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



## STRUCTURAL PESTICIDE USE IN NEW JERSEY: 2020 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 seventh survey completed in the structural use series (2020).

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 Control, Licensing and Registration's records were used to identify all 3,417 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 and return envelopes asking for only 2020 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 2021.

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, 2,305 out of 3,417 (67%) applicators had responded. This response rate is the lowest since the first survey in 2002. Many surveys are being returned because applicators are not keeping their mailing address current with the Bureau of Licensing and Registration. PEMS will forward "returned to sender" surveys and a list of non-responders to the Bureau of Pesticide Control, Licensing and Registration for follow-up.

Pesticides used by the structural pest control industry in New Jersey for 2020 totaled 110,338 lbs. a.i. Table 1 lists all the compounds reported in the 2020 survey and the amounts (lbs. a.i.) applied. Insecticides comprise 79% of the total pesticide use in the New Jersey structural pest control industry. Fumigants account for 12% of the total. Herbicides, growth regulators, rodenticides, avicides, fungicides and miscellaneous chemicals comprise the remaining 9% of pesticides applied for structural pest control.

INSECTICIDES	lbs. a.i.	INSECTICIDES	lbs. a.i.
Abamectin	1	Fluvalinate	2
Acephate	227	Gamma-cyhalothrin	93
Acetamiprid	2,922	Hydramethylnon	9
Alpha-cypermethrin*	413	S-Hydropene	520
Beta-cyfluthrin	3,060	Imidacloprid	6,393
BMP 144*	11	Indoxacarb	1,017
Bifenthrin	15,836	Isopropyl alcohol*	6,364
Borate compounds	10,148	Lambda-cyhalothrin	1,907
Propoxur*	3	Linalool*	1
Carbaryl	5	Methomyl	2
Chlorantraniliprole	4	Metofluthrin	10
Chlorfenapyr	2,109	MGK 264	698
Clothianidin	293	Naphthalene	49
Cyfluthrin	740	Oil*	6
Cypermethrin	516	Permethrin	509
DDVP (Dichlorvos)	461	Phenothrin	79
Deltamethrin	3,356	Prallethrin	252
Diatomaceous earth	500	Pyrethrins	961
Diflubenzuron*	1	Silicon dioxide	1,227
Dinotefuran	3,997	Silica gel	267
Esfenvalerate	816	Tetramethrin	4
Etofenprox	198	Thiamethoxam	402
Fipronil	20,557	<b>Insecticides Total</b>	86,946

**Table 1**. Pesticide amounts (lbs. a.i.) reported in the New Jersey 2020 StructuralPesticide Use Survey. \*Indicates a compound not reported in the 2017 survey.

HERBICIDES	lbs. a.i.	MISCELLANEOUS	lbs. a.i.
2,4-D	4	Ammonium chloride	111
2,4-DP	2	Beauveria bassiana strain GHA*	2
Dicamba	1	Chlorine dioxide*	8
Diquat*	3	DDAC*	46
Glyphosate	110	Hydrogen peroxide*	21
Indaziflam*	52	Phermones*	39
Prodiamine*	7	Piperonyl butoxide	5,294
Herbicides Total	179	Propionic acid*	7
		Sulfur	195
GROWTH REGULATORS	lbs. a.i.	Miscellaneous Total	5723
Novaluron	82	AVICIDES	lbs. a.i.
Noviflumuron*	68		
Pyriproxyfen	402	Anthraquinone	58
S-Methoprene	157	Methyl athranilate	3,231
		Polybutene	41
<b>Growth Regulators Total</b>	709	Avicides Total	3,330
RODENTICIDES	lbs. a.i.	FUMIGANTS	lbs. a.i.
Brodifacoum	1	Magnesium phosphide	2
Bromadiolone	7	Methyl bromide	544
Chlorophacinone	1	Sulfuryl fluoride	12,791
Difethialone	1	Fumigants Total	13,337
Diphacinone	2		
Vitamin D3	1		
Zinc phosphide	101		
<b>Rodenticides Total</b>	114		

**Table 1. (cont.)**Pesticide amounts (lbs. a.i.) reported in the New Jersey 2020 StructuralPesticide Use Survey. \*Indicates a compound not reported in the 2017 survey.

