluid ounces (0.05 to 0.07 lb. active) per acre. For mist-blower machines calibrated to deliver 100 gallons per hour traveling at a speed of 4 m.p.h. and covering a swath width of up to 350 feet, use 5 1/2 to 8 gallons of spray concentrate per 100 gallons of water* to treat 170 acres.

PRECAUTIONARY NOTE: Shrimp may be killed at application rates recommended by this label.

Pest Control in Meat Packing and Food Processing Plants:

Mix 8 fluid ounces (1/2 pint) of BAYGON Spray Concentrate in 1 gallon of water* (1.1% concentration) and apply as a residual spray to walls, ceilings, and other infested areas. Use only in the inedible products areas of meat packing and food processing plants, including plants that are federally inspected. When using the spray in the inedible products areas where no exposed food or processing equipment is present, take any needed precautions to avoid contamination of packaged or stored food commodities.

Spraying unloading docks and outside areas where insects congregate will aid in preventing re-infestations. Good sanitation and proper disposal of wastes is essential in any effective insect control program.

Pest Control in Animal Research Facilities:

The use of BAYGON in and around research animal quarters for pest control will not induce changes in liver microsomal enzyme activity in these animals.

Pest Control on Lawns and Turf:

Sod Webworms (lawn moths) - To control sod webworms on lawns and turf mix 11 fluid ounces (approximately 1 1/2 cups) of BAYGON Spray Concentrate in 10 to 15 gallons of water* and apply to 1000 square feet of area. For best results mow the lawn and rake dead grass from damaged spots. Water the lawn thoroughly and allow grass to dry before spraying with BAYGON. If possible do not water again for several days. Three applications at monthly intervals may be required for maximum control. In most areas the first application should be made in May or June. Consult your local State Agricultural Experiment Station or Extension Service for more specific information regarding timing of applications.

Chinch Bugs and Hunting Billbugs (Florida Only) - Apply 16 fluid ounces (1 pint) of BAYGON Spray Concentrate per 1,000 sq. ft. of lawn or turf area. Do not use less than 15 gallons of water* per 1,000 sq. ft. For best results, use 30 to 40 gallons of water per 1,000 sq. ft. Repeat as necessary. For effective control of chinch bugs, BAYGON Spray Concentrate should be applied during the spring and summer months or as recommended by your State Agricultural Experiment Station or Extension Service. For best results, lawns should be watered before applying BAYGON.

PRECAUTIONARY NOTE: Birds feeding on treated areas may be killed.

*The use of this material in water at 40° F. or below will result in crystallization in the spray tank. Do not use in oil. Do not allow spray mixture to stand overnight in the spray tank.

DIRECTIONS FOR USE
(Continued)

MIXING CHART:

Concentration of BAYGON Required	Fluid Ounces of BAYGON Spray Concentrate to Add To:		
	1 Gallon U.S.	3 Gallons U.S.	10 Gallons U.S.
1.1%	8 (1/2 pint)	24 (1 1/2 pints)	80 (5 pints)
4.5%	32 (2 pints)	96 (6 pints)	320 (20 pints)

RESTRICTIONS

Since this is a water suspension material, do not apply to rugs, carpets, draperies, wallpaper, or similar materials that may be stained or watermarked. The solvents of this formulation may stain certain plastic, rubber, and asphalt materials, such as tiles and floor coverings. Do not treat such materials without first testing a small inconspicuous area.

Do not use as a space spray. Provide adequate ventilation of area being treated.

Do not apply to animals or humans.

Do not use on plants other than those recommended.

Do not use in animal barns or poultry houses for fly control.

WARNING

May be fatal if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or on clothing. In case of prolonged exposure, wear natural rubber gloves, protective clothing, and goggles. In case of contact, wash immediately with soap and warm water. Do not store near feed or food products. Do not contaminate food. Wash hands, arms, and face thoroughly with soap and water before eating or smoking. Wash all contaminated clothing with soap and hot water before reuse.

Do not reuse empty container. Perforate container and bury or discard in a safe place.

If illness occurs, get prompt medical aid.
To Physician - Atropine sulfate is antidotal.

