New Jersey Department of Environmental Protection (NJDEP)
Division of Water Resource Management
Bureau of Pesticide Control, Licensing & Registration
Pesticide Evaluation and Monitoring Section

STRUCTURAL PESTICIDE USE IN NEW JERSEY: 2023 SURVEY

Introduction

The Pesticide Evaluation & Monitoring Section (PEMS) began a series of pesticide use surveys in 1985. These surveys address pesticide use in the state of New Jersey for agriculture, golf courses, termite control, right-of-way, mosquito control, and lawn care. The structural use survey is conducted every three years and targets pesticides used for structural pest control purposes. This report focuses on the eighth survey completed in the structural use series (2023).

All statewide pesticide use surveys are performed under the authority of the New Jersey Pesticide Control Code (NJPCP), N.J.A.C. 7:30-6.8(d) requiring licensed applicators to maintain pesticide records for three years and to submit use records to the state when requested. This regulative authority provides an accuracy and level of response that is difficult to duplicate in a voluntary, nationwide survey.

The information collected from the PEMS pesticide use surveys is used by agencies within the NJ Department of Environmental Protection along with other state agencies to aid in research, exposure management and monitoring efforts in areas such as ground water protection, farm worker protection and education, and residual pesticide sampling.

Survey Methods

The NJDEP Bureau of Pesticide, Licensing and Registration's records were used to identify all 3,121 licensed commercial applicators holding a 7A (general or household pest control), 7B (termite control) or 8A (general public health) category on their license. Survey forms were mailed along with instructional letters asking for only 2023 structural pesticide use. A total of three mailings (the first to structural pest control businesses, the second to individuals and the third to non-respondents) were sent during the first four months of 2024.

The survey requested information on each pesticide product used, including trade name, EPA registration number, percent active ingredient, amounts applied, and types of pests being controlled.

Survey information was entered into a database file. This information file was then merged with a second database that linked trade names with chemical names, and a subprogram converted reported amounts of formulated product to amounts of active ingredient (lbs. a.i.).

Results & Discussion

Once all three mailings were completed, 2,116 out of 3,121 (68%) applicators were accounted for. While this response rate is consistent with the response rate in 2020 (67%), the actual number of surveys received was nearly 200 less than in 2020.We cannot determine if the low response rate is due to applicators ignoring the survey data request or if the applicators are not receiving the surveys. Many surveys are being returned because applicators are not keeping their mailing address current with the Licensing and Registration Unit. PEMS forwarded "returned to sender" surveys and a list of non-responders to the Bureau of Pesticide Control, Licensing and Registration's Enforcement unit for follow-up.

Pesticides used by the structural pest control industry in New Jersey for 2023 totaled 46,827 lbs. a.i. Table 1 lists all the compounds reported in the 2023 survey and the amounts (lbs. a.i.) applied. Insecticides comprise 89% of the total pesticide use in the New Jersey structural pest control industry. Growth regulators, rodenticides, avicides, fungicides and miscellaneous chemicals comprise the remaining 11% of pesticides applied for structural pest control.

Table 1. Pesticide amounts (lbs. a.i.) reported in the New Jersey 2023 Structural Pesticide Use Survey.
*Indicates a compound not reported in the 2020 survey.

INSECTICIDES	lbs. a.i.	INSECTICIDES	lbs. a.i.
Abamectin	9	Diatomaceous earth	257
Acephate	128	Diflubenzuron*	1
Acetamiprid	279	Dinotefuran	2,419
Alpha-cypermethrin	10	Esfenvalerate	174
Beta-cyfluthrin	574	Etofenprox	107
Bifenthrin	5,221	Fipronil	4,860
BMP 144	5	Fluvalinate	2
Borate compounds	17,056	Gamma-cyhalothrin	7
Carbaryl	5	Hydramethylnon	4
Chlorfenapyr	637	Imidacloprid	2,177
Clothianidin	308	Indoxacarb	197
Cyfluthrin	139	Isopropyl alcohol	1,550
Cypermethrin	284	Lambda-cyhalothrin	1,628
DDVP (Dichlorvos)	83	Metofluthrin	10
Deltamethrin	613	MGK 264	388

Table 1. **(cont.)** Pesticide amounts (lbs. a.i.) reported in the New Jersey 2023 Structural Pesticide Use Survey.
*Indicates a compound not reported in the 2020 survey.

INSECTICIDES	lbs. a.i.
Naphthalene	109
Pine Oil	1
Permethrin	406
Phenothrin	23
Prallethrin	55
Pyrethrins	331
S-fenvalerate*	1
S-hydropene	202
Silicon dioxide	619
Silica gel	181
Tefluthrin*	1
Tetramethrin	7
Thiamethoxam	642
Insecticide Total	**41710**

MISCELLANEOUS	lbs. a.i.
Ammonium chloride	30
Beauveria bassiana	12
DDAC	28
Piperonyl butoxide	3,776
Sulfur	435
Tetradecadienyl acetate*	19
Tricosene*	4
Miscellaneous Total	**4304**

GROWTH REGULATORS	lbs. a.i.
Novaluron	93
Noviflumuron	51
Pyriproxyfen	267
S-Methoprene	2
Growth Regulators Total	**413**

RODENTICIDES	lbs. a.i.
Brodifacoum	2
Bromadiolone	5
Cholecalciferol*	1
Difethialone	1
Diphacinone	4
Vitamin D3	1
Zinc phosphide	55
Rodenticides Total	**69**

AVICIDES	lbs. a.i.
Anthraquinone	221
Methyl athranilate	2
Avicides Total	**223**

FUNGICIDE	lbs. a.i.
Thiram*	108
Fungicides Total	108

Table 2 lists the highest use compounds in the main structural use pesticide category (lbs. a.i.). The most highly reported pesticide used in structural pest control were borate compound. Borate compounds accounted for approximately 36% of the total pesticides applied for structural pest control in New Jersey in 2023. Borate compounds can be found in liquid, granular and gel baits, as well as dusts. They act as stomach poisons and desiccants, and when ingested they disrupt the insects' digestive system causing death. The second most heavily used pest control chemical is the insecticide bifenthrin (11% of New Jersey total). Bifenthrin is a synthetic pyrethroid

insecticide that has been registered in the Unites States since 1985. Bifenthrin products include aerosols, granules and sprays and targets indoor and outdoor insects.

