ISSN 0097-0905

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By Lester Hankin and Paul E. Waggoner

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
New Haven Bulletin 836 June 1986

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A new feature of this annual Bulletin reporting the quality of pesticides and related products is information on the quantity of restricted pesticides sold in Connecticut.

When the Connecticut Act regulating the distribution, sale and transportation of pesticides became effective in 1964, it required that the Commissioner of the Department of Agriculture and Natural Resources and the Director of this Station purchase and analyze samples of pesticides offered for sale in Connecticut and publish the results. Beginning with the report of inspections for 1964 published in Bulletin 682 of this Station, the character and composition of pesticides has been reported annually.

People are worried about pesticides. To learn whether we should worry more or less, the logical course is first learning the quantity sold.

Section 22a-50 of the Connecticut General Statutes specifies that pesticides that may adversely affect the environment shall be classified for "restricted use" by the Commissioner of Environmental Protection. The law states: "In the event that the commissioner determines that the pesticide, when applied in accordance with its directions for use, warnings and cautions and for the uses for which it is registered, or for one or more of such uses, or in accordance with a widespread and commonly recognized practice, may generally cause, without additional regulatory restrictions, unreasonable adverse effects on the environment, including injury to the applicator, he shall classify the pesticide, or the particular use or uses to which the determination applies, for restricted use...." Thus, examining the restricted pesticides is examining the potent ones.

Beginning in 1979, Stephen Hitchcock and Bradford Robinson of the Department of Environmental Protection have recorded the sales of restricted pesticides sold in the state. The quantity of pesticides sold, of course, does not precisely show use. Use is the sales in the State, plus the pesticides bought outside the State and used here, and minus the pesticides bought here and used elsewhere. Although the sales are not precisely the use, the sales do show where large quantities are used and indicate the trend in the use of potent pesticides.

The sales of restricted pesticides for 1979 to 1984 were reported in Bulletin 831 of the Station, which answered the question: "Where is the next strategic place to reduce pesticide use?" The quantity and toxicity of restricted pesticides sold changed little from 1979 to 1984. A surprisingly large portion of the restricted pesticides sold was used to manage pests in the soil. Thus, the answer to the question is "In the soil". Bulletin 831 promised that with the cooperation of the Department of Environmental Protection the Station would continue to publish the quantity of restricted pesticides sold in the State, and that promise is fulfilled in Table 1 of this Bulletin.

The amount of restricted pesticides sold in Connecticut was less in 1985 than during any of the years from 1979 through 1984.

To reveal the cause of this substantial decrease, the pesticides were first classified into broad groups according to the pests they were intended to control: rodents; weeds, fungi, and

Table 1. The quantity of active ingredients in restricted pesticides sold annually in Connecticut and recorded by the Department of Environmental Protection. To show the trend in sales, the quantity of all ingredients sold is shown. To show the use of the pesticides, the percentages of the annual total sold for the control of five classes of pests are tabulated. The gaseous fumigant, methyl bromide, and a small quantity of "other" are tabulated separately.

Pest	Year						
	1979	1980	1981	1982	1983	1984	1985
	Metric tons sold						
All	103	107	118	98	89	103	75
	Quantity sold for control of groups of pests shown as percentage of total quantity sold.						
Rodents	<1	<1	<1	<1	<1	<1	<1
Weeds	23	24	33	28	23	18	24
Fungi	2	9	5	2	2	1	2
Insects	10	11	11	8	10	13	14
Soil pests	60	50	42	57	58	56	53
Methyl bromide	5	6	9	5	8	12	6
Other	<1	<1	<1	<1	<1	0	<1

insects controlled by spraying; soil pests, such as nematodes and insects controlled by injection or drenching of the soil; the gaseous fumigant methyl bromide; and a miscellany including bird repellants. The sales of each group is shown as a percentage of the annual totals. Although soil pesticides comprised more than half the weight sold in 1985 as they had during 1979-1984, their percentage fell from 56 to 53%. Between 1984 and 1985 the sale of methyl bromide fell from 12 to 6% of the total weight sold.

Since sales of methyl bromide and, especially, soil pesticides are large but comprised a smaller percentage of the total in 1985 than in 1984, their decrease was obviously the major cause of the decrease in sales from 1984 to 1985 of all restricted pesticides. Whereas the sales of pesticides for rodents, weeds and fungi changed less than a ton between the years and sales of insecticides declined only 2 tons, the sales of methyl bromide decreased 7 tons and of soil pesticides fully 18 tons.

Toxicity as well as quantity of pesticides is, of course, important. In Bulletin 831 a measure called "Hazard" was calculated by dividing the quantity of a pesticide ingredient sold by the dose that is acutely toxic to 50% of a group of test animals. This dose is called LD50 and is expressed as mg dose per kg body weight of the test animals, which are usually rats. LD50 was available from the literature for 96 of the 103 active ingredients sold sometime during 1979-85; methyl bromide is the only ingredient sold in large quantity that has no published LD50. Hazard was calculated for the 96. During 1979-84 this Hazard changed little. From 1984 to 1985, however, Hazard decreased fully 32%, and 26 of the 32 percentage points or eight-tenths of the total decrease were the decrease in the Hazard of soil pesticides.

