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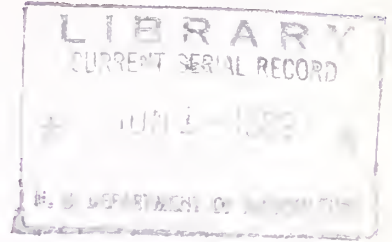
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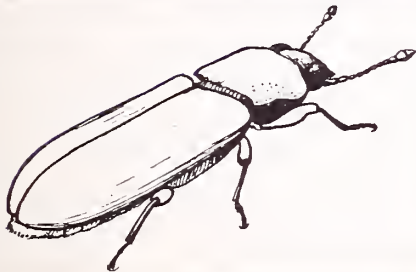
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Laboratory Evaluation of
Promising Compounds as
Repellents to Flour Beetles,
Tribolium Spp.



Marketing Research Division
Agricultural Marketing Service
U. S. DEPARTMENT OF AGRICULTURE

PREFACE

This report is based on a study of various chemicals as repellents for possible use in insect-resistant packaging materials. Results of similar tests of other chemicals will be published as the tests are completed. The study is part of a broad program of continuing research designed to reduce marketing costs and expand the market for farm products.

The performance data on the chemicals included in this report were assembled and tabulated by R. H. Guy, Stored-Product Insects Laboratory, Savannah, Ga.

Several past and present members of the staff of the Stored-Product Insects Laboratory, Savannah, Ga., have participated in this evaluation program. The program since its inception has been under the general direction of Hamilton Laudani, formerly Savannah Station leader and now assistant head, Stored-Product Insects Section, Agricultural Marketing Service, Beltsville, Md. F. O. Marzke, W. J. Patterson, D. F. Davis, H. T. Vanderford, G. W. Angalet, R. W. Lapsley, G. R. Swank, and R. H. Guy were responsible for the laboratory work described. They were assisted by L. L. McDonald, P. G. Mahany, and Charles Metts.

An evaluation program, such as described in this report, could not have been conducted without the chemical synthesis programs of Government and industry laboratories. The majority of the compounds were synthesized by S. I. Gertler and W. F. Barthel of the Pesticide Chemicals Research Laboratories, Entomology Research Division, Agricultural Research Service, Beltsville, Md. R. W. Ihndris verified the nomenclature of the compounds. The Orlando, Fla., laboratory, Insects Affecting Man Section, Agricultural Research Service, rendered valuable assistance by making available samples of compounds found to be effective repellents in their screening program.

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April 1959

SUMMARY

This report presents the results of preliminary laboratory evaluation tests made with 534 experimental compounds to determine their efficacy as repellents against stored-product insects. The studies were conducted at the Savannah, Ga., laboratory as part of a research program on the development of insect-resistant packaging to find additional materials other than pyrethrum, the only chemical approved for package treatment by the Food and Drug Administration at the present time.

N-pentylphthalimide applied at 200 mg. per square foot was the only compound that produced a repellency greater than that of the standard treatment, and 11 additional treatments are considered to produce a repellent action comparable with that produced by the standard.

The laboratory technique used in the evaluation of these experimental compounds and its development were described in detail in a previous report, therefore only a brief account of the method is given in this report. The insects used in the repellency tests were 3- to 28-day-old adults from mixed cultures containing the confused flour beetle, Tribolium confusum Duv. and the red flour beetle, T. castaneum (Hbst.). Previous work has shown that these two species behave identically within the limits of these tests. A standard of paper treated with synergized pyrethrum at the rate of 10 mg. of pyrethrum and 100 mg. of piperonyl butoxide per square foot was used in all tests for comparative purposes.

LABORATORY EVALUATION OF PROMISING COMPOUNDS AS REPELLENTS TO FLOUR BEETLES, TRIBOLIUM SPP.

Stored-Product Insects Laboratory
Savannah, Georgia¹

INTRODUCTION

The Stored-Product Insects Laboratory, Savannah, Ga., for the past 7 years has been engaged in research on the development of insect-resistant packaging. During this time a sound appreciation has been developed of the important factors which influence the improvement of the insect resistance of food packaging. These factors were discussed in detail by Laudani and Davis² in a review of the program. One of the factors discussed was the advisability of finding additional materials other than pyrethrum, which at the present time is the only chemical approved for package treatment by the Food and Drug Administration. The supply of pyrethrum in this country is dependent on foreign sources, and the material is very expensive, has a relatively short life, and is difficult to analyze.

A continuous phase of this research project on the development of insect-resistant packaging is the preliminary evaluation of experimental compounds to determine their efficacy as repellents against stored-product insects. The materials to be tested are obtained from various sources, but only those compounds showing some promise as repellents in previous tests are included in the tests conducted at Savannah. Primarily, these sources consist of the synthesis program of the Beltsville, Md., laboratory of the Pesticide Chemicals Research Laboratories, Agricultural Research Service; the Orlando, Fla., laboratory of the Insects Affecting Man Section, Agricultural Research Service; and various companies in the pesticide chemicals industry.

This report presents the results of these laboratory evaluation tests from the time of their initiation until the present. During this period a total of 534 compounds has been tested.

The laboratory technique used in the evaluation of these experimental compounds and its development were described in detail by Laudani and others.³ A brief account of the method is given herein, but the reader is urged to examine the indicated reference for a better understanding of the technique.

PROCEDURE

The insects used in the repellency tests were 3- to 28-day-old adults from mixed cultures containing the confused flour beetle, Tribolium confusum Duval, and the red flour beetle, T. castaneum (Herbst). Previous work has shown that these two species behave identically within the limits of these tests. The culture medium used for rearing the test insects consisted of 50 percent of flour, 45 percent of corn meal, and 5 percent of brewer's yeast. The rearing was conducted in a room in which the temperature was maintained at $80^{\circ} \pm 2^{\circ}$ F. and the relative humidity at 60 ± 5 percent.

The repellent compounds were applied in acetone solutions. They were prepared by adding to a known volume of solvent the required amount of the compound to give the deposit desired when 3 ml. of the solution was applied to a 4- by 16-inch strip of test paper. The material was applied with an automatic blade applicator (fig. 1). After treatment, the papers were labeled and allowed to dry for 4 days before they were used in the tests.

¹ This is one of the field stations of the Stored-Product Insects Section, Biological Sciences Branch, Marketing Research Division, Agricultural Marketing Service, U. S. Department of Agriculture.

² Laudani, Hamilton, and Davis, D. F. The Status of Federal Research on the Development of Insect-Resistant Packages. Tappi 38(6): 322-326, 1955.

³ Laudani, Hamilton, Davis, D. F., and Swank, G. R. A Laboratory Method of Evaluating the Repellency of Treated Paper to Stored-Product Insects. Tappi 38(6):336-341. 1955.



N-26961

Figure 1. --Application of acetone solutions of experimental chemicals to kraft paper with an automatic blade applicator.

The repellency-test sheets consisted of a strip of treated paper and a strip of untreated paper joined edge-to-edge with cellulose tape on the bottom side. The joined strips were then cut into two sections, each being 8 inches long and approximately 7 inches wide. The two sections were placed on a table so that the treated half of one was turned to the right and the treated half of the other turned to the left, to counteract any undetermined external influences on the distribution of the insects (fig. 2). Two glass cylinders were placed on each of the two sections of paper. The cylinders were positioned so that the seam joining the treated and untreated papers formed the diameter of the test arena, thus providing equal areas of treated and untreated paper.

The glass cylinders used to confine the test insects on the repellency arenas were oil-cup glasses which measured 3 inches in height and 3 inches in outside diameter, and were made of 3/16-inch-thick glass. Each end of these cylinders was machined smooth; and therefore, either end could be placed on the paper to produce an insect-tight union. These oil-cup glasses had sufficient weight to press down folds that were present in some of the treated papers.

Each new series of repellency tests was begun on Monday morning and continued through 5 days, with 10 adult flour beetles in each glass cylinder. Counts were made twice daily to determine the number of insects on the treated and untreated paper in each arena.



BN-7330

Figure 2. --Laboratory technique for determining the repellency to flour beetle adults of chemicals applied to kraft paper. Note test arenas composed half of treated paper and half of untreated paper.

Therefore, the data obtained amount to 10 readings of 4 replications or 400 individual insect positions for each treatment. Inactive or dead insects were disregarded, and were replaced with active ones. The average was determined for each reading of the 4 cylinders, and at the end of the fifth day the average for the daily readings was determined. This average was then converted to the percentages of the insects which were counted on the two surfaces.

Four aging tests were conducted with the same papers to determine the persistency of the repellent action produced by the various treatments. These tests were conducted according to the procedure used in the initial tests and the results were tabulated and presented in the same manner. Aging tests were conducted for 5-day periods beginning 2 weeks, 1, 2, and 3 months following the applications.

Untreated checks were included in each series of repellency tests. The preparation of and the techniques used with the untreated check sheets were identical to those described above except that neither half of the paper was treated. On the untreated checks, counts were made of the number of insects on each side of the seam. The reliability of the test was dependent on obtaining a 50-50 normal distribution on the two halves of the untreated check. The readings for the untreated check arenas were tabulated as 50 percent plus or minus the deviations from the 50-50 distribution.

A standard was used in all tests for comparative purposes. This standard consisted of paper treated with synergized pyrethrum at the rate of 10 mg. of pyrethrum and 100 mg. of piperonyl butoxide per square foot.

EVALUATION OF RESULTS

The percentage value shown in the appendix for each of the treatments represents the average number of test insects counted on the untreated half of the repellency arena during the initial 5-day period and the 4 aging-test periods. The figures for the untreated portion of the arena were selected for presentation in order that high values would be associated with greater repellency. These figures have been converted to express percent repellency or attractancy by doubling the difference between the percentage of insects counted on the untreated half and the 50-percent expected distribution. The positive figures (+) express repellency and the negative figures (-) attractancy. The "percent repellency" values are expressed on a scale consisting of the following five categories: Class 0, all negative values (no repellency); Class I, from 0.1 to 20 percent repellency; Class II, from 20.1 to 40 percent repellency; Class III, from 40.1 to 60 percent repellency; Class IV, from 60.1 to 80 percent repellency; and Class V, from 80.1 to 100 percent repellency.

Many of the 534 compounds were evaluated at several rates of application. Each application was considered an entity and for each the percent repellency value and classification were designated. Based on this method of treating the results of these evaluation tests, the number of treatments assigned to each of the repellency categories was:

Class 0.....	193 treatments
Class I.....	432 treatments
Class II.....	236 treatments
Class III.....	54 treatments
Class IV.....	11 treatments
Class V.....	1 treatment

The one treatment designated in the Class V category was N-pentylphthalimide applied at 200 mg./sq. ft. The results obtained with this compound were described by Swank and others.⁴ Of all compounds tested, this is the only one which has produced a repellency greater than that of the standard used for comparison.