Table 2. Highest use compounds in the New Jersey 2023 Structural Pesticide Use Survey.

Compound	Total (lbs. a.i.)	% of Total Usage
Insecticides		
Borate compounds	17,056	36
Bifenthrin	5,221	11
Fipronil	4,860	10
Dinotefuran	2,419	5
Imidacloprid	2,177	5

Table 3 shows the type of pests and locations receiving applications during the 2023 survey period. Approximately 55% of the total structural pesticide usage is accounted for by indoor general pest control. Since 2011, general indoor pest control accounts for almost half of the total structural use in New Jersey during each survey period.

Table 3. Use totals by type of pest/location in the New Jersey 2023 Structural Use Survey.

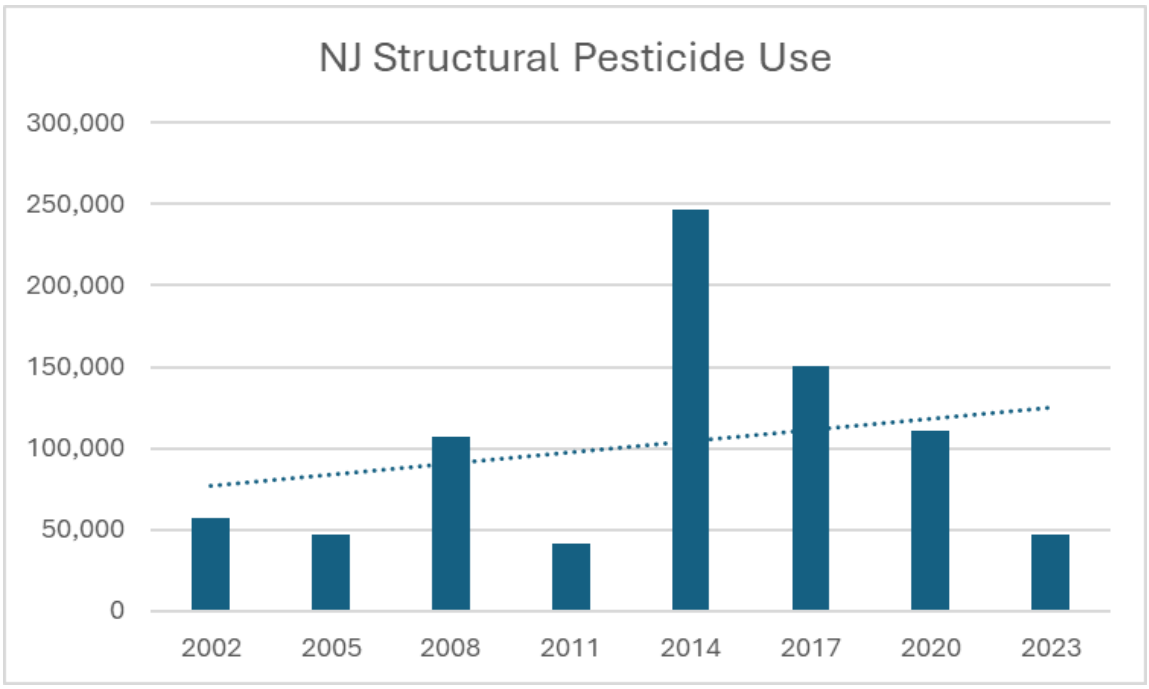
Pest Type	Total (lbs. a.i.)	% of Total Usage
General Insect Pests-Indoors	25,904	55
General Insect Pests-Outdoors	13,430	29
Termites	7,280	16
Vertebrates (mice, bats, etc.)	213	<1

Table 4 shows structural pesticide use by county. Passaic County had the highest use overall use, with a reported increase from 831 lbs. a.i. in 2020 to 8,479 lbs. a.i. in 2023. Structural pesticide use in Mercer County decreased by approximately 98% from 2020 (31,875 lbs. a.i. in 2020 to 735 lbs. a.i. in 2023). It should be noted that county totals for structural pesticide use are approximate since many companies work in two or more counties and they do not report a total for each county, just total use over all their application sites. PEMS requests they identify which county received most of their applications and that is the information entered into the database.

Table 4. Total pesticide amounts (lbs. a.i.) by county in the New Jersey 2023 Structural Use Survey.

County	Amount (lbs. a.i.)	% of Total
Atlantic	1265	3
Bergen	3947	8
Burlington	1430	3
Camden	1283	3
Cape May	307	1
Cumberland	124	<1
Essex	4674	10
Gloucester	6294	13
Hudson	816	2
Hunterdon	8	<1
Mercer	735	2
Middlesex	1202	3
Monmouth	5374	11
Morris	1252	3
Ocean	3004	6
Passaic	8479	18
Salem	187	<1
Somerset	3929	8
Sussex	138	<1
Union	1865	4
Warren	514	1

Figure 1 shows the total lbs. a.i. used in New Jersey for each structural use survey conducted. The reported pesticide usage for structural pest control decreased by approximately 42% between 2020 and 2023.


NJ Structural Pesticide Use
300,000
250,000
200,000
150,000
100,000
50,000
0
2002
2005
2008
2011
2014
2017
2020
2023