Although one may not be certain how this remarkable decrease in the sales of potent soil pesticides came about, it is reasonable to attribute it to a logical response to the discovery in groundwater of the soil pesticide, ethylene dibromide or EDB. Since no EDB had been sold in Connecticut during 1979-84, its prohibition in the winter of 1984-85 could not cause the decrease in sales of pesticides. Rather, the discovery of EDB in groundwater and the ensuing troubles evidently evoked widespread and voluntary restraint in using all soil pesticides despite the need to control the pests. Since soil pesticides are the strategic place to reduce pesticide use, the total sales of all restricted pesticides fell by a quarter and the Hazard of all restricted pesticides fell by a third in a single year.

A cost was, of course, exacted for the decrease. In one example, a survey for nematode-free soil by the scouts of this Station was substituted for the treatment of land. In another the laborious dipping by nurserymen of plants in containers was substituted for the treatment of soil with EDB. In these cases, the cost exacted was labor. In other cases the cost may have been smaller yield. Although the Station is experimenting with a range of alternative treatments to manage soil pests, pesticides are still the most effective means, and the decreased use of soil pesticides may have exacted a toll of decreased yield. Despite these costs, however, the goal of reducing pesticide use was achieved during 1985. Pesticide sales in 1986 will show if this reduction in the use of pesticides is a trend.

Now, we turn to the report of the quality of pesticides that continues the series begun with sampling in 1964.

The quality of pesticides, pool products, and pet preparations collected during 1985 is shown by the chemical analyses reported in this Bulletin. The 257 samples were collected by inspectors of the Connecticut Department of Environmental Protection.

Table 2 shows individual samples representing 403 guarantees for active ingredients from 65 manufacturers. The manufacturers of three samples were not known. Following the names of the manufacturers are the brands of the products and the active ingredients. The percent guarantee is then shown followed by the percent found. Values followed by a minus sign (-) were deficient in amount of active ingredient; values followed by a plus sign (+) were excessive.

Two criteria determine if samples are satisfactory. The first is that a sample cannot contain a deficiency or excess of active ingredient. Deficiencies and excesses are determined according to Laboratory Verification Guidelines established by the U.S. Environmental Protection Agency. Overall, 5.8% of the 254 samples were deficient in at least one active ingredient and 0.8% were excessive in at least one active ingredient. For 403 guarantees for active ingredient, only 4.8% were deficient and 0.5% were excessive. The second criterion is that a sample is unsatisfactory if it contains an ingredient not listed on the label. No unlisted ingredients were found in any samples tested.

Table 3 summarizes the number of samples tested from each manufacturer, the number of guarantees for active ingredients, the number of deficiencies or excesses, and the average percent of guarantee.

Analyses were performed by Martha Fuzesi, Richard Hastings, Mary Alice DeFrancesco, and Dennis Migneault. Samples were collected by Marshall Beott, Douglas Griswold, and Maria Walker. Pesticide laws are administered by the Commissioner of the Department of Environmental Protection.

Table 2. Analysis of Individual Samples.

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
3 M Agricultural Products		
Embark 2-S Plant Growth Regulator		
Mefluidide (Diethanolamine salt)	28	28.7
Aeroxon Products, Inc.		
Roro Magikil Roach & Carpenter Ant Traps		
Baygon	1	1.1
Agway, Inc.		
Agway 25% Methoxychlor Spray		
Methoxychlor	25.00	24.05
Agway 5% Sevin Dust		
Carbaryl	5.0	5.60
Agway Ant & Soil Insect Granules		
Diazinon	5	4.70
Agway Asparagus - Berry Weeder		
Simazine	4	3.88
Agway Diazinon Insect Spray		
Diazinon	25	25.10
Agway Dormant Oil with Ethion		
Ethion	2.0	1.99
Agway Face Fly Spray		
Vapona	0.814	0.795
Agway Folpet 50W		
Folpet	50	49.6
Agway Fruit Tree Spray		
Captan and related compounds	12.00	12.02
Malathion	3.50	4.74
Methoxychlor	12.00	12.61
Carbaryl	3.00	3.25
Agway Home Pest Insect Control		
Pyrethrins	0.052	0.053
Piperonyl butoxide, tech.	0.260	0.270
Dursban	0.500	0.433
Agway Insect Spray w/Malathion		
Malathion	55.00	56.80
Agway Iris Borer & Leaf Miner Spray		
Dimethoate	23.40	22.90
Agway Lawn Insect Control with Dursban		
Chloropyrifos	22.4	24.18
Agway Lawn Weed Killer		
2,4-D (Diethanolamine salt)	18.2	19.5
Dicamba (Diethanolamine salt)	1.9	1.93
Agway Liquid Sevin 4F		
Carbaryl	42.6	42.5
Agway Maneb 2F		
Maneb	18.5	20.22
Agway Organic Garden Spray		
Pyrethrins	1.0	0.98
Piperonyl butoxide, tech.	10.0	9.75
Agway Pantry Pest Spray		
Tetramethrin	0.200	0.186
d-Phenothrin	0.191	0.188
Agway Poison Ivy - Poison Oak Killer		
Glyphosate	0.96	0.90
Agway Rotenone Dust		
Rotenone	1.00	1.20
Agway Seed Potato Dust		
Mancozeb	8.0	7.94
Agway Super BK32 Herbicide		
2,(2,4-Dichlorophenoxy) propionic acid butoxy ethyl ester	16.4	16.41
2,4-Dichlorophenoxyacetic acid butoxyethyl ester	16.7	17.90