The 11 treatments designated in the Class IV category were (in order of decreasing effectiveness):

<u>Compound</u>	<u>Rate of application</u> <u>Mg./sq. ft.</u>
1. Phthalimide, <u>N</u> -pentyl-.....	100
2. Ether, 2,4-dinitrophenyl phenyl.....	100
3. Phenol, 2,3,5,6-tetrachloro-.....	200
4. (2 above).....	50
5. (2 above).....	200
6. 1-Piperidineacetic acid, cyclohexyl ester.....	200
7. 1,4-Cyclohexanedicarboxylic acid, diallyl ester.....	200
8. Glutaramic acid, <u>N,N</u> -diisopropyl-, propyl ester.....	100
9. (2 above).....	25
10. (6 above).....	100
11. Benzamide, <u>m</u> -chloro- <u>N,N</u> -diethyl-.....	200

As the standard used for comparison always is classified in the Class IV category according to the test method used, all of the compounds listed above are considered to produce a repellent action comparable with that produced by the standard.

⁴ Swank, G. R., Davis, D. F., and Gertler, S. I., N-pentylphthalimide as a repellent for possible use on insect-resistant packaging. Jour. Econ. Ent. 50(4):515-516. 1957.

Recently there has been considerable interest in insect attractants. The test technique as described in this report permits evaluation of attractancy of the chemicals as well as the repellency. In the tabulation of results, negative percentage values indicate that the flour beetle adults were attracted to the treated surface, the higher negative value indicating greater attractancy. Based on this interpretation of the results, the following compounds were designated the most effective attractants (in order of decreasing effectiveness):

1. Phthalic acid, diisopropyl ester
2. 5-m-Dioxanol, 2-(1-ethylpropyl)- and 1, 3-Dioxolane-4-methanol, 2-(1-ethylpropyl)-
3. Naph[2, 3-c]acridine-5, 8, 14-(13)trione, 11-chloromethyl-10-methyl-, 1, 1, 3-trimethylisothiuronium salt
4. Benzyl alcohol, alpha-(trichloromethyl)-
5. Propionic acid, 3-(2-ethoxyethoxy)-, 2-ethoxyethyl ester
6. Valerophenone, 4-methoxy-
7. Lactic acid, tetrahydrofurfuryl ester, ethyl carbonate
8. 5-m-Dioxanol, 2-(1-ethylpentyl)-
9. Acetic acid, cyano-, 3-methylcyclohexyl ester
10. Chrysanthemumamide, N-3-(isopropylaminopropyl)-

The Department of Agriculture intends to publish progressive supplementary reports of the results of the program on preliminary evaluation of the repellency of experimental chemical compounds to stored-product insects.

APPENDIX

Chemicals Tested and Results of Tests

Item No.	ENT-No. ¹	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
1----	19920	Abietic acid, allethrolonyl ester	10	-10.2	0
2----	8606	Acetamide, 2,2,2-trichloro- <u>N</u> -(2-chloroethyl)-	10	10.2	I
3----	7706	Acetamide, 2-benzyloxy- <u>N</u> -dodecyl-	10	37.0	II
			25	15.0	I
			50	17.6	I
			100	39.4	II
			200	45.4	III
4----	925	Acetamide, 2-butoxy- <u>N</u> -pentyl-	10	-1.4	0
5----	19514	Acetamide, <u>N</u> -butyl- <u>N</u> -cyclohexyl-	10	14.1	I
6----	16741	Acetamide, <u>N</u> -butyl- <u>N</u> -2-methylcyclohexyl-	10	26.5	II
			25	19.1	I
			50	-0.6	0
			100	4.2	I
			200	23.3	II
7----	14806	Acetamide, <u>N</u> -butyl-2,2,2-trichloro-	10	6.1	I
8----	6605	Acetamide, 2-cyclohexyloxy- <u>N</u> , <u>N</u> -diethyl-	10	0.2	I
9----	5508	Acetamide, <u>N</u> , <u>N</u> -diisopentyl-	10	11.8	I
10----	15235	Acetamide, <u>N</u> -octyl-	10	4.6	I
11----	2484	Acetanilide, <u>N</u> -butyl-	10	0.8	I
12----	5523	Acetanilide, <u>N</u> -ethyl-	10	14.2	I
13----	5524	Acetanilide, <u>N</u> -propyl-	10	2.7	I
14----	15998	Acetanilide, 4'-chloro- <u>N</u> -ethyl-	10	35.3	II
			25	33.0	II
			50	12.8	I
			100	4.6	I
			200	44.2	III
15----	7178	Acetic acid, chloro-, tetrahydrofurfuryl ester	10	17.7	I

¹Code number assigned by Entomology Research Division, Agricultural Research Service, to compounds distributed for screening.

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
16----	7187	Acetic acid, cyano-, cyclohexyl ester	10	-5.9	0
17----	7370	Acetic acid, cyano-, 3-methylcyclohexyl ester	10	27.2	II
			25	-11.0	0
			50	-16.8	0
			100	-21.2	0
18----	7371	Acetic acid, cyano-, 4-methylcyclohexyl ester	10	32.6	II
			25	3.8	I
			50	21.2	II
			100	13.4	I
19----	5831	Acetic acid, (cyano)phenyl-, ethyl ester	10	3.5	I
20----	6238	Acetic acid, (1-hydroxy-1-methylethoxy)phenyl-, <u>gamma</u> -lactone	10	7.8	I
21----	6295	Acetic acid, phenoxy-	10	12.9	I
22----	2002	Acetic acid, phenoxy-, 2-ethoxyethyl ester	10	22.8	II
			25	-6.4	0
			50	13.6	I
			100	33.3	II
			200	51.2	III
23----	6555	Acetoacetamide, <u>N</u> , <u>N</u> -dibutyl-	10	34.7	II
			25	-8.2	0
			50	-0.2	0
			100	0.7	I
			200	-5.2	0
24----	6569	Acetoacetamide, <u>N</u> , <u>N</u> -diethyl-	10	13.8	I
25----	6565	Acetoacetamide, <u>N</u> , <u>N</u> -diisobutyl-	10	1.6	I
26----	7790	Acetoacetic acid, 2-benzyl-, ethyl ester	10	0.3	I
27----	6231	Acetoacetic acid, phenethyl ester	10	25.1	II
28----	479	Acetophenone, 3', 4'-dichloro-	10	4.7	I
29----	227	Acetophenone, 4'-methoxy-	10	-0.6	0
30----	12037	<u>o</u> -Acetotoluidide, <u>N</u> -ethyl-	10	31.4	II
			25	28.0	II
			50	30.0	II
			100	38.6	II
			200	28.2	II

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
31----	12041	<u>p</u> -Acetotoluidide, <u>N</u> -ethyl-	10	2.4	I
32----	3200	Acrylic acid, 2-benzyl-oxyethyl ester	10	7.0	I
33----	10548	Acrylic acid, 3-benzoyl-, ethyl ester	10	-14.7	0
34----	3193	Acrylic acid, 2-(2-butoxyethoxy)ethyl ester	10	5.1	I
35----	15690	Acrylic acid, 3-(dibutylamino)-propyl ester	10	11.3	I
36----	15729	Acrylic acid, <u>p</u> -chloro-phenyl ester	10	-14.8	0
37----	8322	Adipic acid methyl "heelate" reaction product	10 25 50 100 200	43.9 34.1 21.1 45.7 43.7	III II II III III
38----	342	Adipic acid, diethyl ester	10	17.8	I
39----	6487	Adipamic acid, <u>N</u> , <u>N</u> -diethyl-, methyl ester	10	-2.1	0
40----	6484	Adipamic acid, <u>N</u> , <u>N</u> -diisopropyl-, methyl ester	10	-1.2	0
41----	20047	Allethrolone	10	11.4	I
42----	3464	Ammonium compound, benzyl-hexadecyldimethyl---chloride	10	14.9	I
43----	14640	Aniline, 3,5-dibromo-	10	-0.9	0
44----	10028	Aniline, <u>N</u> -allyl-	10 25 50 100 200	48.7 36.0 39.2 41.2 46.2	III II II III III
45----	20216	<u>o</u> -Anisamide, <u>N</u> , <u>N</u> -diethyl-	10	7.9	I
46----	23818	<u>p</u> -Anisic acid, diester with resorcinol	10	7.8	I
47----	6107	<u>p</u> -Anisic acid, isobutyl ester	10	25.8	II
48----	229	<u>p</u> -Anisic acid, methyl ester	10	26.0	II