WARRANTY AND LIMITATION OF DAMAGES

Chemagro Corporation warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use and Conditions of Sale; subject to the risks referred to therein. Chemagro Corporation makes no other express or implied warranty, including any other express or implied warranty of FITNESS or of MERCHANTABILITY, and no agent of Chemagro Corporation is authorized to do so except in writing, with a specific reference to this warranty. Any damages arising from a breach of this warranty shall be limited to direct damages, and shall not include consequential commercial damages such as loss of profits or values, etc.

BAYGON is Reg. TM in U.S. Pat. Off. by Farbenfabriken Bayer A.G., Chemagro Corporation licensee.

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Page _____ is not included in this copy.

Pages 42 through 48 are not included in this copy.

The material not included contains the following type of information:

___ Identity of product inert ingredients

___ Identity of product impurities

___ Description of the product manufacturing process

___ Description of product quality control procedures

___ Identity of the source of product ingredients

___ Sales or other commercial/financial information

X A draft product label

___ The product confidential statement of formula

___ Information about a pending registration action

___ FIFRA registration data

___ The document is a duplicate of page(s) _____

___ The document is not responsive to the request

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Chemagro

BAYGON

70% WETTABLE POWDER

INSECTICIDE

ACC 1975

FOR EFFECTIVE CONTROL OF CERTAIN SPECIFIED CRAWLING HOUSEHOLD INSECTS AND FOUR GRINDER BUGS, AND FOR OUTDOOR CONTROL OF FLIES AND MOSQUITOES

FOR USE BY QUALIFIED PEST CONTROL OPERATORS AND COMMERCIAL APPLICATORS

NET WEIGHT 75 LBS.

WARNING

KEEP OUT OF REACH OF CHILDREN

(See side panel for warning statement)

ACTIVE INGREDIENT:	
2-(1-Methylethoxy)phenol methylcarbamate†	70%
INERT INGREDIENTS:	30%
	100%

†U.S. Patent No. 3,111,539
Canadian Patent No. 725,204

EPA Reg. No. 3125-146-AA

DIRECTIONS FOR USE (Continued)

Low Volume Spray for Control of Adult Mosquitoes:
Apply 1 to 4 ounces BAYGON 70% Wettable Powder (0.05 to 0.175 lb. active) per acre in ½ to 1 gallon total volume of water suspension by air.

Low Volume Oil Spray for Control of Adult Mosquitoes:
Apply 1 to 4 ounces BAYGON 70% Wettable Powder (0.05 to 0.175 lb. active) per acre in ½ to 1 gallon total volume by air. BAYGON 70% Wettable Powder and oil must be premixed before adding to the aircraft tank. The powder should be added slowly to the quantity of oil and mixed well during the addition. When the uniform mixture is obtained and the material is transferred, recirculation in the aircraft should be sufficient to maintain a homogeneous suspension. Precaution should be taken not to inhale dust particles during mixing.

Pest Control in Research Animal Facilities:
The use of BAYGON in and around research animal quarters for pest control will not induce changes in liver microsomal enzyme activity in these animals.

Pest Control on Lawns and Turf:
Sod Webworms (lawn moths) — To control sod webworms on lawns and turf mix 2¾ ounces (approximately 1 2/3 cups) of BAYGON 70% Wettable Powder in 10 to 15 gallons of water and apply to 1,000 square feet of area. For best results mow the lawn and rake dead grass from damaged spots. Water the lawn thoroughly and allow grass to dry before spraying with BAYGON. If possible do not water again for several days. Three applications at monthly intervals may be required for maximum control. In most areas the first application should be made in May or June. Consult your local State Agriculture Experiment Station or Extension Service for more specific information regarding timing of applications.

Bluegrass Billbug; Hunting Billbug (Southeastern U.S. Only) and Chinch Bugs (Florida Only) — Apply 4 ounces of BAYGON 70% Wettable Powder per 1,000 sq. ft. of lawn or turf area. Do not use less than 15 gallons of water per 1,000 sq. ft. For best results, use 30 to 40 gallons of water per 1,000 sq. ft. Repeat as necessary. For most effective control of chinch bugs, BAYGON 70% Wettable Powder should be applied during the spring and summer months or as recommended by your State Agricultural Experiment or Extension Service. For best results, lawns should be watered before applying BAYGON.

RESTRICTIONS

Since this is a water suspension material, do not apply to rugs, carpets, draperies, wallpaper, or similar materials that may be stained or watermarked.

Keep children and pets off treated areas until surfaces are dry.