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Agway Swat II		
Tetramethrin	0.200	0.186
d-Phenothrin	0.191	0.180
Agway Tomato & Vegetable Insect Spray		
Pyrethrins	0.02	0.023
Piperonyl butoxide, tech.	0.20	0.196
Agway Total Weed Killer		
Prometon	1.6	1.65
Agway Vegetable Garden Dust		
Malathion	5.6	6.1
Methoxychlor	5.0	5.0
Captan & related compounds	7.0	7.3
Agway Weed and Brush Killer with Ammate		
Ammonium Sulfamate	46.5	47.2
Agway Zineb Garden Fungicide		
Zineb	75	76.48
Custom-blend formulation of 24-10-18		
Fert/Bicep Herbicide		
Atrazine	0.504	0.438
Metolachlor	0.633	0.574
Amchem Products, Inc.		
Super D Weedone		
2,4-D (Diethanolamine salt)	20.3	21.0
Dicamba (Diethanolamine salt)	1.9	1.84
American Hoechst Corp.		
Acclaim 1 E.C. Herbicide		
Ethyl 2-[4-[(6 chloro-2-benzoxazoly) oxy]phenoxylpropanoate	12.50	12.20
Amrep, Inc.		
Value Line Residual Insect Killer		
Piperonyl butoxide, tech.	0.100	0.100
Pyrethrins	0.050	0.048
n-Octyl bicycloheptene dicarboximide	0.166	0.160
o-Isopropoxyphenyl methylcarbamate	0.500	0.518
Athena Products Corp		
Echols Flea and Tick Spray		
Baygon	0.25	0.27
Bell Labs, Inc.		
Gopha-Rid Kills Gophers and Moles		
Zinc phosphide	2	2.41
PCO Rat and Mouse Bait		
Diphacinone	0.005	0.0056
Black Leaf Prod. Co.		
Black Leaf 50% Malathion Spray		
Malathion	50.00	49.70
Black Leaf Giant Roach Traps		
Baygon	2.00	2.05
Black Leaf Kelthane Mite Killer		
Kelthane	18.5	18.70
Black Leaf Liquid Fruit Tree Spray		
Captan	12.0	11.6
Malathion	6.0	5.6
Methoxychlor	12.0	11.8
Carbaryl	0.3	0.30
Black Leaf Rose and Flower Spray		
Metasystox	11.74	11.85
Karathane	1.280	1.470
Bliss Ext. Co.		
SMCP Dursban 2E (dilute solution)		
Dursban	0.25	0.107-

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Bonide Chem. Co.		
Bonide Benomyl 50% WP		
Benomyl	50	50.90
Bonide Bulb Dust		
Methoxychlor	5.0	4.85
Thiram	10.0	9.81
Bonide Captan 50% WP		
Captan	50	50.93
Bonide Kelthane EC		
Kelthane	18.5	17.93
Bonide Lawn + Garden Insect Control with Diazinon 12 1/2 E		
Diazinon	12.5	21.6+
Bonide Malathion 50% EC		
Malathion	50	49.6
Bonide Methoxychlor 25% E Insecticide		
Methoxychlor	25	25.33
Bonide Moletox II		
Zinc Phosphide	2	2.09
Bonide Rose Spray		
Carbaryl	10.00	10.69
Captan	10.00	4.00-
Karathane	1.00	1.10
Kelthane	0.50	0.60
Malathion	0.96	0.49-
Bonide Sevin 2 Flowable Insecticide		
Carbaryl	22.5	23.4
Bonide Systemic Granules 1%		
Disyston	1	1.02
C & J Chemical, Inc.		
Enforcer Flea + Roach Fogger		
Allethrin	0.300	0.330
Phenothrin	0.191	0.225
Enforcer Flea Killer for Pets		
Pyrethrins	0.10	0.11
MGK-264	0.33	0.40
Piperonyl butoxide, tech.	0.20	0.20
Enforcer Flea Killer for Carpets		
Pyrethrins	0.200	0.200
MGK-264	0.668	0.730
Piperonyl butoxide, tech	0.400	0.403
Enforcer Flea Spray for Carpets & Furniture		
Phenothrin	0.478	0.545
Enforcer House, Garden & Flying Insect Killer		
Tetramethrin	0.200	0.192
Phenothrin	0.191	0.197
Enforcer Moth Proofer		
Tetramethrin	0.200	0.186
Phenothrin	0.191	0.192
Enforcer Mouse Kill		
Brodifacoum	0.005	0.0045
Enforcer Rat Bait		
2,Pivalyl-1,3-Indandione	0.025	0.026
Enforcer Roach Ridd		
Ortho Boric Acid	99	99.0
Enforcer Wasp & Hornet Killer		
(5-Benzyl-3-furyl) methyl 2,2-dimethyl-3-(2-methyl propenyl) cyclopropane carboxylate	0.25	0.26
Cadwell & Jones		
Cadwell + Jones Specialty Fertilizer 25-0-0 Oftanol		
Oftanol	none	0.668