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
49----	17152	<u>p</u> -Anisic acid, <u>p</u> -ethylphenyl ester	10	24.0	II
			25	29.5	II
			50	20.8	II
			100	37.2	II
			200	46.4	III
50----	189	Anisole, <u>p</u> -nitro-	10	-7.4	0
51----	2377	Anthranilic acid, ethyl ester	10	22.7	II
			25	-10.4	0
			50	-11.6	0
			100	-16.4	0
			200	-9.1	0
52----	1022	Anthranilic acid, methyl ester	10	15.5	I
53----	5913	Anthranilic acid, <u>N</u> -methyl- <u>N</u> -propionyl-, methyl ester	10	3.9	I
54----	3444	Anthranilic acid, <u>sec</u> -butyl ester	10	17.3	I
55----	6080	Azalaic acid, dimethyl ester	10	14.3	I
56----	2069	Benzaldehyde, 3,4-diethoxy-	10	18.9	I
57----	19307	Benzaldehyde, 2,5-dimethoxy-	10	1.5	I
58----	5712	Benzaldehyde, <u>p</u> -butoxy-	10	-7.3	0
59----	20299	Benzamide, <u>o</u> -bromo- <u>N,N</u> -diethyl-	10	5.0	I
60----	20701	Benzamide, <u>m</u> -chloro- <u>N,N</u> -diethyl-	10	23.6	II
			25	9.9	I
			50	21.6	II
			100	38.2	II
			200	60.6	IV
61----	14147	Benzamide, <u>o</u> -chloro- <u>N,N</u> -diethyl-	10	9.9	I
62----	20595	Benzamide, <u>N,N</u> -diethyl- <u>p</u> -isopropyl-	10	20.0	I
63----	20297	Benzamide, <u>o</u> -ethoxy- <u>N,N</u> -diethyl-	10	13.7	I
			12.5	4.4	I
			25	2.4	I
			50	-13.4	0
			100	-1.9	0
64----	19089	Benzamide, <u>o</u> -ethoxy- <u>N</u> -isobutyl-	10	14.3	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
65----	845	Benzene, <u>m</u> -dimethoxy-	10	17.4	I
66----	2913	Benzene, <u>m</u> -dinitro-	10	23.4	II
67----	15487	Benzene, (2-nitropropenyl)-	10	0.7	0
68----	3710	Benzoic acid	10	-2.2	0
69----	8490	Benzoic acid, <u>o</u> -acetyl-, ethyl ester	10	27.2	II
			25	-8.6	0
			50	-9.4	0
			100	14.4	I
			200	31.2	II
70----	7043	Benzoic acid, 3-butynyl ester	10	10.5	I
71----	15531	Benzoic acid, <u>o</u> -(1-hydroxyethylmercapto)-, lactone	10	-6.0	0
72----	488	Benzonitrile, <u>p</u> -bromo-	10	21.5	II
73----	19563	2-(3)-Benzoxazolone	10	-17.9	0
74----	13042	Benzyl alcohol, <u>alpha</u> -(allyloxymethyl)-	10	20.7	II
			25	22.0	II
			50	17.4	I
			100	25.8	II
75----	5756	Benzyl alcohol, <u>o</u> -butoxy-	10	10.8	I
76----	5883	Benzyl alcohol, <u>p</u> - <u>sec</u> -butoxy-	10	17.5	I
77----	20553	Benzyl alcohol, 3,4-dichloro-	10	0.2	I
78----	5869	Benzyl alcohol, <u>o</u> -hexyloxy-	10	5.3	I
79----	5844	Benzyl alcohol, <u>p</u> -isopentyloxy-	10	8.9	I
80----	5713	Benzyl alcohol, <u>p</u> -(2-methylallyloxy)-	10	15.7	I
81----	5519	Benzyl alcohol, <u>p</u> -propoxy-	10	32.0	II
			25	21.2	II
			50	21.8	II
			100	37.4	II
			200	38.3	II
82----	6503	Benzyl alcohol, <u>alpha</u> -propoxymethyl-	10	-4.9	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
83----	4634	Benzyl alcohol, <u>alpha</u> - (trichloromethyl)-	10	24.4	II
			25	-8.9	0
			50	-20.8	0
			100	-25.7	0
			200	-20.6	0
84----	4132	Bicyclo(2.2.1)hept-5-ene- 2,3-dicarboxylic acid, diethyl ester	10	1.0	I
85----	3916	Bicyclo(2.2.1)hept-5-ene- 2,3-dicarboxylic acid, <u>cis</u> -, dimethyl ester (Dimethyl carbate)	10	-2.6	0
86----	8991	Bicyclo(2.2.1)hept-5- ene-2,3-dicarboxylic acid, <u>trans</u> -, dimethyl ester	10	5.5	I
87----	15018	Butanephosphonic acid, dibutyl ester	10	27.5	II
			25	8.4	I
			50	18.6	I
			100	32.0	II
			200	48.8	III
88----	5903	2-Butanol, 4- <u>p</u> - methoxyphenyl-	10	11.1	I
89----	20034	3-Buten-1-ol, 1-(<u>o</u> - methoxyphenyl)-	10	-6.9	0
90----	5926	Butyraldehyde, 2-(2- cyanoethyl)-2-ethyl-	10	26.9	II
			25	4.2	I
			50	16.1	I
			100	31.4	II
			200	24.6	II
91----	3369	Butyramide, 2,2-dichloro-	10	12.8	I
92----	5796	Butyranilide, <u>N</u> -butyl-	10	-1.8	0
93----	12036	Butyranilide, <u>N</u> -propyl-	10	-8.7	0
94----	10577	Butyric acid, benzoylmethyl ester	10	2.5	I
95----	7451	Butyric acid, 2-cyano-, cyclohexyl ester	10	27.4	II
			25	7.2	I
			50	11.0	I
			100	6.2	I
			200	10.4	I
96----	7087	Butyric acid, diester with 2-ethyl-2-nitro-1,3- propanediol	10	16.8	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
97----	18402	Butyric acid, 2,4-dinitrophenyl ester	10	3.7	I
98----	6315	Butyric acid, ester with <u>N</u> -butyl- <u>N</u> -(2-hydroxyethyl) butyramide	10	9.5	I
99----	1456	Butyric acid, 2-ethyl-, diester with triethylene glycol	10	35.8	II
			25	-4.6	0
			50	-5.6	0
			100	5.4	I
			200	21.1	II
100----	13047	Butyric acid, 2-(2-hydroxyethoxy)ethyl ester	10	26.2	II
			25	17.8	I
			50	12.7	I
			100	30.8	II
			200	42.3	III
101----	6221	Butyric acid, 3-hydroxy-3-phenyl-, ethyl ester	10	25.1	II
			25	9.0	I
			50	-7.8	0
			100	26.2	II
			200	30.2	II
102----	6222	Butyric acid, 3-hydroxy-3-phenyl-, propyl ester	10	18.3	I
103----	4096	Butyrophenone, 4'-chloro-	10	1.6	I
104----	5514	Butyrophenone, 4'-methoxy-	10	27.6	II
			25	-11.7	0
			50	-14.7	0
			100	-10.2	0
			200	8.6	I
105----	15077	Carbanilic acid, methyl ester	10	-2.5	0
106----	19673	9-Carbazole, <u>N</u> -chrysanthemummonocarbonyl-	10	17.8	I
107----	7274	Carbonic acid, <u>p</u> -bromophenyl ethyl ester	10	4.1	I
108----	3439	Carvacrol, chloro-	10	43.0	III
			25	24.3	II
			50	41.4	III
			100	30.8	II
			200	41.4	III
109----	3995	Catechol	10	16.9	I
110----	19151	Chrysanthemumamide, <u>N</u> -allyl-	10	2.8	I