Do not apply to animals or humans.

Do not use on plants other than those recommended.

Do not use in animal barns or poultry houses for fly control.

This product is toxic to wildlife. Birds feeding on treated areas may be killed.

Keep out of lakes, streams, or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

CONTAINER AND WASTE DISPOSAL

Rinse equipment and containers and dispose of waste by burying in non-crop land away from water supplies. Dispose of empty container with waste or by burning (Keep out of smoke).

WARNING

May be fatal if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or on clothing. In case of prolonged exposure, wear natural rubber gloves, protective clothing, and goggles. In case of contact, wash immediately with soap and warm water. Do not store near feed or food products. Do not contaminate food. Wash hands, arms, and face thoroughly with soap and water before eating or smoking. Wash all contaminated clothing with soap and hot water before reuse.

Should poisoning occur, obtain prompt medical aid.

To Physician — Atropine sulfate is antidotal.

BAYGON is a Reg. TM of the Parent Company of Farbenfabriken Bayer GmbH, Leverkusen. EPA Est. 3125-MO-1 909150 675230 Printed in U.S.A.

Chemagro
Agricultural Division
Mobay Chemical Corporation
Kansas City, Missouri 64120

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BAYGON 70% Wettable Powder insecticide gives excellent control of such insects as ants, cockroaches, clover mites, crickets, earwigs, fleas, flies (outdoors), millipedes, mosquitoes (outdoors), scorpions, silverfish, sowbugs, spiders, brown dog ticks, waterbugs, lawn chinch bugs, billbugs, punkies, and sand flies. It provides good flushing action of cockroaches, rapid knockdown, and long residual control of these insects. BAYGON will also control strains of cockroaches and mosquitoes resistant to certain chlorinated hydrocarbon and organophosphate insecticides. BAYGON 70% Wettable powder mixes readily with water to form a suspension which may be applied with most types of hand or power-operated sprayers. Agitate spray mixture frequently.

DIRECTIONS FOR USE

IMPORTANT: Read these entire Directions and Conditions of Sale before using BAYGON 70% Wettable Powder.

CONDITIONS OF SALE: THE DIRECTIONS ON THIS LABEL WERE DETERMINED THROUGH RESEARCH TO BE THE DIRECTIONS FOR CORRECT USE OF THIS PRODUCT. THIS PRODUCT HAS BEEN TESTED FOR A RANGE OF WEATHER CONDITIONS SIMILAR TO THOSE WEATHER CONDITIONS THAT ARE ORDINARY AND CUSTOMARY IN THE GEOGRAPHIC AREA WHERE THE PRODUCT IS USED. FAILURE TO FOLLOW THESE DIRECTIONS OR THE OCCURRENCE OF WEATHER CONDITIONS THAT ARE EXTRAORDINARY OR UNUSUAL FOR THE USE AREA MAY RESULT IN UNSATISFACTORY PERFORMANCE OF THE PRODUCT. CHEMAGRO AND THE SELLER OFFER, AND THE BUYER ACCEPTS AND USES, THIS PRODUCT SUBJECT TO THE AFOREMENTIONED CONDITIONS WHICH ARE BEYOND THE CONTROL OF CHEMAGRO AND THEREFORE THE RESPONSIBILITY OF THE BUYER.

Pest Control In and Around Homes, Apartment Buildings, Restaurants, Stores and Warehouses

Indoors: For control of ants, cockroaches, millipedes, saw-toothed grain beetle (exposed stage), silverfish, spiders, and waterbugs, mix 2 ounces BAYGON 70% Wettable Powder in 1 gallon of water (1.1% concentration) and apply as a residual spray to baseboards, window frames, the undersides of shelves and drawers, under sinks and stoves and to other places where insects may hide. Also spray cracks, crevices and surfaces where insects may crawl when they come out of hiding. Repeat as necessary. Do not spray foodstuffs or house plants. DO NOT USE AS A SPACE SPRAY.

Outdoors:
Residual Spray for ants, cockroaches, clover mites, crickets, earwigs, fleas, flies, millipedes, mosquitoes, scorpions, sowbugs, spiders, ticks, waterbugs.