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Carter-Wallace, Inc.		
Victory Flea Soap for Dogs		
Pyrethrins	0.025	0.026
Piperonyl butoxide, tech.	0.050	0.055
n-Octylbicyclopheptene dicarboximide	0.083	0.081
3,4,4-Trichlorocarbanilide	1.000	1.04
Victory Indoor Fogger Flea and Tick Killer		
Baygon	1.00	1.09
DDVP	0.47	0.46
Victory Insecticide Pump Spray for Dogs		
Pyrethrins	0.06	0.063
Piperonyl butoxide, tech.	0.60	0.560
Victory Veterinary Formula Flea & Tick Killer		
Carbaryl	5.0	5.05
Victory Veterinary Formula Flea & Tick Spray		
Carbaryl	1.00	1.10
Pyrethrins	0.06	0.05
Piperonyl butoxide, tech.	0.60	0.54
Celex Corp.		
Super K-Gro All Purpose Fruit and Vegetable Spray		
Captan	12.0	11.92
Malathion	6.0	6.78
Methoxychlor	12.0	12.76
Carbaryl	0.3	0.34
Super K-Gro Broadleaf Weed Killer		
MCPP (Diethanolamine salt)	0.180	0.204
2,4-D (Diethanolamine salt)	0.168	0.192
Dicamba (Diethanolamine salt)	0.017	0.014
Super K-Gro Crab Grass Killer		
Calcium acid methanearsonate	0.50	0.526
Charles O. Finley & Co.		
New Plant Life Duet Insecticide & Leaf Shine		
Pyrethrins	0.01	0.013
Chemsico, Inc.		
K-Rid Ant and Roach Killer		
Dursban	0.500	0.570
Allethrin	0.050	0.054
K-Rid Home Fogger		
Dursban	0.500	0.580
Allethrin	0.050	0.057
K-Rid House and Garden Bug Killer		
Pyrethrins	0.25	0.26
Piperonyl butoxide, tech.	1.00	1.00
Chemtech International Chem., Inc.		
B-Free of Flies Bug Killer for Flies		
Pyrethrin	0.22	0.223
di-n-Propyl isocinchomeronate	1.17	1.50
Chevron Chem. Co.		
Ortho 3-Way Rose and Flower Care		
Disyston	1.00	1.20
Trifluralin	0.174	0.197
Ortho Ant, Roach & Spider Killer		
Baygon	1.0	1.00
Ortho Brush B Gon Brush Killer		
Triclopyr (Triethylamine salt)	8.0	8.15
Ortho Contax Weed + Grass Killer		
Arsenic, total	5.80	7.26
Ortho Diazinon Granules		
Diazinon	2	2.07
Ortho Diazinon Soil and Foliage Dust		
Diazinon	4	4.60

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Ortho Diquat Water Weed Killer		
Diquat dibromide	35.3	40.9
Ortho Dyrene Lawn Disease Control		
Dyrene	50	50.7
Ortho Flotox Garden Sulfur		
Sulfur	90	88.5
Ortho Flying & Crawling Insect Killer		
Resmethrin	0.250	0.259
Ortho Fruit and Vegetable Insect Control		
Diazinon	25	25.2
Ortho Funginex Rose Disease Control		
Triforine	6.5	6.75
Ortho Garden Weed Preventer		
Dacthal	5.0	5.30
Ortho Home & Garden Insect Killer		
Resmethrin	0.250	0.260
Ortho Home Orchard Spray		
Captan and related derivatives	15.0	15.3
Malathion	7.5	9.0
Methoxychlor	15.0	14.40
Ortho Home Pest Insect Control		
Chlorpyrifos	0.50	0.47
Ortho Household Insect Killer		
Resmethrin	0.250	0.245
Ortho Kleen up Spot Weed & Grass Killer		
Glyphosate	0.75	0.72
Ortho Kleenup		
Glyphosate	0.50	0.53
Ortho Lindane Borer and Leaf Miner Spray		
Lindane	20	19.8
Ortho Liquid Sevin		
Carbaryl	27	28.4
Ortho Orthocide (Captan) Garden Fungicide		
Captan and related derivatives	50.0	49.69
Ortho Orthoklor Indoor and Outdoor Insect Killer		
Dursban	1.0	1.07
Ortho Pest B-Gon Roach Bait		
Baygon	2	2.40
Ortho Phaltan Rose & Garden Fungicide		
Folpet	75	75.2
Ortho Poison Ivy & Poison Oak Killer		
2,4-D (Diethanolamine salt)	0.70	0.83
MCPP (Diethanolamine salt)	0.75	0.81
Ortho Rose and Floral Dust		
Carbaryl	3.0	3.5
Malathion	4.0	4.6
Folpet	5.0	6.2
Kelthane	1.5	1.52
Ortho Rose and Flower Insect Killer		
Pyrethrins	0.02	0.019
Piperonyl Butoxide, tech.	0.20	0.196
Ortho Rotenone Dust or Spray		
Rotenone	1.0	1.00
Ortho Sevin Garden Dust		
Carbaryl	5	4.9
Ortho Sevin Garden Spray		
Carbaryl	50	50.9
Ortho Systemic Rose and Flower Care		
Disyston	1.0	1.00
Ortho Tomato and Vegetable Insect Killer		
Pyrethrins	0.02	0.0196
Piperonyl butoxide, tech.	0.20	0.125-
Ortho Tomato Vegetable Dust		
Captan and related derivatives	5.00	5.60
Methoxychlor	5.00	5.10
Rotenone	0.75	0.83