Item No.	ENT -No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
111----	19675	Chrysanthemumamide, <u>N</u> -butyl-	10	14.0	I
112----	19825	Chrysanthemumamide, <u>N</u> -cyclohexyl-	10	-2.2	0
113----	19921	Chrysanthemumamide, <u>N</u> , <u>N</u> -diallyl-	10	-12.0	0
114----	19831	Chrysanthemumamide, <u>N</u> , <u>N</u> -diisopropyl-	10	-16.6	0
115----	19826	Chrysanthemumamide, <u>N</u> -3-(dimethylaminopropyl)-	10	-10.4	0
116----	19676	Chrysanthemumamide, <u>N</u> , <u>N</u> -dioctyl-	10	-7.6	0
117----	19680	Chrysanthemumamide, <u>N</u> , <u>N</u> -dipentyl-	10	-16.0	0
118----	19672	Chrysanthemumamide, <u>N</u> , <u>N</u> -diphenyl-	10	16.8	I
119----	19830	Chrysanthemumamide, <u>N</u> , <u>N</u> -dipropyl-	10	-7.8	0
120----	19679	Chrysanthemumamide, <u>N</u> -heptyl-	10	1.8	I
121----	19674	Chrysanthemumamide, <u>N</u> -isobutyl-	10	6.8	I
122----	19827	Chrysanthemumamide, <u>N</u> -3-(isopropylamino- propyl)-	10	-20.8	0
123----	19828	Chrysanthemumamide, <u>N</u> -isopropoxypropyl-	10	-3.6	0
124----	19829	Chrysanthemumamide, <u>N</u> -(<u>alpha</u> -methylbenzyl)-	10	6.6	I
125----	19681	Chrysanthemumamide, <u>N</u> -1-methylbutyl-	10	-0.8	0
126----	19678	Chrysanthemumamide, <u>N</u> -1-methylpentyl-	10	-8.2	0
127----	19677	Chrysanthemumamide, <u>N</u> -octyl-	10	-15.8	0
128----	19682	Chrysanthemumamide, <u>N</u> -pentyl-	10	-2.6	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
129----	20453	Chrysanthemumic acid	10	-14.0	0
130----	19416	Chrysanthemumic acid, <u>p</u> -acetylphenyl ester	10	13.2	I
131----	19415	Chrysanthemumic acid, <u>p</u> -benzoylphenyl ester	10	6.2	I
132----	19156	Chrysanthemumic acid, <u>x</u> -benzylisoeugenyl ester	10	19.4	I
			25	8.0	I
			50	10.0	I
			100	3.4	I
			200	5.3	I
133----	19157	Chrysanthemumic acid, diester with 1, 3-butenediol	10	12.2	I
134----	19004	Chrysanthemumic acid, 2-(2-butoxyethoxy)ethyl ester	10	-7.6	0
135----	19006	Chrysanthemumic acid, 2-butoxyethyl ester	10	-11.4	0
136----	19153	Chrysanthemumic acid, 2- <u>sec</u> -butylcyclohexyl ester	10	5.6	I
137----	19154	Chrysanthemumic acid, <u>p</u> - <u>tert</u> -butylphenyl ester	10	15.6	I
138----	19395	Chrysanthemumic acid, diester with catechol	10	12.2	I
139----	19123	Chrysanthemumic acid, 2-chloroethyl ester	10	9.8	I
140----	19396	Chrysanthemumic acid, 6-chloro-2-methylphenyl ester	10	10.8	I
141----	19397	Chrysanthemumic acid, 4-chloro-2-methylphenyl ester	10	6.4	I
142----	19159	Chrysanthemumic acid, <u>o</u> -chlorophenyl ester	10	10.0	I
143----	19160	Chrysanthemumic acid, <u>p</u> -chlorophenyl ester	10	12.0	I
144----	19398	Chrysanthemumic acid, cholesteryl ester	10	-10.4	0
145----	19401	Chrysanthemumic acid, 2-cyclohexylcyclohexyl ester	10	14.4	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
146----	19400	Chrysanthemumic acid, 4-cyclohexylcyclohexyl ester	10	5.8	I
147----	19399	Chrysanthemumic acid, 2-cyclohexylethyl ester	10	0	0
148----	19407	Chrysanthemumic acid, decyl ester	10	8.6	I
149----	19559	Chrysanthemumic acid, 2-diethylaminoethyl ester	10	19.8	I
150----	30961	Chrysanthemumic acid, 2-dimethylaminoethyl ester	10	15.6	I
151----	19167	Chrysanthemumic acid, diester with 2,5-dimethyl-3-hexyne-2,5-diol	10	10.2	I
152----	19409	Chrysanthemumic acid, dodecyl ester	10	10.6	I
153----	19003	Chrysanthemumic acid, 2-(2-ethoxyethoxy)ethyl ester	10	-0.6	0
154----	19001	Chrysanthemumic acid, 2-ethoxyethyl ester	10	-6.2	0
155----	19403	Chrysanthemumic acid, 2-ethylbutyl ester	10	6.4	I
156----	19420	Chrysanthemumic acid, diester with 2-ethyl-1,3-hexanediol	10	1.4	I
157----	19404	Chrysanthemumic acid, 1-ethylpentyl ester	10	5.4	I
158----	19118	Chrysanthemumic acid, eugenyl ester	10	11.8	I
159----	19408	Chrysanthemumic acid, fenchyl ester	10	12.4	I
160----	19402	Chrysanthemumic acid, furfuryl ester	10	-0.2	0
161----	19410	Chrysanthemumic acid, hexadecyl ester	10	-3.0	0
162----	19406	Chrysanthemumic acid, 1-isobutylisopentyl ester	10	7.2	I
163----	19117	Chrysanthemumic acid, <u>cis</u> -isoeugenyl ester	10	11.0	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
164----	19468	Chrysanthemumic acid, 2-(<u>p</u> -isopropylphenyl)ethyl ester	10	22.2	II
			25	14.8	I
			50	14.8	I
			100	10.8	I
			200	34.2	II
165----	19002	Chrysanthemumic acid, 2-(2-methoxyethoxy)ethyl ester	10	-0.2	0
166----	19005	Chrysanthemumic acid, 2-methoxyethyl ester	10	-8.6	0
167----	19163	Chrysanthemumic acid, <u>m</u> -methoxyphenyl ester	10	11.6	I
168----	19113	Chrysanthemumic acid, <u>p</u> -methoxyphenyl ester	10	13.0	I
169----	19903	Chrysanthemumic acid, ester with 4-methylumbelliferone	10	-3.8	0
170----	19463	Chrysanthemumic acid, 2-methyl-2-nitropropyl ester	10	11.6	I
171----	19120	Chrysanthemumic acid, 2-methylallyl ester	10	8.8	I
172----	19558	Chrysanthemumic acid, 2-(4-morpholinyl)ethyl ester	10	11.8	I
173----	19124	Chrysanthemumic acid, 1-naphthyl ester	10	24.4	II
			25	15.6	I
			50	18.2	I
			100	21.5	II
			200	25.6	II
174----	19125	Chrysanthemumic acid, 2-naphthyl ester	10	14.6	I
175----	19466	Chrysanthemumic acid, 2-nitro- <u>p</u> -tolyl ester	10	24.0	II
			25	14.0	I
			50	20.2	II
			100	20.8	II
			200	29.2	II
176----	19411	Chrysanthemumic acid, diester with 2,6-octadien-4,5-diol	10	7.2	I
177----	19405	Chrysanthemumic acid, octyl ester	10	6.0	I
178----	19155	Chrysanthemumic acid, pentyl- <u>m</u> -tolyl ester	10	8.4	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
179----	19007	Chrysanthemumic acid, 2-phenoxyethyl ester	10	4.8	I
180----	19394	Chrysanthemumic acid, 2-(<u>p-tert-butyl</u>)phenoxyethyl ester	10 25 50 100 200	31.4 18.2 22.7 30.2 38.6	II I II II II
181----	19467	Chrysanthemumic acid, 1-phenylethyl ester	10	11.8	I
182----	19119	Chrysanthemumic acid, propynyl ester	10	5.0	I
183----	19412	Chrysanthemumic acid, 8-quinolinyl ester	10	14.0	I
184----	19114	Chrysanthemumic acid, diester with resorcinol	10 25 50 100 200	28.8 34.4 42.2 45.6 58.0	II II III III III
185----	19122	Chrysanthemumic acid, <u>alpha</u> -terpineol ester	10	14.6	I
186----	19464	Chrysanthemumic acid, tetrahydrofurfuryl ester	10 25 50 100 200	19.6 12.6 26.7 28.8 39.8	I I II II II
187----	19904	Chrysanthemumic acid, ester with 2-thiazoline-2-thiol	10	-18.2	0
188----	19906	Chrysanthemumic acid, diester with 2, 2'-thiodiethanol	10	5.0	I
189----	19469	Chrysanthemumic acid, diester with vanillyl alcohol	10	-2.6	0
190----	19905	Chrysanthemumic acid, monoester with 2, 2'-thiodiethanol	10	8.0	I
191----	19465	Chrysanthemumic acid, ester with thiophenol	10	4.4	I
192----	19161	Chrysanthemumic acid, <u>o</u> -tolyl ester	10	-2.4	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
193----	19162	Chrysanthemumic acid, <u>m</u> -tolyl ester	10	16.4	I
194----	19111	Chrysanthemumic acid, <u>p</u> -tolyl ester	10	10.8	I
195----	19413	Chrysanthemumic acid, 1-(<u>p</u> -tolyl)ethyl ester	10	16.8	I
			25	8.7	I
			50	13.4	I
			100	17.0	I
			200	21.4	II
196----	19116	Chrysanthemumic acid, <u>trans</u> -isoeugenyl ester	10	13.2	I
197----	19164	Chrysanthemumic acid, <u>alpha</u> -1, 1, 1-trichloromethylbenzyl ester	10	8.2	I
198----	19121	Chrysanthemumic acid, 2-(trichloromethyl)-2-propyl ester	10	5.0	I
199----	20888	Chrysanthemumic anhydride	10	2.2	I
200----	658	Cinnamaldehyde, <u>alpha</u> -pentyl-	10	0.3	I
201----	2024	Cinnamic acid, propyl ester	10	28.2	II
			25	3.6	I
			50	7.0	I
			100	27.8	II
			200	52.4	III
202----	20023	Citral-malonic acid condensate	10	-16.2	0
203----	12094	Citral, oxime	10	13.8	I
204----	5823	Citronellal, 7-hydroxy-	10	16.3	I
205----	12093	Citronellal, oxime	10	28.7	II
			25	-14.8	0
			50	14.0	I
			100	6.4	I
			200	33.6	II
206----	753	Coumarin	10	22.0	II
207----	75	<u>m</u> -Cresol, 4-chloro-	10	16.6	I
208----	154	<u>o</u> -Cresol, 4, 6-dinitro-	10	7.9	I
209----	15065	<u>o</u> -Cresol, 4, 6-dinitro-, copper derivative	10	-7.8	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
210----	12132	Crotonanilide, <u>N</u> -ethyl-	10	36.6	II
			25	28.1	II
			50	12.2	I
			100	12.0	I
			200	3.6	I
211----	6047	Crotonic acid, cyclohexyl ester	10	24.4	II
212----	20597	Cyclohexanecarboxamide, <u>N</u> , <u>N</u> -diethyl-1-hydroxy-, acetate	10	-8.0	0
213----	6444	Cyclohexane, 1,2-(<u>p</u> -methoxyphenyl)methylene-dioxy-	10	14.1	I
214----	6456	Cyclohexaneacetamide, <u>N</u> , <u>N</u> -diethyl-1-hydroxy-	10	8.9	I
			25	25.7	II
			50	17.3	I
			100	23.0	II
			200	24.9	II
215----	4999	Cyclohexaneacetic acid, <u>alpha</u> -cyano-, ethyl ester	10	20.4	II
216----	6226	Cyclohexaneacetic acid, 1-hydroxy-, butyl ester	10	4.0	I
217----	6600	Cyclohexaneacetic acid, 1-hydroxy-, cyclopentyl ester	10	3.7	I
218----	6201	Cyclohexaneacetic acid, 1-hydroxy-, ethyl ester	10	3.2	I
219----	6599	Cyclohexaneacetic acid, 1-hydroxy-, isopentyl ester	10	7.3	I
220----	4922	delta ¹ , <u>alpha</u> -Cyclohexaneacetic acid, <u>alpha</u> -cyano-, methyl ester	10	6.6	I
221----	7048	Cyclohexanecarboxylic acid, 3-butynyl ester	10	22.7	II
222----	6302	Cyclohexanecarboxylic acid, 1-hydroxy-	10	-9.7	0
223----	6608	Cyclohexanecarboxylic acid, 1-hydroxy-, acetonyl ester	10	3.1	I
224----	6498	Cyclohexanecarboxylic acid, 1-hydroxy-, 2-butoxyethyl ester	10	3.0	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
225----	6494	Cyclohexanecarboxylic acid, 1-hydroxy-2-ethoxyethyl ester	10	22.8	II
226----	20188	Cyclohexanecarboxylic acid, 1-hydroxy-, 2-propoxyethyl ester	10	-2.1	0
227----	13105	1,2-Cyclohexanedicarboximide, <u>N-sec</u> -butyl-	10	24.0	II
228----	13178	1,2-Cyclohexanedicarboximide, <u>N</u> -butyl-4-methyl-	10	-12.2	0
229----	5567	1,2-Cyclohexanedicarboxylic acid, diethyl ester	10	19.0	I
230----	12000	1,2-Cyclohexanedicarboxylic acid, <u>cis</u> -, diethyl ester	10	33.8	II
			25	23.2	II
			50	12.7	I
			100	12.3	I
			200	1.0	I
231----	14781	1,4-Cyclohexanedicarboxylic acid, diallyl ester	10	30.2	II
			25	23.6	II
			50	15.4	I
			100	45.0	III
			200	64.8	IV
232----	14244	Cyclohexanepropionic acid	10	11.3	I
			25	20.6	II
			50	21.1	II
			100	23.4	II
			200	25.0	II
233----	5558	Cyclohexanol, 1-benzyl-	10	27.9	II
			25	7.8	I
			50	10.2	I
			100	8.5	I
			200	28.3	II
234----	431	Cyclohexanol, 4-(1,1-dimethylpropyl)-	10	3.6	I
235----	5921	Cyclohexanol, 2-(2-ethylhexyloxy)-	10	8.5	I
236----	13205	Cyclohexanol, 1-phenyl-	10	-10.3	0
237----	2133	Cyclohexanol, 2-phenyl-	10	10.2	I
238----	5507	Cyclohexanol, 2- <u>m</u> -tolyl-, <u>trans</u> -	10	15.8	I
239----	5506	Cyclohexanol, 2- <u>p</u> -tolyl-, <u>trans</u> -	10	11.4	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
240----	6534	2-Cyclohexene-1-carboxylic acid, 6-ethyl-2-methyl-4-oxo-, ethyl ester	10	-6.1	0
241----	6515	2-Cyclohexene-1-carboxylic acid, 2-methyl-4-oxo-6-propyl-, ethyl ester	10	-8.4	0
242----	7447	4-Cyclohexene-1,2-dicarboximide, <u>N</u> -allyl-3-methyl-	10 25 50 100 200	22.1 7.7 9.0 1.8 -7.8	II I I I 0
243----	4145	4-Cyclohexene-1,2-dicarboximide, <u>N</u> -butyl-	10	-2.7	0
244----	17928	Cyclohexene-1,2-dicarboximide, <u>N</u> -hexyl-	10	10.1	I
245----	7392	4-Cyclohexene-1,2-dicarboximide, <u>N</u> -propyl-	10	16.9	I
246----	3897	Cyclohexene-1,2-dicarboxylic acid, diethyl ester	10	6.1	I
247----	6560	2-Cyclohexene-1,5-dicarboxylic acid, 2,6-dimethyl-4-oxo-, diethyl ester	10	-13.1	0
248----	7209	4-Cyclohexene-1,2-dicarboximide, <u>N</u> -allyl-	10	19.3	I
249----	16772	Cyclohexylamine, cyclohexyl- <u>N</u> -pentyl-	10	7.7	I
250----	5564	Cyclohexyl ketone	10	-7.0	0
251----	6496	Cyclopentanecarboxylic acid, 1-hydroxy-, tetrahydrofurfuryl ester, acetate	10	-10.1	0
252----	19919	Cyclopentanecarboxylic acid, allethronyl ester	10	-13.2	0
253----	6500	Cyclopentanecarboxylic acid, 1-hydroxy-, 2-butoxyethyl ester	10	-8.3	0
254----	6138	Cyclopentanecarboxylic acid, 1-hydroxy-, cyclohexyl ester	10	-1.1	0
255----	12144	2,4-Decanediol	10	-25.5	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
256----	4453	Decanoic acid	10	28.2	II
			25	21.0	II
			50	26.1	II
			100	35.9	II
			200	35.1	II
257----	8315	Decanoic acid, diester with diethylene glycol	10	-6.7	0
258----	7159	5-Decyne-4, 7-diol, 2, 4, 7, 9-tetramethyl-	10	-15.4	0
259----	1464	Dehydroacetic acid	10	32.0	II
			25	-1.4	0
			50	-12.8	0
			100	6.2	I
			200	10.0	I
260----	17596	4a-Dibenzofurancarboxaldehyde, 1, 4, 4a, 5a, 6, 9, 9a, 9b-octahydro-	10	-7.2	0
261----	18013	4a-Dibenzofuranmethanol, 1, 4, 4a, 5a, 6, 9, 9a, 9b-octahydro-	10	13.5	I
262----	16572	Diheptylamine	10	1.2	I
263----	7061	<u>m</u> -Dioxane, 5-butyl-5-ethyl-2-(1-propenyl)-	10	-8.7	0
264----	7317	<u>m</u> -Dioxane, 5-ethyl-2-isopropyl-5-nitro-	10	13.4	I
265----	7082	<u>m</u> -Dioxane, 5-ethyl-5-nitro-2-(1-propenyl)-	10	13.2	I
266----	7090	<u>m</u> -Dioxane, 5-ethyl-5-nitro-2-propyl-	10	-7.2	0
267----	13107	<u>m</u> -Dioxane, 2-(2-furyl)-	10	4.9	I
268----	7081	<u>m</u> -Dioxane, 5-methyl-5-nitro-2-(1-propenyl)-	10	7.8	I
269----	5722	<u>m</u> -Dioxane, 4, 4, 6-trimethyl-2-phenyl-	10	14.3	I
270----	5079	5- <u>m</u> -Dioxanol, 2-(1-ethylpentyl)-	10	20.9	II
			25	-0.9	0
			50	-4.9	0
			100	-21.0	0
			200	-20.6	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
271----	5103	5- <u>m</u> -Dioxanol, 2-(1-ethyl-propyl)- and 1,3-Dioxolane-4-methanol, 2-(1-ethylpropyl)-	10	24.9	II
			25	-17.0	0
			50	-15.0	0
			100	-27.4	0
			200	-1.6	0
272----	6440	1,3-Dioxolane-2-acetic acid, 2-methyl-, cyclohexyl ester	10	21.5	II
			25	14.3	I
			50	8.1	I
			100	17.6	I
			200	2.4	I
273----	8339	1,3-Dioxolane-4-methanol, 2-isobutyl-2-methyl-	10	46.5	III
			25	14.5	I
			50	16.3	I
			100	15.0	I
			200	19.2	I
274----	7430	1,3-Dioxolane-4-methanol, 2-methyl-2-phenyl	10	-5.0	0
275----	6381	1,3-Dioxolane-2-propionic acid, 2-methyl-, cyclohexyl ester	10	8.0	I
276----	14850	Dipropylenetriamine	10	-14.8	0
277----	8296	Ethanol, 2-(<u>o</u> -allylphenoxy)-	10	15.1	I
278----	7923	Ethanol, 2-(benzyloxy)-, acetate	10	-8.2	0
279----	1040	Ethanol, 2-(benzyloxy)-	10	33.6	II
			25	6.5	I
			50	-5.1	0
			100	-4.3	0
			200	14.9	I
280----	2812	Ethanol, 2-(<u>p</u> - <u>sec</u> -butylphenoxy)-	10	2.6	I
281----	33	Ethanol, 2-(<u>p</u> - <u>tert</u> -butylphenoxy)-	10	8.4	I
282----	5014	Ethanol, 2-carvacryloxy-	10	18.3	I
283----	3886	Ethanol, 2-(<u>o</u> -chlorophenoxy)-	10	2.6	I
284----	373	Ethanol, 2-(2-cyclohexyloxyethoxy)-	10	-13.7	0
285----	3393	Ethanol, 2-(dicyclohexylamino)-	10	-3.0	0
286----	2220	Ethanol, 2-(diethylphenoxy)-	10	-9.4	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
287----	3882	Ethanol, 2-(diethylphenyl)-	10	12.4	I
288----	1463	Ethanol, 2-(<u>N</u> -ethylanilino)-	10	39.7	II
			25	23.8	II
			50	-15.2	0
			100	-3.3	0
			200	16.3	I
289----	300	Ethanol, 2-[2-(2-ethylhexyloxy)ethoxy]	10	18.9	1
290----	2495	Ethanol, 2-(<u>p</u> -ethylphenoxy)-	10	25.2	II
			25	7.9	I
			50	-16.1	0
			100	6.2	1
			200	9.7	I
291----	301	Ethanol, 2-(2-hexyloxyethoxy)-	10	14.1	1
292----	164	Ethanol, 2-(<u>alpha</u> -methylbenzyloxy)-	10	-15.4	0
293----	165	Ethanol, 2-(<u>alpha</u> -methylbenzyloxy)-, acetate	10	-18.3	0
294----	4636	Ethanol, 2-(<u>p</u> -menthylthio)-	10	12.1	I
295----	774	Ethanol, 2-[2-(3-methyl-2-norcamphanyl-methoxy)ethoxy]-	10	15.3	1
296----	19562	Ethanol, pentachlorophenoxy-	10	-3.0	0
297----	752	Ethanol, 2-phenoxy-	10	38.7	II
			25	-11.1	0
			50	-13.1	0
			100	0.5	1
			200	4.8	I
298----	2145	Ethanol, 2-phenoxy-, acetate	10	0	0
299----	4321	Ethanol, 2-(2-phenoxyethoxy)-	10	6.0	I
300----	2633	Ethanol, 2-(2-phenylcyclohexyloxy)-	10	9.0	1
301----	17423	Ethanol, 2-(phenylthio)-	10	-7.0	0
302----	5542	Ethanol, 2, 2'-thiodi-, diacetate	10	2.6	1