Mix 2 ounces of BAYGON 70% Wettable Powder to 1 gallon of water (1.1% concentration) and apply as a residual spray or with a paint brush to surfaces of buildings, porches, screens, window frames, patios, and garages where these insects congregate. Repeat as necessary. Do not treat plants (lawns, flowering plants, shrubs, trees, etc.) with this concentration.

To control sand flies or punkies (*Culicoides spp.*), mix 2 ounces BAYGON 70% Wettable Powder in 1 quart of water (4.5% concentration) and apply with a paint brush to outside surfaces of door and window screens and other screened areas where insects may enter buildings. Thorough coverage is necessary for maximum control.

Pest Control in Meat Packing and Food Processing Plants, Food Storage Areas and Restaurants and other Food Handling Establishments (places other than private residences in which exposed food is held, processed, prepared or served.)

For control of ants, cockroaches, millipedes, silverfish, spiders, waterbugs, and aiding in the control of saw-toothed grain beetle (exposed stage), mix 2 ounces of BAYGON 70% Wettable Powder in 1 gallon of water (1.1% concentration).

Non-Food Areas: Apply to floors, walls, ceilings, or other infested areas.

Food Areas: LIMITED TO CRACK AND CREVICE TREATMENT ONLY—Apply a small amount of material directly into cracks and crevices such as expansion joints between different elements of construction or between equipment bases, floor and wall voids, or hollow equipment legs where the insects noted above hide. Do not use this product in conduits, motor housings and electrical switch boxes.

Care should be taken to avoid depositing the product onto exposed surfaces or introducing the material into the air. Avoid contamination of food or food processing surfaces.

APPLICATIONS OF THIS PRODUCT IN THE FOOD AREAS OF FOOD HANDLING ESTABLISHMENTS, OTHER THAN AS A CRACK AND CREVICE TREATMENT, ARE NOT PERMITTED.

Spraying unloading docks and outside areas where insects congregate will aid in preventing re-infestations. Good sanitation and proper disposal of wastes is essential in any effective insect control program.

Mist Spray for Mosquitoes:
Apply 1 to 1½ ounces (0.05 to 0.07 lb. active) per acre. For mist-blower machines calibrated to deliver 100 gallons per hour traveling at a speed of 4 m.p.h. and covering a swath width of up to 350 feet, use 11¾ to 17½ pounds wettable powder per 100 gallons of water to treat 170 acres.

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Container and waste disposal.

Do not reuse empty container. Destroy it by burying with waste or burning. Stay away from smoke or fumes.

Caution.

May be harmful if swallowed or absorbed through the skin. Do not contaminate feed or food. Avoid prolonged skin contact. Wash thoroughly after using.

Symptoms of poisoning: A sense of "tightness" in the chest. Sweating. Contracted pupils. Stomach pains. Vomiting and diarrhea.

Treatment: In case of poisoning call a physician immediately. Have patient lie down and keep quiet. If swallowed, administer milk or water freely and induce vomiting by giving one dose (1/2 oz. or 15 ml.) of syrup of ipecac. If vomiting does not occur within 30 minutes, administer second dose. If syrup of ipecac is not available, induce vomiting by sticking finger down throat. Repeat until vomit fluid is clear. Professional medical assistance should be secured immediately. If on skin, remove contaminated clothing and wash skin immediately with soap and warm water. If eyes are contaminated, wash with flowing water for at least 15 minutes.

To physician.

Antidote—Administer atropine sulfate in large therapeutic doses. Repeat as necessary to the point of tolerance.

BAYGON is a Reg. TM of the Parent Company of Farbenfabriken Bayer GmbH, Leverkusen

777270

Baygon

2% Bait Insecticide

for effective control of cockroaches and crickets.

ACTIVE INGREDIENT:	
2-(1-Methylethoxy) phenol methylcarbamate†	2%
INERT INGREDIENTS:	98%
	100%

†U.S. Patent No. 3,111,539
Canadian Patent No. 725,204

EPA Reg. No. 3125-121-ZA

EPA Est. 3125-MO-1

STOP—Read the label before use.

CAUTION.

Keep out of reach of children.

(See rear panel for caution statements.)

NET WEIGHT 5 POUNDS

Chemagro Agricultural Division
Mobay Chemical Corporation
Box 4913, Kansas City, Mo. 64120

Aviso.

AL USUARIO: Si usted no puede entender inglés, no use este produ hasta que la etiqueta le haya sido explicada ampliamente.