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Ortho Triox Vegetation Killer		
Prometon	1.86	1.85
Ortho Vegetable Disease Control		
Chlorothalonil	29.6	28.9
Ortho Vegetable Guard Soil Insect Killer		
Diazinon	5	4.98
Ortho Weed-B-Gon Weed Killer		
2,4-D (Dimethylamine salt)	0.20	0.270
MCPP (Dimethylamine salt)	0.20	0.250
Ciba-Geigy Corp.		
Spectracide Crawling Insect Control Granules		
Diazinon	5	5.2
Spectracide Garden, Rose and House Plant Spray		
Diazinon	0.5	0.452
Spectracide Lawn and Garden Insect Control		
Diazinon	25	23.9
Spectracide Professional Flea Control		
Methoprene	0.15	0.154
Spectracide Professional Home Pest Control XP		
Diazinon	1.00	0-
Spectrum 33 Plus Lawn Weed Killer		
MCPP (Dimethylamine salt)	10.89	11.15
Dicamba (Dimethylamine salt)	1.20	1.30
2,4-D (Dimethylamine salt)	5.87	6.59
Connecticut Aerosols Inc.		
707 Automatic Indoor Fogger Roach Bomb		
3-phenoxybenzyl d-cis & trans 2,2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate	0.191	0.190
Allethrin	0.300	0.302
707 Automatic Indoor Fogger Roach Bomb		
3-Phenoxybenzyl d- cis & trans 2, 2 dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate	0.191	0.203
Allethrin	0.300	0.303
707 Automatic Indoor Fogger Roach Bomb		
3-Phenoxybenzyl d-cis & trans 2,2 dimethyl-3-(2-methyl propenyl) cyclopropanecarboxylate	0.190	0.199
Allethrin	0.300	0.310
707 Automatic Indoor Fogger Roach Bomb		
Tetramethrin	0.200	0.214
Cyano (3-phenoxypheny1) methyl-4-chloroalpha-(1-methyl ethyl) benzeneacetate	0.400	0.408
Johnston's Hadabug 11		
Tetrametrhin	0.250	0.182-
Phenothrin	0.143	0.102-
Johnston's No-Roach Indoor Fogger		
Tetramethrin	0.200	0.199
3-Phenoxybenzyl d-cis & trans 2,2 dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate	0.382	0.366
Johnston's No-Roach 1		
D-Trans Allethrin	0.050	0.048
Chlorpyrifos	0.500	0.493
n-Octyl bicycloheptene dicarboximide	0.400	0.375
Mr. Destroyer Roach & Ant Killer		
Pyrethrins	0.050	0.049
Chlorpyrifos	0.500	0.482
Piperonyl butoxide, tech.	0.100	0.092
n-Octyl bicycloheptene dicarboximide	0.166	0.170
Rite Aid Spray Disinfectant		
o-Phenylphenol	0.109	0.09
n-Alkyl dimethyl ethylbenzyl Ammonium Chlorides	0.035	0.026-
Swell Ant & Roach Killer		
2- (1-methylethoxy) phenol methylcarbamate	0.500	0.502
2,2-Dichlorovinyl dimethylphosphate	0.237	0.235

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Swell Ant & Roach Killer		
2- (1- methylethoxy) phenol methylcarbamate	0.500	0.507
2,2-Dichlorovinyl dimethylphosphate	0.237	0.232
Contact Industries		
United Van Lines Sanitized Brand Van Interior Fogging Spray		
Pentachlorophenol	0.10	0.11
Pyrethrins	0.50	0.51
Piperonyl butoxide, tech.	1.00	0.87
n-Octyl bicycloheptene dicarboximide	1.67	1.53
United Van Lines Sanitized Brand Van Interior Fogging Spray		
Pentachlorophenol	0.10	0.047-
Pyrethrins	0.50	0.49
Piperonyl butoxide, tech.	1.00	0.87
n-Octyl bicycloheptene dicarboximide	1.67	1.43-
Croak-a-Roach, Inc.		
Croak-a-Roach Boric Acid Roach Killer		
Boric Acid	100	100
d-Con Co., Inc.		
d-Con Exact Roach & Ant Killer		
Cyano(3-phenoxyphenyl)methyl 4-chlor-alpha-(1-methylethyl)benzene acetate	5.00	4.92
d-Con Flea & Tick Killer II		
Allethrin	0.150	0.158
Phenothrin	0.096	0.098
n-Octyl bicycloheptene dicarboximide	1.250	1.426
d-Con Flea Kill Home Fogger		
Precor	0.150	0.170
Baygon	1.000	1.200
DDVP	0.470	0.550
d-Con Four/Gone Formula IV		
Allethrin	0.300	0.320
Phenothrin	0.191	0.210
DDVP	0.465	0.445
d-Con Mouse Prufe Kills Mice		
Warfarin	0.054	0.057
d-Con Roach-Prufe		
Resmethrin	0.500	1.02+
d-Con Warpath Roach Killer		
Pyrethrins	0.1	0.105
Piperonyl butoxide	1.0	0.93
Dexol Ind.		
Dexol Benomyl Systemic Fungicide		
Benomyl	50	51.8
Dexol Borersol		
Ethylene dichloride	50	48.60
Dexol Calsul Dormant Spray		
Calcium polysulfide	1.0	0.99
Mineral oil	67.9	69.8
Dexol Cygon Systemic Insecticide		
Dimethoate	23.4	22.3
Dexol Dexa-Klor Dust		
Bendiocarb	1.0	1.00
Dexol Dexa-Klor Granules		
Dursban	0.5	0.46
Dexol Diazinon Insect Spray		
Diazinon	25.0	25.40
Dexol Kelthane		
Kelthane	18.5	18.32