Table 2 lists the highest use compounds in the two main structural use pesticide categories (lbs. a.i.) as listed in Table 1. The most highly reported pesticide used in structural pest control was the insecticide fipronil. This insecticide accounted for approximately 19% of the total pesticides applied for structural pest control in New Jersey in 2020. Fipronil is a broad-spectrum phenylpyrazole insecticide that has been registered for use in the United States since 1996. It is a white powder with a moldy odor that targets ants, beetles, cockroaches, fleas, ticks and other

insects. The second most heavily used pest control chemical is the insecticide bifenthrin (14% of NJ total). Bifenthrin is a synthetic pyrethroid insecticide that has been registered in the United States since 1985. Bifenthrin products include aerosols, granules and sprays and targets indoor and outdoor insects.

Compound	Total (lbs. a.i.)	% of Total Usage
Insecticides		
Fipronil	20,557	19
Bifenthrin	15,839	14
Borate compounds	10,148	9
Fumigant		
Sulfuryl fluoride	12,791	12

**Table 2**. Highest use compounds in the New Jersey 2020 Structural Pesticide Use Survey.

Table 3 shows the type of pests and locations receiving applications during the 2020 survey period. Approximately 53% of the total structural pesticide usage is accounted for by indoor general pest control. This percentage could be higher, however, because over 18,000 lbs. a.i. (approximately 16% of the total reported use) were not assigned a pest code on the survey form. 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 2020 Structural Use Survey.

Pest Type	Total (lbs. a.i.)	% of Total Usage
General Insect Pests-Indoors	58,053	53
General Insect Pests-Outdoors	24,064	22
Termites	6,772	6
Vertebrates (mice, bats, etc.)	3,340	3
Other/No Pest Code Listed	18,109	16

Table 4 shows structural pesticide use by county. Mercer County had the highest use overall use, with an increase from 2,119 lbs. a.i. in 2017 to 31,875 lbs. a.i. in 2020. Structural pesticide use in Camden County decreased by over 90% from 2017 (50,902 lbs. a.i. in 2017 to 4,494 lbs. a.i. in 2020). 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.

	Amount	% of
County	(lbs. a.i.)	Total
Atlantic	670	1
Bergen	13,942	13
Burlington	839	1
	4 407	4
Camden	4,487	4
Cape May	723	1
Cumberland	372	<1
Essex	7.829	7
Gloucester	5.007	5
Hudson	5,067	5
Hunterdon	35	<1
Mercer	31,875	29
Middlesex	940	1
Monmouth	0 760	0
Momia	1,207	9
Morris	1,387	1
Ocean	3,780	3
Passaic	831	1
Salem	828	1
Somerset	12,966	12
Sussey	360	~1
Union	6 376	<1 6
Warnan	0,520	0
w arren	2,302	2

**Table 4**. Total pesticide amounts (lbs a.i.) by county in the New Jersey 2020 Structural Use Survey.

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 26% between 2017 and 2020.

**Figure 1.** Total lbs. a.i. used in New Jersey for each structural use survey conducted (2002-2020).



An reported increase of more than 60,000 lbs. a.i. of fumigants is the largest contribution to the rise in use seen between 2011 and 2014. Since 2014, the overall trend shows a decrease in overall reported use. However, there has not been a decrease in the number of respondents that might account for the decrease in total reported use. In fact, the number of respondents has only decreased by approximately 100 between 2014 and 2020 (3,519 in 2014, 3,495 in 2017 and 3,417 in 2020). Perhaps Integrated Pest Management practices, including prevention, biological, mechanical and cultural controls, have lead to a decrease in the need for chemicals to control structural pests.