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
303----	2219	Ethanol, 2-tolyloxy-	10	9.2	I
304----	8295	Ethanol, 2-(2,5-xilyloxy)-	10	12.8	I
305----	16587	Ether, p-bromophenyl 2,4-dinitrophenyl	10	4.0	I
306----	2513	Ether, p- <u>tert</u> -butylphenyl vinyl	10	17.7	I
307----	16529	Ether, o-cyclohexylphenyl 2,4-dinitrophenyl	10	3.1	I
308----	16589	Ether, 2,4-dinitrophenyl <u>m</u> -nitrophenyl	10	-0.1	0
309----	16480	Ether, 2,4-dinitrophenyl phenyl	10 25 50 100 200	31.2 63.6 69.1 73.2 68.7	II IV IV IV IV
310----	16481	Ether, 2,4-dinitrophenyl <u>o</u> -tolyl	10 25 50 100 200	46.0 32.6 26.0 21.9 29.6	III II II II II
311----	17910	Ethylenediamine, <u>N</u> - <u>N'</u> -bis(2-ethylhexyl)-	10	9.1	I
312----	6584	Ethylene glycol, monobenzoate	10 25 50 100 200	40.5 7.0 -3.0 11.3 16.4	III I 0 I I
313----	14249	Fencholic acid	10	14.2	I
314----	16747	Formamide, <u>N</u> -cyclohexyl- <u>N</u> -pentyl-	10	2.9	I
315----	5979	2-Furamide, <u>N</u> , <u>N</u> -diethyl-	10	6.2	I
316----	5863	2-Furanacrylic acid, 2-ethoxyethyl ester	10	14.2	I
317----	5862	2-Furanacrylic acid, isopentyl ester	10	17.3	I
318----	5540	2-Furanacrylic acid, 2-methoxyethyl ester	10	7.5	I
319----	5866	2-Furanacrylic acid, 2-methylallyl ester	10	16.5	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
320----	5536	2-Furanacrylic acid, pentyl ester	10	12.3	I
321----	6358	Glutaramic acid, <u>N,N</u> -diisopropyl-, ethyl ester	10	16.9	I
322----	6397	Glutaramic acid, <u>N,N</u> -diisopropyl-, propyl ester	10	22.7	II
			25	3.2	I
			50	28.0	II
			100	64.4	IV
323----	6594	Glutaramic acid, 2-hydroxy-2-methyl- <u>N,N</u> -dipropyl-, <u>gamma</u> -lactone	10	2.2	I
324----	6024	Glutaric acid, diisobutyl ester	10	13.4	I
325----	6025	Glutaric acid, 3-oxo-, dipropyl ester	10	10.9	I
326----	7407	Glycidic acid, 3-phenyl-, allyl ester	10	-6.7	0
327----	6537	Glycine, <u>N</u> -methyl- <u>N</u> -phenyl-, ethyl ester	10	-2.6	0
328----	14254	Glycolamide, <u>N</u> -pentyl-, benzoate	10	-7.6	0
329----	13125	1,6-Heptadien-4-ol, 4-(1-ethylpentyl)-	10	-13.3	0
330----	12194	2,4-Heptanediol	10	16.8	I
331----	12142	2,4-Heptanediol, 5-ethyl-	10	16.3	I
332----	12169	3,5-Heptanediol, 2-methyl-	10	15.2	I
333----	5982	3,5-Heptanediol, 2,4,4-trimethyl-	10	17.8	I
334----	6628	Heptanoic acid, 2-hydroxypropyl ester	10	3.0	I
335----	15141	Heptylamine, <u>N</u> -(1-methylhexyl)-	10	4.4	I
336----	13179	4-Heptyne-3,6-diol, 3-isopropyl-2,6-dimethyl-	10	11.8	I
337----	5876	Hexanal, <u>2</u> -(2-cyanoethyl)- <u>2</u> -ethyl	10	28.1	II
			25	0.6	I
			50	-6.3	0
			100	-6.4	0
			200	28.8	II