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Dexol Lawn Weed Killer		
MCPP (Dimethylamine salt)	3.66	3.57
2,4-D (Dimethylamine salt)	8.07	7.78
Dicamba (Dimethylamine salt)	0.84	0.80
Dexol Multi-Purpose Spray		
Metasystox	11.74	12.04
Karathane	1.280	1.176
Dexol Red Spider and Mite Spray		
Kelthane	0.046	0.040
Dexol Rose and Flower Dust		
Carbaryl	5.00	4.74
Kelthane	3.00	3.28
Karathane	1.00	1.00
Zineb	3.00	2.95
Dexol Sow-Bug Cut Worm Bait		
Carbaryl	5	5.5
Dexol Systemic Granules Insect Control		
Disyston	1.0	1.03
Dexol Tender Leaf Plant Fungicide		
Benomyl	50	50.8
Dexol Tomato and Vegetable Dust		
Carbaryl	5.0	5.2
Zineb	4.5	4.12
Dexol Vegetable Garden Insect Spray		
Pyrethrins	0.02	0.018
Piperonyl butoxide, tech.	0.20	0.106-
Dexol Whitefly & Mealybug Killer		
Tetramethrin	0.0286	0.0024-
Phenothrin	0.0547	0.0354-
Dexol Zineb Garden Fungicide		
Zineb	75	73.45
Dragon Chem. Co.		
Dragon Gopher & Mole Killer Pellets		
Zinc phosphide	2	2.43
Duphar B. V.		
Diflubenzuron, 90% tech.		
Diflubenzuron	90.0	90.10
Diflubenzuron, 90.5 % tech.		
Diflubenzuron	90.5	90.47
Eboneen Products Co., Inc.		
Boric Acid Roach Busters Roach Killer		
Boric Acid	100	100
Boric Acid Roach Busters Roach Killer		
Boric Acid	100	100
Farnam Co.		
Farnam Herbal Flea Halt for Carpets		
Pyrethrins	0.50	0.51
Farnam Rabbit Ear Miticide		
Pyrethrins	0.05	0.053
Piperonyl butoxide, tech.	0.50	0.27-
Farnum Flyies		
Pyrethrins I & II	0.2	0.21
Di-n-propyl isocinchomeronate	1.0	1.00
Piperonyl butoxide, tech.	0.5	0.46
Just One Bite Rat & Mouse Bait		
Bromadiolone	0.005	0.0042
Gaston Johnston Corp.		
Johnstons No Roach		
Malathion	0.7	0.75
Diazinon	0.3	0.31

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Hartz Mountain Corp.		
Hartz 2 in 1 Flea & Tick Powder for Dogs		
2-Chloro-1-(2,4,5-trichlorophenyl) Vinyl dimethyl phosphate	3.0	3.10
ICT Americas, Inc.		
Havoc Rodenticide Bait Pack		
Brodifacoum	0.005	0.0048
International Spike		
Jobe's Insecticide for Evergreen Shrubs		
Disyston	1	1.09
Jobe's Insecticide for Flowering Shrubs		
Disyston	1	1.03
It Works		
IT WORKS		
Boric acid	40	44.4
Sulfur	5	4.85
The Original Roach Croaker		
Boric acid	50	51.7
J & L Adikes, Inc.		
Gro-Well Benomyl Fungicide		
Benomyl	50.00	51.40
Gro-Well Bordeaux Mixture		
Copper	12.75	13.55
Gro-Well Borer Killer		
Lindane	5	4.9
Gro-Well Zineb Fungicide		
Zineb	75.00	86.46
King Company		
King Cockroach Killer		
Boric Acid	99.9	97.6
King Cockroach Killer		
Boric Acid	99.9	98.9
King Cockroach Killer		
Boric Acid	99.9	98.2
Knight Oil Corp.		
Knight Spray Nine		
n-Alkyl dimethyl benzyl ammonium chloride	0.19	0.15
n-Alkyl dimethyl ethylbenzyl ammonium chloride	0.19	0.15
Sodium metasilicate	0.57	0.67
Lynwood Labs		
Shoo-fly Hornet Jet Bomb		
Diazinon	0.500	0.500
Pyrethrins	0.025	0.027
Piperonyl butoxide, tech.	0.262	0.235
Miller Chem. & Fert./Pratt Gabriel Div.		
Pratt Bordo-Mix		
Copper	12.75	12.38
Pratt Diazinon AG 4 E Insect Spray		
Diazinon	48	47.2
Pratt Fruit Tree Spray		
Malathion	6.0	7.70
Methoxychlor	10.0	9.77
Captan	6.0	5.80
Sulfur	25.0	25.20
Pratt Methoxychlor-25 Insect Spray		
Methoxychlor	25.0	25.30