(TO THE USER: If you cannot read understand English, do not use this p until the label has been fully explaine you.)

Directions for use. Important.

Read these entire Directions and Conditions of Sale before using BAY 2% Bait.

Conditions of sale.

The directions on this label we determined through research to t the directions for correct use of t product. This product has been te for a range of weather conditions similar to those weather conditio that are ordinary and customary i geographic area where the produ used. Insufficient control of pest result from the occurrence of extraordinary or unusual weather from failure to follow label directi In addition, failure to follow label directions may cause injury to th to which the product is applied, o crops, animals, man, or the envir ment. Chemagro and the seller of and the buyer accepts and uses, this product subject to the condit that extraordinary or unusual wea or failure to follow label direction beyond the control of Chemagro are, therefore, the responsibility o buyer.

Aviso.

AL USUARIO: Si usted no puede leer o entender inglés, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

(TO THE USER: If you cannot read or understand English, do not use this product until the label has been fully explained to you.)

Directions for use. Important.

Read these entire Directions and Conditions of Sale before using BAYGON 2% Bait.

Conditions of sale.

The directions on this label were determined through research to be the directions for correct use of this product. This product has been tested for a range of weather conditions similar to those weather conditions that are ordinary and customary in the geographic area where the product is used. Insufficient control of pests may result from the occurrence of extraordinary or unusual weather, or from failure to follow label directions. In addition, failure to follow label directions may cause injury to the crop to which the product is applied, other crops, animals, man, or the environment. Chemagro and the seller offer, and the buyer accepts and uses, this product subject to the conditions that extraordinary or unusual weather, or failure to follow label directions are beyond the control of Chemagro and are, therefore, the responsibility of the buyer.

BAYGON 2% Bait insecticide, a ready-to-use product, is very effective for the control of crickets and the following cockroaches listed below. It gives rapid kill of these insects including those resistant to certain chlorinated hydrocarbon and phosphate insecticides. Crickets and roaches die quickly after feeding on the bait.

Cockroaches: American, Brown, Brown banded, German, and oriental roaches.

Crickets.

For use in and around homes, apartment buildings, stores, restaurants (non-food areas) and warehouses. Apply bait lightly to floors near baseboards, in closets, under sinks and refrigerators, around and inside garbage cans, and in other areas where insects are found but which are inaccessible to children such as cracks and crevices. Do not apply to animals. Do not treat portions of buildings where animals can feed on bait. Use approximately 4 ounces of bait per 1,000 sq. ft. of space and scatter lightly so that bait is barely visible. Repeat as necessary. Keep out of reach of children.

For use by Pest Control Operators in restaurants (food areas), poultry-packing, red meat packing and food processing plants, including plants that are federally inspected. Apply bait on paper, pasteboard, or other material that will permit removal. Locate these bait stations on window sills, on floor near walls, in storage areas and other areas where insects have been observed. Maintain strict account of location and number of bait stations. Do not apply bait in edible product areas until operations have ceased for the day. Remove all bait stations from the edible products areas before resuming operations.

For use in research facilities. The use of BAYGON in and around research animal quarters for pest control will not induce changes in liver microsomal enzyme activity in these animals. BAYGON 2% Bait should not be applied directly on animals or applied where animals can feed on the bait.

For outdoor use around flower gardens, patios, driveways, sidewalks and foundations. Apply bait evenly in a 2 to 3 feet wide band at the rate of 4-oz./1,000 sq. ft. around foundations, patios, driveways or sidewalks, taking care to treat any cracks or crevices. For maximum effectiveness treat beneath concrete drain splashpans. For applications in or around flower gardens scatter bait at the rate of 4-oz./1,000 sq. ft. as a broadcast or apply a protective barrier around the garden as a 1 foot wide band.

Fish and wildlife cautions.

This product is toxic to fish, birds and other wildlife. Birds and other wildlife in treated areas may be killed. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as specified on this label.

Restrictions.

Do not apply to floors or other surfaces likely to be contacted by children or pets.

Propoxur environmental fate review

Page 53 is not included in this copy.

Pages _____ through _____ are not included in this copy.

The material not included contains the following type of information:

___ Identity of product inert ingredients

___ Identity of product impurities

___ Description of the product manufacturing process

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___ A draft product label

___ The product confidential statement of formula

___ Information about a pending registration action

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