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
338----	3888	Hexanedioic acid, <u>beta</u> -methyl-, diethyl ester	10	3.3	I
339----	13210	1,2-Hexanediol	10	-2.3	0
340----	6380	1,6-Hexanediol, diformate	10	17.9	I
341----	375	1,3-Hexanediol, 2-ethyl-	10 25 50 100 200	20.1 3.0 2.2 2.8 7.6	II I I I I
342----	5838	2,4-Hexanediol, 5-methyl-	10	21.5	II
343----	13044	Hexanoic acid, <u>2</u> -cyano- <u>3</u> , <u>3</u> -dimethyl- <u>4</u> -oxo-, allyl ester	10	-11.0	0
344----	1371	Hexanoic acid, <u>2</u> -ethyl	10 25 50 100 200	20.5 7.4 9.6 -3.6 2.4	II I I 0 I
345----	6102	Hexanoic acid, ethylene diester	10	3.3	I
346----	13204	Hexanoic acid, 2-(2-hydroxyethoxy)ethyl ester	10	-0.2	0
347----	6351	Hexanoic acid, 5-hydroxypentyl ester	10	-1.3	0
348----	8649	1-Hexanol, 3,5-diethoxy-	10 25 50 100	33.9 21.0 20.8 34.0	II II II II
349----	20640	3-Hexanol, 3-methyl-6-phenyl-	10	8.5	I
350----	7483	4-Hexenenitrile, 4-acetyl-5-methyl-	10	6.0	I
351----	13117	4-Hexenoic acid, 2,3-epoxy-3,5-dimethyl-, ethyl ester	10	-18.3	0
352----	15113	Hexylamine, <u>N</u> -(2-butoxyethyl)-2-ethyl-	10 25 50 100 200	22.5 -10.8 -14.6 16.2 37.0	II 0 0 I II

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
353----	6219	Hydracrylic acid, 3-phenyl-, butyl ester	10	-0.6	0
354----	6216	Hydracrylic acid, 3-phenyl-, ethyl ester	10	1.1	I
355----	6217	Hydracrylic acid, 3-phenyl-, isopropyl ester	10	9.9	I
356----	6220	Hydracrylic acid, 3-phenyl-, methyl ester	10	11.1	I
357----	6218	Hydracrylic acid, 3-phenyl-, propyl ester	10	10.4	I
358----	7121	Hydrocinnamic acid, <u>alpha</u> , <u>beta</u> -epoxy- <u>beta</u> -methyl-, allyl ester	10	3.0	I
359----	7198	Hydrocinnamic acid, <u>alpha</u> , <u>beta</u> -epoxy- <u>beta</u> -methyl-, 2-ethoxyethyl ester	10	-5.1	0
360----	7153	Hydrocinnamic acid, <u>alpha</u> , <u>beta</u> -epoxy- <u>beta</u> -methyl-, methyl ester	10	12.4	I
361----	11190	Hydrocinnamic acid, <u>beta</u> -hydroxy- <u>alpha</u> -methyl-, ethyl ester	10 25 50 100 200	14.6 26.9 27.2 29.6 46.2	I II II II III
362----	17916	Imidazoline, 1,3-bis(2-ethylhexyl)-2-(1-ethylpentyl)-	10	-13.0	0
363----	17907	Imidazoline, cyclopentenyl-2-pentyl-	10	0.4	I
364----	5047	2-Imidazoline, 2-undecyl-5-methyl-	10	4.9	I
365----	14591	1,3-Indandione, 2-heptanoyl-	10	-12.5	0
366----	366	1,3-Indandione, 2-isovaleryl-	10	16.4	I
367----	2711	Isobutyric acid, 2-phenoxyethyl ester	10	18.2	I
368----	3944	Ketone, butyl furfuryl	10	1.6	I
369----	18281	Lactanilide, <u>N</u> -2-hydroxy-ethyl-	10	7.6	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
370----	3163	Lactic acid, 2-butoxyethyl ester	10	14.2	I
371----	8756	Lactic acid, p-chlorophenyl ester, acetate	10	2.6	I
372----	15676	Lactic acid, diester with 1,3-propanediol, diacetate	10	-7.7	0
373----	3867	Lactic acid, 2-(2-ethyl-hexyloxy)ethyl ester	10	10.7	I
374----	4298	Lactic acid, 2-methyl-, phenylpropyl ester	10 25 50 100 200	23.8 -2.3 7.2 11.2 24.7	II 0 I I II
375----	3167	Lactic acid, 2-phenoxyethyl ester	10	16.4	I
376----	2538	Lactic acid, phenyl ester, acetate	10 25 50 100 200	28.8 2.8 -17.6 -12.4 16.8	II I 0 0 I
377----	8757	Lactic acid, tetrahydrofurfuryl ester, ethyl carbonate	10	-21.0	0
378----	2459	Lauraldehyde	10	-6.1	0
379----	112	Lauric acid	10	5.5	I
380----	970	Lauric acid, sorbitol ester	10	12.7	I
381----	11124	Laurin, tri-	10 25 50 100 200	21.5 35.5 39.6 48.6 46.6	II II II III III
382----	2320	Levulinic acid, benzyl ester	10	16.4	I
383----	644	Maleic acid, dibutyl ester	10	1.7	I
384----	1186	Maleimide, N-phenyl-	10	11.9	I
385----	6575	Malic acid, dl-, diisopropyl ester	10	2.0	I
386----	20241	Mandelic acid, allyl ester	10	15.2	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
387----	1789	Mandelic acid, butyl ester	10	31.6	II
			25	7.9	I
			50	14.4	I
			100	8.8	I
			200	17.6	I
388----	1643	Mandelic acid, ethyl ester	10	5.1	I
389----	4203	Mandelic acid, isobutyl ester	10	-1.5	0
390----	20351	Mandelic acid, isopentyl ester	10	12.0	I
391----	20127	Mandelic acid, pentyl ester	10	14.1	I
			12.5	8.4	I
			25	16.0	I
			50	34.2	II
			100	32.6	II
392----	20224	Mandelic acid, propyl ester	10	8.7	I
393----	4703	Morpholine, 4-benzyI-	10	4.2	I
394----	4262	4-Morpholineacetic acid, isobornyl ester	10	15.7	I
395----	19564	Naph[2, 3-c]acridine-5, 8, 14-(13)-trione, 11-chloromethyl-10-methyl-, 1, 1, 3-trimethyl-isothiuronium salt	10	-25.7	0
396----	6188	1(2H)-Naphthalenone, octahydro-	10	17.4	I
397----	106	1-Naphthol	10	14.1	I
398----	7039	1-Naphthol, 1, 2, 3, 4-tetrahydro-	10	-0.2	0
399----	81	2-Naphthol	10	0.9	I
400----	15303	2-Naphthol, bromo-	10	0	0
401----	5918	2-Naphthol, decahydro-	10	36.3	II
			25	25.3	II
			50	21.0	II
			100	31.1	II
			200	40.4	III
402----	5985	2-Naphthol, 1-ethyl-1, 2, 3, 4-tetrahydro-	10	36.2	II
			25	29.8	II
			50	31.0	II
			100	45.8	III
			200	53.8	III

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
403----	5563	2-Naphthol, 1, 2, 3, 4-tetra-hydro-	10	26.6	II
			25	20.5	II
			50	12.2	I
			100	24.1	II
			200	34.8	II
404----	5847	2-Naphthol, 1, 2, 3, 4-tetra-hydro-1-methyl-	10	31.7	II
			25	10.0	I
			50	8.7	I
			100	18.1	I
			200	27.2	II
405----	85	1-Naphthylamine	10	3.5	I
406----	20397	1-Naphthylamine, <u>N</u> -allyl-	10	12.1	I
407----	6207	Nitritotricarboxylic acid, triethyl ester	10	-0.8	0
408----	12147	1, 3-Nonanediol, 2, 2-dimethyl-	10	-6.6	0
409----	5949	2, 4-Nonanediol	10	4.5	I
410----	4164	Nonanoic acid	10	43.5	III
			25	23.1	II
			50	20.1	II
			100	29.3	II
			200	33.4	II
411----	2457	Nonanoic acid, hydroxy-, lactone	10	17.9	I
412----	13058	1, 2-Octanediol	10	-6.9	0
413----	13039	2, 3-Octanediol	10	0.8	I
414----	12012	3, 5-Octanediol, 4-methyl-	10	32.8	II
			25	20.0	I
			50	7.7	I
			100	-9.0	0
415----	7224	Octanoic acid, 2-cyano-4-ethyl-, methyl ester	10	2.7	I
416----	8118	Octanoic acid, tetrahydro-furfuryl ester	10	0.3	I
417----	6135	Octanoic anhydride	10	29.9	II
			25	40.4	III
			50	49.4	III
			100	42.8	III
			200	50.2	III
418----	12153	3-Octanone, 6-ethyl-5-hydroxy-	10	9.0	I