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Pratt Red Arrow Insect Spray		
Pyrethrins	0.5	0.57
Rotenone	1.5	1.57
Piperonyl butoxide, tech.	3.0	3.06
Pratt Tomato and Vegetable Dust or Spray		
Rotenone	0.75	0.86
Copper	7.00	7.05
Miller Chem. & Fert./Science Prod. Div.		
Science Systemic Insecticide Granules		
Disyston	1	0.98
Morton Thiokol, Inc.		
No-Pest Flea and Tick Killer		
Dursban	0.50	0.30-
No-Pest Home Insect Control		
Diazinon	0.500	0.505
Pyrethrins	0.052	0.058
Piperonyl butoxide, tech.	0.260	0.250
No-Pest Professional		
Resmethrin	0.10	0.09
Dursban	0.50	0.49
Nott Mfg. Co.		
Nott Mole - Nots		
Zinc phosphide	2.0	2.2
Old Fox Chemical Co.		
Trimec Turf Ester		
2,4-D (Isooctyl ester)	unknown	31.48
2,4-DP (Butoxyethanol ester)	unknown	29.30
Dicamba acid	unknown	5.1
Oxford Chem., Inc.		
Oxford D'Germ		
Phosphoric acid	22.50	22.47
Dodecyl benzene sulfonic acid	14.55	14.53
Isopropanol	14.00	12.70
Hydrogen chloride	4.71	4.70
Sulfuric acid	0.07	0.07
Methyl salicylate	0.50	present
Oxford Spra-Fect		
o-Phenylphenol	0.216	0.239
p-Tertiary-amylphenol	0.054	0.053
Pace National Corp.		
Deadline		
Metaldehyde	4	3.26
Parrott Agro-Ind., Inc.		
Parrott Multi-Purpose Maltox		
Malathion	15	15.63
Methoxychlor	20	20.07
Dichlone	1.80	1.74
Pennwalt Corp.		
Penn Walt Endothall Turf Herbicide		
Endothall (Disodium salt)	19.2	19.00
Pet Chem., Inc.		
Hill's Holiday Flea and Tick Shampoo		
d-Limonene	5.0	5.00
Hill's Holiday Flea and Tick Spray		
d-Limonene	5.0	4.80
Hills Holiday Flea and Tick Dip		
d-Limonene	78.20	76.80

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Pic Corp.		
Pic Roach Killer		
Boric Acid	100	100
Realex Corp.		
Super K-Gro Spot Weed Killer		
2,4-D (Dimethylamine salt)	0.260	0.468+
Dicamba (Dimethylamine salt)	0.025	0.022
MCPP (Dimethylamine salt)	0.261	0.293
Super K-Gro Tomato and Vegetable Insect Spray		
Pyrethrins	0.02	0.020
Piperonyl butoxide, tech.	0.02	0.020
Residex Corp.		
Pest Pro Power Wasp and Hornet Freeze		
Rotenone	0.12	0.124
Pyrethrins	0.058	0.064
Pest Pro X-tra Strength Fogger Insectcide		
Baygon	1.00	1.00
DDVP	0.47	0.49
Roach Croaker		
Roach Croaker		
Boric Acid	45	45.0
Rockland Chem. Co., Inc.		
Rockland Benomyl		
Benomyl	50	51.0
Rockland Liquid Fruit Tree Spray		
Captan	11.35	11.69
Malathion	6.00	3.17-
Methoxychlor, tech.	12.00	12.00
Carbaryl	3.00	3.02
Rockland Maneb Fungicide		
Maneb	80	67.09-
Rockland Methoxychlor 2B		
Methoxychlor, tech.	25	26.89
Rockland Sevin 2 Flowable		
Carbaryl	22.5	22.0
Rockland Zineb Garden Fungicide		
Zineb	75	68.22-
Super K-Gro Broadleaf Weed Killer		
MCPP (Dimethylamine salt)	3.66	3.81
2,4-D (Dimethylamine salt)	7.59	8.06
Dicamba (Dimethylamine salt)	0.84	0.77
Super K-Gro Diazinon Spray		
Diazinon	25.00	25.40
Super K-Gro Malathion		
Malathion	50.0	48.6
Super K-Gro Rose and Floral Dust		
Carbaryl	3.0	3.2
Malathion	4.0	3.9
Folpet	5.0	5.3
Kelthane	1.5	1.5
Super K-Gro Tomato-Vegetable Dust		
Rotenone	1.0	1.06
Copper	7.0	7.6
S. C. Johnson & Sons, Inc.		
Raid Ant & Roach Killer, Professional Strength		
Baygon	0.95	1.02
Raid Ant & Roach Killer		
Baygon	0.665	0.661
DDVP	0.186	0.213
Raid Crack & Crevice Spray Formula II		
Dursban	0.50	0.51

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Raid Flea Killer II		
Precor	0.03	0.037
Pyrethrins	0.20	0.19
Piperonyl butoxide, tech.	1.00	0.96
n-Octyl bicycloheptone dicarboximide	1.00	1.06
Raid Home Insect Killer		
Dursban	0.50	0.48
Raid Tomato & Vegetable Fogger		
Pyrethrins	0.2	0.195
Raid Wasp & Hornet Killer		
Baygon	0.475	0.490
Tetramethrin	0.252	0.275
Science Products Co., Inc.		
Science 5% Sevin Dust		
Carbaryl	5.0	5.5
Science Garden Weeder		
Dacthal	5.0	4.06-
Senoret Chem. Co., Inc.		
Terro Ant Killer		
Sodium arsenate	2.27	2.06
Sterling Drug/Lehn & Fink Prod. Div.		
Lysol Disinfectant Spray		
o-Phenylphenol	0.1	0.10
Lysol Disinfectant Spray		
o-Phenylphenol	0.1	0.09
Superior Sales Co., Inc.		
Mean Green		
Octyl decyl dimethyl ammonium chloride	0.54	0.55
Dioctyl dimethyl ammonium chloride	0.27	0.27
Didecyl dimethyl ammonium chloride	0.27	0.27
Alkyl dimethyl benzyl ammonium chloride	0.72	0.73
Spearmint		
Alkyl dimethyl benzyl ammonium chloride	2	2.08
Swift Agric. Chem. Corp.		
Vigoro Rotenone Insecticide		
Rotenone	1.00	1.03
Union Carbide		
Aldicarb (Temik 10G)		
Aldicarb	10	9.9
Super D Weedone Lawn Weed Control		
2,4-D (Diethanolamine salt)	20.3	20.4
Dicamba (Diethanolamine salt)	1.9	1.96
Unknown Manufacturers		
Rozol Rat & Mouse Killer		
Chlorophacinone-Liphadione	0.005	0.0043
York Mouse & Rat Pack with Rozol		
Chlorophacinone	0.005	0.0049
Talon-9		
Brodifacoum	0.005	0.0042
Velsicol Chem. Corp.		
Gold Crest Ramik Pro Rodenticide Bait Pack		
Diphacinone	0.005	0.0052
Walco-Linck Co.		
Tat Heavy Duty Aerosol Wet Spray		
Pyrethrins	0.075	0.099
Piperonyl butoxide	0.375	0.407
Tat Roach Trap		
Baygon	2.00	1.98