Item No.	ENT -No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
419----	15126	Octylamine, <u>N</u> -pentyl-	10	27.6	II
			25	21.6	II
			50	10.6	I
			100	25.0	II
			200	26.0	II
420----	7241	1-Oxaspiro[2.5]octane-2-carboxylic acid, 2,6-dimethyl-, methyl ester	10	8.3	I
421----	2706	1,3-Pentanediol, 2,2,4-trimethyl-	10	16.3	I
422----	19541	2,4-Pentanedione, 3-benzylidene-	10	3.2	I
423----	15127	Pentylamine, <u>N</u> -2-(2-butoxyethoxy)-	10	-6.0	0
424----	5672	Phenethyl alcohol, <u>p</u> -chloro- <u>alpha</u> -isopropyl-	10	17.6	I
425----	3880	Phenethyl alcohol, dichloro-	10	19.3	I
426----	1774	Phenethyl alcohol, <u>p</u> -isopropyl-	10	11.1	I
427----	12043	Phenethyl alcohol, <u>alpha</u> -isopropyl-2,4-dimethyl-	10	26.0	II
			25	6.6	I
			50	24.4	II
			100	11.0	I
			200	21.2	II
428----	5522	Phenethyl alcohol, <u>p</u> -methoxy-	10	18.8	I
429----	7014	Phenethyl alcohol, <u>o</u> -methyl-	10	29.8	II
430----	707	Phenetole, 2,4-dinitro-	10	44.8	III
			25	34.6	II
			50	44.6	III
			100	38.4	II
			200	39.2	II
431----	17109	Phenol, 2-allyl-4-methoxy-	10	15.3	I
			12.5	12.8	I
			25	25.6	II
			50	15.2	I
			100	27.3	II
432----	14903	Phenol, <u>p</u> -bromo-	10	12.0	I
433----	145	Phenol, 2-bromo-4-phenyl-	10	5.1	I
434----	19942	Phenol, <u>p</u> -isopropoxy-	10	1.3	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
435----	841	Phenol, <u>p</u> -methoxy-	10	8.9	I
436----	134	Phenol, pentachloro-	10	7.3	I
437----	3451	Phenol, phenethyl-	10	15.7	I
438----	1682	Phenol, tetrachloro-	10	0.4	I
439----	73	Phenol, 2, 3, 4, 6-tetrachloro-	10	10.4	I
440----	22331	Phenol, 2, 3, 5, 6-tetra- chloro-	10 25 50 100 200	23.5 11.4 26.2 49.0 72.3	II I II III IV
441----	14896	Phenol, tribromo-	10	-3.1	0
442----	399	Phosphoric acid, tributyl ester	10	10.0	I
443----	19763	Phosphonic acid, 2, 2, 2- trichloro-1-hydroxyethyl-, dimethyl ester	10 12.5 25 50 100	-2.4 8.0 23.9 22.6 22.0	0 I II II II
444----	329	Phthalic acid, diethyl ester	10	9.7	I
445----	1766	Phthalic acid, diisopropyl ester	10 25 50 100 200	31.2 -5.5 -14.3 -30.8 -8.6	II 0 0 0 0
446----	262	Phthalic acid, dimethyl ester	10 25 50 100 200	29.8 5.6 22.0 14.6 22.0	II I II I II
447----	1473	Phthalic acid, dimethyl ester 60%	10	18.9	I
448----	5785	Phthalide	10	25.4	II
449----	19530	Phthalide, 3-pentyloxy-	10	7.9	I
450----	2417	Phthalimide, <u>N</u> -pentyl-	10 25 50 100 200	24.0 15.8 53.6 76.6 91.6	II I III IV V

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
451----	558	Pinene, ether with ethylene glycol	10	9.8	I
452----	6544	1-Piperidineacetic acid, cyclohexyl ester	10 25 50 100 200	39.5 29.3 46.0 62.8 66.1	II II III IV IV
453----	147	Piperonal	10	-12.4	0
454----	20293	Piperonyl alcohol, <u>alpha</u> - <u>tert</u> -butyl-	10	8.0	I
455----	7243	Pivalophenone, <u>beta</u> -hydroxy-	10	-3.3	0
456----	13111	Propane, 1-(<u>p</u> -chlorophenoxy)-2,3-epoxy-	10	15.0	I
457----	19567	Propane, 1,3-dimethoxy-1,3-diphenyl-	10	-17.3	0
458----	16571	1,3-Propanediamine, <u>N</u> , <u>N</u> -dipentyl-	10	5.1	I
459----	8286	Propanediol, butoxy-, polymer	12.5 25 50 100 250	26.4 33.2 41.2 23.6 41.4	II II III II III
460----	1442	Propanediol, <u>x</u> -(2-ethylbutoxy)-	10	15.0	I
461----	4562	1,2-Propanediol, 3-(1,3-dimethylbutoxy)-	10	-5.0	0
462----	6378	1,3-Propanediol, monobenzoate	10	5.0	I
463----	11319	1-Propanol, 3-benzyloxy-	10	-13.6	0
464----	20626	1-Propanol, 3-(<u>p</u> -chlorophenyl)-	10	-4.9	0
465----	341	2-Propanol, 3-[2-(2-ethylhexyloxy)-1-methylethoxy]-	10	7.6	I
466----	1123	2-Propanol, 1-[2-(3,3,5-trimethylcyclohexyloxy)propoxy]-	10	5.9	I
467----	16748	Propionamide, <u>N</u> -cyclohexyl- <u>N</u> -pentyl-	10	-13.9	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
468----	5815	Propionanilide, <u>N</u> -methyl-	10	12.3	I
469----	5802	Propionanilide, <u>N</u> -pentyl-	10	1.3	I
470----	2446	Propionic acid, cinnamyl ester	10	30.0	III
			25	0.4	I
			50	17.5	I
			100	35.2	II
			200	39.9	II
471----	6254	Propionic acid, 3-hydroxy-cyclohexyl ester	10	12.4	I
472----	6113	Propionic acid, <u>p</u> -methoxybenzyl ester	10	18.7	I
473----	7435	Propionic acid, 2-chloro-, tetrahydrofurfuryl ester	10	1.5	I
474----	7470	Propionic acid, 2-cyano-, 2-methylcyclohexyl ester	10	13.9	I
475----	14471	Propionic acid, 3-ethoxy-, 2-(2-chloroethoxy)ethyl ester	10	-15.9	0
476----	8771	Propionic acid, 3-(2-ethoxyethoxy)-, 2-ethoxyethyl ester	10	-23.8	0
477----	15746	Propionic acid, 3-hexyloxy-, methyl ester	10	-13.5	0
478----	3241	Propionic acid, 3-methoxy-, 3-chloropropyl ester	10	0.5	I
479----	12051	<u>m</u> -Propionotoluidide, <u>N</u> -ethyl-	10	26.8	II
			25	-1.8	0
			50	-18.8	0
			100	9.8	I
			200	32.0	II
480----	12042	<u>p</u> -Propionotoluidide, <u>N</u> -ethyl-	10	20.0	I
			25	8.4	I
			50	5.0	I
			100	3.2	I
			200	16.8	I
481----	10511	Propiophenone, oxime	10	6.4	I
482----	910	<u>2H</u> -Pyran-6-carboxylic acid, 3,4-dihydro-2,2-dimethyl-4-oxo-, ethyl ester	10	9.9	I
483----	19229	Pyridine, 4-benzyl-	10	3.7	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
484----	19566	Pyridine, 2,6-diformamido-	10	-23.3	0
485----	16383	Pyrimidine, 5-amino-5-ethylhexahydro-1,3-dihexyl-	10	35.4	II
			25	21.8	II
			50	26.6	II
			100	34.3	II
			200	45.4	III
486----	16382	Pyrimidine, 5-amino hexahydro-1,3-dihexyl-5-methyl-	10	28.5	II
			25	28.8	II
			50	30.0	II
			100	24.8	II
			200	57.0	III
487----	3602	Pyrocatechol, diacetate	10	11.8	I
488----	19414	Pyrrolidine, 1-chrysanthemumoyl-	10	4.8	I
489----	5971	Quinoline, 1-acetyl-1,2,3,4-tetrahydro-	10	13.3	I
490----	5974	Quinoline, 1-butyryl-1,2,3,4-tetrahydro-	10	21.1	II
			25	13.3	I
			50	10.8	I
			100	24.5	II
			200	48.5	III
491----	16316	Quinoline, 6-methoxy-	10	-1.7	0
492----	3873	Resorcinol, 4-chloro-	10	2.5	I
493----	6314	Resorcinol, diacetate	10	19.8	I
494----	2407	Salicylic acid	10	13.5	I
495----	16484	Santomerse DT emulsifier	10	-11.5	0
496----	15510	Senecioic acid, 2-[2-(2-butoxyethoxy)ethoxy]ethyl ester	10	17.9	I
497----	15904	Silane, diaminobis(<u>tert</u> -butoxy)-	10	11.9	I
498----	12166	Spiro[cyclohexane-1,3'-indan]-1'-one, 4,5,6,7 (or 7a)-tetrahydro-	10	18.7	I
			25	26.7	II
			50	36.6	II
			100	26.0	II
			200	35.3	II
499----	16827	Styrene, <u>beta</u> -nitro-	10	-4.3	0

Item No.	ENT-No.	Chemical name	Deposit (mg./sq. ft.)	Repellency	
				Percent	Class
500----	6021	Suberic acid, diethyl ester	12.5	33.6	II
			25	43.9	III
			50	44.2	III
			100	47.2	III
501----	6166	Succinamic acid, <u>N</u> , <u>N</u> -diethyl-, ethyl ester	10	-3.4	0
502----	6275	Succinamic acid, <u>N</u> , <u>N</u> -diethyl-isobutyl ester	10	18.2	I
503----	6402	Succinamic acid, <u>N</u> , <u>N</u> -diisobutyl-, methyl ester	10	-5.3	0
504----	6390	Succinamic acid, <u>N</u> , <u>N</u> -diisopropyl-, <u>sec</u> -butyl ester	10	34.4	II
			25	22.0	II
			50	31.2	II
			100	57.2	III
			200	57.6	III
505----	6405	Succinamic acid, <u>N</u> , <u>N</u> -diisopropyl-, ethyl ester	10	-2.2	0
506----	6350	Succinamic acid, <u>N</u> , <u>N</u> -diisopropyl-, isopropyl ester	10	15.1	I
507----	6396	Succinamic acid, <u>N</u> , <u>N</u> -diisopropyl-, methyl ester	10	16.0	I
			25	21.0	II
			50	25.3	II
			100	4.0	I
			200	23.0	II
508----	6348	Succinamic acid, <u>N</u> , <u>N</u> -diisopropyl-, propyl ester	10	17.6	I
509----	6621	Succinamic acid, <u>N</u> , <u>N</u> -dimethyl-, propyl ester	10	1.9	I
510----	6619	Succinamic acid, <u>N</u> , <u>N</u> -dipropyl-, allyl ester	10	13.2	I
511----	6393	Succinamic acid, <u>N</u> , <u>N</u> -dipropyl-, <u>sec</u> -butyl ester	10	34.0	II
			25	18.7	I
			50	4.7	I
			100	16.0	I
			200	33.6	II
512----	6269	Succinamic acid, <u>N</u> , <u>N</u> -dipropyl-, isopropyl ester	10	9.2	I
513----	11155	Succinic acid, cyano-, dimethyl ester	10	17.2	I

Item No.	ENT-No.	Chemical name	Deposit (mg./sq.ft.)	Repellency	
				Percent	Class
514----	5611	Succinic acid, 2-cyano-3-methyl-, diethyl ester	10	-9.6	0
515----	2971	Succinimide, <u>N</u> -pentyl-	10	11.8	I
516----	14589	Sulfide, bis(2-pyridylethyl)	10	-19.4	0
517----	11606	Tartronic acid, pinacolonyl-, diethyl ester	10	-4.7	0
518----	120	Thymol, chloro-	10	14.9	I
519----	20218	<u>m</u> -Toluamide, <u>N,N</u> -diethyl-	10	1.4	I
520----	20217	<u>o</u> -Toluamide, <u>N,N</u> -diethyl-	10	9.2	I
521----	20219	<u>p</u> -Toluamide, <u>N,N</u> -diethyl-	10	-1.2	0
522----	485	Toluene, 2-chloro-6-nitro-	10	18.5	I
523----	19565	<u>o</u> -Toluenesulfonic acid, 5-chloro- <u>alpha</u> , <u>alpha</u> -bis-(3,5-dichloro-2-ethoxyphenyl)-, sodium salt	10	-11.0	0
524----	4861	Tonkene P (chemical name unknown)	10	24.8	II
525----	751	Undecanoic acid, hydroxy-, lactone	10 25 50 100 200	29.9 24.5 7.4 15.3 49.7	II II I I III
526----	16567	Undecylamine	10 25 50 100 200	46.8 38.3 45.1 43.2 21.0	III II III III II
527----	17993	Valeric acid, 2-oxo-, oxime, ethyl ester	10	2.1	I
528----	10517	Valerophenone, 4'-methoxy-	10	-23.5	0
529----	93	Vanillin	10	27.3	II
530----	141	<u>o</u> -Veratraldehyde	10 25 50 100 200	22.9 24.4 36.0 22.8 34.8	II II II II II
531----	3125	Wood tar distillate, soluble	10	16.5	I
532----	1301	Xanthic acid, ethyl-, ethyl ester	10	9.0	I
533----	18189	3,5-Xylenol, 4-bromo-	10	5.2	I
534----	8632	3,5-Xylenol, 4-chloro-	10	-13.1	0

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ENT-No.	Item No.	ENT-No.	Item No.	ENT-No.	Item No.
33----	281	1464----	259	4096----	103
73----	439	1473----	447	4132----	84
75----	207	1643----	388	4145----	243
81----	399	1682----	438	4164----	410
85----	405	1766----	445	4203----	389
93----	529	1774----	426	4262----	394
106----	397	1789----	387	4298----	374
112----	379	2002----	22	4321----	299
120----	518	2024----	201	4453----	256
134----	436	2069----	56	4562----	461
141----	530	2133----	237	4634----	83
145----	433	2145----	298	4636----	294
147----	453	2219----	303	4703----	393
154----	208	2220----	286	4861----	524
164----	292	2320----	382	4922----	220
165----	293	2377----	51	4999----	215
189----	50	2407----	494	5014----	282
227----	29	2417----	450	5047----	364
229----	48	2446----	470	5079----	270
262----	446	2457----	411	5103----	271
300----	289	2459----	378	5506----	239
301----	291	2484----	11	5507----	238
329----	444	2495----	290	5508----	9
341----	465	2513----	306	5514----	104
342----	38	2538----	376	5519----	81
366----	366	2633----	300	5522----	428
373----	284	2706----	421	5523----	12
375----	341	2711----	367	5524----	13
399----	442	2812----	280	5536----	320
431----	234	2913----	66	5540----	318
479----	28	2971----	515	5542----	302
485----	522	3125----	531	5558----	233
488----	72	3163----	370	5563----	403
558----	451	3167----	375	5564----	250
644----	383	3193----	34	5567----	229
658----	200	3200----	32	5611----	514
707----	430	3241----	478	5672----	424
751----	525	3369----	91	5712----	58
752----	297	3393----	285	5713----	80
753----	206	3439----	108	5722----	269
774----	295	3444----	54	5756----	75
841----	435	3451----	437	5785----	448
845----	65	3464----	42	5796----	92
910----	482	3602----	487	5802----	469
925----	4	3710----	68	5815----	468
970----	380	3867----	373	5823----	204
1022----	52	3873----	492	5831----	19
1040----	279	3880----	425	5838----	342
1123----	466	3882----	287	5844----	79
1186----	384	3886----	283	5847----	404
1301----	532	3888----	338	5862----	317
1371----	344	3897----	246	5863----	316
1442----	460	3916----	85	5866----	319
1456----	99	3944----	368	5869----	78
1463----	288	3995----	109	5876----	337

ENT-No.	Item No.	ENT-No.	Item No.	ENT-No.	Item No.
5883----	76	6444----	213	7483----	350
5903----	88	6456----	214	7706----	3
5913----	53	6484----	40	7790----	26
5918----	401	6487----	39	7923----	278
5921----	235	6494----	225	8118----	416
5926----	90	6496----	251	8286----	459
5949----	409	6498----	224	8295----	304
5971----	489	6500----	253	8296----	277
5974----	490	6503----	82	8315----	257
5979----	315	6515----	241	8322----	37
5982----	333	6534----	240	8339----	273
5985----	402	6537----	327	8490----	69
6021----	500	6544----	452	8606----	2
6024----	324	6555----	23	8632----	534
6025----	325	6560----	247	8649----	348
6047----	211	6565----	25	8756----	371
6080----	55	6569----	24	8757----	377
6102----	345	6575----	385	8771----	476
6107----	47	6584----	312	8991----	86
6113----	472	6594----	323	10028----	44
6135----	417	6599----	219	10511----	481
6138----	254	6600----	217	10517----	528
6166----	501	6605----	8	10548----	33
6188----	396	6608----	223	10577----	94
6201----	218	6619----	510	11124----	381
6207----	407	6621----	509	11155----	513
6216----	354	6628----	334	11190----	361
6217----	355	7014----	429	11319----	463
6218----	357	7039----	398	11606----	517
6219----	353	7043----	70	12000----	230
6220----	356	7048----	221	12012----	414
6221----	101	7061----	263	12036----	93
6222----	102	7081----	268	12037----	30
6226----	216	7082----	265	12041----	31
6231----	27	7087----	96	12042----	480
6238----	20	7090----	266	12043----	427
6254----	471	7121----	358	12051----	479
6269----	512	7153----	360	12093----	205
6275----	502	7159----	258	12094----	203
6295----	21	7178----	15	12132----	210
6302----	222	7187----	16	12142----	331
6314----	493	7198----	359	12144----	255
6315----	98	7209----	248	12147----	408
6348----	508	7224----	415	12153----	418
6350----	506	7241----	420	12166----	498
6351----	347	7243----	455	12169----	332
6358----	321	7274----	107	12194----	330
6378----	462	7317----	264	13039----	413
6380----	340	7370----	17	13042----	74
6381----	275	7371----	18	13044----	343
6390----	504	7392----	245	13047----	100
6393----	511	7407----	326	13058----	412
6396----	507	7430----	274	13105----	227
6397----	322	7435----	473	13107----	267
6402----	503	7447----	242	13111----	456
6405----	505	7451----	95	13117----	351
6440----	272	7470----	474	13125----	329

ENT-No.	Item No.	ENT-No.	Item No.	ENT-No.	Item No.
13178----	228	17907----	363	19406----	162
13179----	336	17910----	311	19407----	148
13204----	346	17916----	362	19408----	159
13205----	236	17928----	244	19409----	152
13210----	339	17993----	527	19410----	161
14147----	61	18013----	261	19411----	176
14244----	232	18189----	533	19412----	183
14249----	313	18281----	369	19413----	195
14254----	328	18402----	97	19414----	488
14471----	475	19001----	154	19415----	131
14589----	516	19002----	165	19416----	130
14591----	365	19003----	153	19420----	156
14640----	43	19004----	134	19463----	170
14781----	231	19005----	166	19464----	186
14806----	7	19006----	135	19465----	191
14850----	276	19007----	179	19466----	175
14896----	441	19089----	64	19467----	181
14903----	432	19111----	194	19468----	164
15018----	87	19113----	168	19469----	189
15065----	209	19114----	184	19514----	5
15077----	105	19116----	196	19530----	449
15113----	352	19117----	163	19541----	422
15126----	419	19118----	158	19558----	172
15127----	423	19119----	182	19559----	149
15141----	335	19120----	171	19562----	296
15235----	10	19121----	198	19563----	73
15303----	400	19122----	185	19564----	395
15487----	67	19123----	139	19565----	523
15510----	496	19124----	173	19566----	484
15531----	71	19125----	174	19567----	457
15676----	372	19151----	110	19672----	118
15690----	35	19153----	136	19673----	106
15729----	36	19154----	137	19674----	121
15746----	477	19155----	178	19675----	111
15904----	497	19156----	132	19676----	116
15998----	14	19157----	133	19677----	127
16316----	491	19159----	142	19678----	126
16382----	486	19160----	143	19679----	120
16383----	485	19161----	192	19680----	117
16480----	309	19162----	193	19681----	125
16481----	310	19163----	167	19682----	128
16484----	495	19164----	197	19763----	443
16529----	307	19167----	151	19825----	112
16567----	526	19229----	483	19826----	115
16571----	458	19307----	57	19827----	122
16572----	262	19394----	180	19828----	123
16587----	305	19395----	138	19829----	124
16589----	308	19396----	140	19830----	119
16741----	6	19397----	141	19831----	114
16747----	314	19398----	144	19903----	169
16748----	467	19399----	147	19904----	187
16772----	249	19400----	146	19905----	190
16827----	499	19401----	145	19906----	188
17109----	431	19402----	160	19919----	252
17152----	49	19403----	155	19920----	1
17423----	301	19404----	157	19921----	113
17596----	260	19405----	177	19942----	434

ENT-No.	Item No.	ENT-No.	Item No.	ENT-No.	Item No.
20023----	202	20224----	392	20595----	62
20034----	89	20241----	386	20597----	212
20047----	41	20293----	454	20626----	464
20127----	391	20297----	63	20640----	349
20188----	226	20299----	59	20701----	60
20216----	45	20351----	390	20888----	199
20217----	520	20397----	406	22331----	440
20218----	519	20453----	129	23818----	46
20219----	521	20553----	77	30961----	150