Table 2. Analysis of Individual Samples (continued).

Manufacturer, Product Name & Active Ingredient	% Guarantee	% Found
Woodlet's, Inc.		
Woodlet's Ozium Glycolized Air Sanitizer		
Triethylene glycol	4.4	4.20
Propylene glycol	4.4	4.75
Woolfolk Chem. Works, Inc.		
Security Ferbam Fungicide		
Ferbam	76.0	76.52
Security Lime Sulphur		
Calcium polysulfide	30	31.6
Security Amitrol Liquid Herbicide		
Amitrole	21.6	21.20
York Chemical Co., Inc.		
Certox Boric Acid Roach Killer		
Boric acid	99.00	99.50
Certox Last Step Rodenticide		
Brodifacoum	0.005	0.0043
York Diazinon 4 E		
Diazinon	47.50	48.00
Zena Corp.		
Zena Super Fogger		
Baygon	1.00	1.02
DDVP	0.47	0.49

Table 3. Summary for each manufacturer of number of products tested, number of guarantees for active ingredients, number of guarantees deficient or excessive, and average percentage of gurantee.

Manufacturer	Number of products tested	Number of guarantees	Number of guarantees deficient(-) or excessive(+)	Average % of guarantee
3 M Agric. Products	1	1	0	103
Aeroxon Products	1	1	0	110
Agway	29	43	0	102
Amchem Products	1	2	0	100
American Hoechst Corp.	1	1	0	98
Amrep	1	4	0	99
Athena Products Co.	1	1	0	108
Bell Labs	2	2	0	116
Black Leaf Products Co.	5	9	0	101
Bliss Ext. Co.	1	1	1-	43
Bonide Chem. Co.	11	16	2-,1+	96
C & J Chemical	10	17	0	105
Cadwell & Jones	1	0		
Carter-Wallace	5	12	0	100
Celex Corp.	3	8	0	106
Charles O. Finley & Co.	1	1	0	130
Chemsico	3	6	0	109
Chemtech International Chem.	1	2	0	115
Chevron Chem. Co.	38	50	1-	105
Ciba-Geigy Corp.	6	8	1-	90
Connecticut Aerosols	11	25	3-	96
Contact Industries	2	8	2-	89
Croak-a-Roach	1	1	0	100
d-Con Co.	7	14	1+	114
Dexol Ind.	19	29	3-	93
Dragon Chem Co.	1	1	0	122
Duphar B.V.	2	2	0	100
Eboneen Products Co.	2	2	0	100
Farnam Co.	4	7	1-	92
Gaston Johnson Corp.	1	2	0	105
Hartz Mountain Corp.	1	1	0	103
ICT Americas	1	1	0	96
International Spike	2	2	0	106
It Works	2	3	0	104
J & L Adikes	4	4	0	106
King Co.	3	3	0	98
Knight Oil Corp.	1	3	0	92
Lynwood Labs	1	3	0	99
Miller Chem. & Fert./Pratt Gabriel	6	12	0	105
Miller Chem. & Fert./Science Prod.	1	1	0	98
Morton Thiokol	3	6	1-	92
Nott Mfg. Co.	1	1	0	110
Old Fox Chem. Co.	1	0		
Oxford Chem.	2	8	0	99
Pace National Corp.	1	1	0	102
Parrott Agro Ind.	1	3	0	100
Pennwalt Corp.	1	1	0	99
Pet Chem.	3	3	0	98
Pic Corp.	1	1	0	100
Realex Corp.	2	5	1+	116
Residex Corp.	2	4	0	104
Roach Croaker	1	1	0	100
Rockland Chem. Co.	11	20	3-	98
S.C. Johnson & Sons	7	12	0	104
Science Products Co.	2	2	1-	96
Senoret Chem. Co.	1	1	0	91
Sterling Drug/Lehn & Fink Div.	2	2	0	95
Superior Sales Co.	2	5	0	101
Swift Agric. Chem. Corp.	1	1	0	103
Union Carbide	2	3	0	101
Velsicol Chem. Corp.	1	1	0	104
Walco-Linck Co.	2	3	0	113
Woodlet's	1	2	0	102
Woolfolk Chem. Works	3	3	0	101
York Chem. Co.	3	3	0	96
Zena Corp.	1	2	0	103
Total	254	403		