NJ Department of Environmental Protection
Division of Compliance Operations and Coordination
Pesticide Evaluation and Monitoring Section

RIGHT-OF-WAY PESTICIDE USE IN NEW JERSEY: 2018 SURVEY

Introduction

The Pesticide Evaluation & Monitoring Section (PEMS) began a series of pesticide use surveys in 1985. These surveys address pesticide use by licensed applicators in the state of New Jersey for agriculture, golf courses, termite control, right-of-way, mosquito control, and lawn care. The right-of-way use survey is conducted every three years and targets pesticides used for right-of-way pest control purposes. A right-of-way is a land easement reserved for transportation purposes including highways, public footpaths, rail transport and canals, as well as electrical transmission, oil and gas pipelines. This report focuses on the eighth survey completed in the right-of-way use series (2018).

All statewide pesticide use surveys are performed under the authority of the New Jersey Pesticide Control Code (NJPCP), N.J.A.C. 7:30-1 et.seq., 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. In fact, these New Jersey surveys could represent a pesticide usage census rather than a probabilistic survey.

The information collected from the PEMS pesticide use surveys is used by programs 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 Licensing and Registration's records were used to identify 791 licensed commercial applicators holding a 6B (right-of-way) category on his or her license. Survey forms were mailed along with instructional letters and return envelopes asking for only 2018 right-of-way pesticide use. A total of three mailings were sent during the first four months of 2018.

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

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, 658 out of 791 (83%) applicators responded. Response rates have been steadily declining since the first survey in 1992. Many surveys were returned because applicators are not keeping their mailing address current with the Bureau of Licensing and Registration. PEMS forwarded "returned to sender" surveys to the Bureau of Licensing and Registration for follow-up. PEMS also forwarded a list of non-responders to the Bureau of Compliance for follow-up.

Pesticides used by the right-of-way pest control industry in New Jersey for 2018 totaled 68,009 lbs. a.i. This is a 12,313 lbs. a.i. increase from the reported use in 2015. Table 1 lists all the compounds reported in the 2018 survey and the amounts (lbs. a.i.) applied. All of the pesticides reported as used for right-of-way vegetation control in 2018 were herbicides, with the exception of one fungicide. Only 1 lb. a.i. of the fungicide flumioxazin was reported in 2018.

Table 1. Pesticide amounts (lbs. a.i.) reported in the New Jersey 2018 Right-Of-Way Pesticide Use Survey.

COMPOUND	lbs. a.i.	COMPOUND	lbs. a.i.
2,4-D	16,568	Isoxaben	2
2,4-DP	4	Mecoprop	42
Aminocyclopyrachlor	490	Metolachlor	76
Aminopyralid	606	Metsulfuron	279
Bromacil*	14	Metsulfuron-methyl	752
Chlorsulfuron	31	Oryzalin	51
Dicamba	935	Oxyfluorfen*	606
Dichlobenil*	2	Paraquat*	3
Diquat	217	Pendimethalin	313
Dithiopyr	4,204	Penoxsulam*	12
Diuron	607	Picloram	155
Flumioxazin*^ (fungicide)	1	Prodiamine	180
Fenoxaprop-ethyl	21	Prometon	5
Glufosinate-ammonium	15	Quinclorac*	1
Glyphosate	36,690	Sulfentrazone*	1
Halosulfuron-methyl*	1	Sulfometuron	656
Hexazinone*	149	Tebuthiuron	2
Imazapyr	1,633	Topramezone*	1
Imazapic	9	Triclopyr	2,358
Imazapic-ammonium	10	Trifluralin	4
Indaziflam	303	**TOTAL:**	**68,009**

*Indicates a compound not reported in the 2015 survey.
^All compounds listed are herbicides, with the exception of the fungicide flumioxazin.

Table 2 lists the highest use compounds reported in the 2018 right-of-way survey. The most highly reported pesticide used in right-of-way vegetation control was the herbicide glyphosate. This herbicide accounted for 54% of the total pesticides applied for right-of-way vegetation control in New Jersey in 2018. Glyphosate is a broad spectrum, systemic herbicide. It is most widely used to control annual broad-leaf weeds. According to the 2018 survey data, 23,242 of the 36,690 lbs. a.i. (63%) of the glyphosate used in right-of-way vegetation control in New Jersey was applied to public roads and railways.

The second most heavily used right-of-way herbicide is 2,4-D (24% of NJ total). 2,4-D is a systemic, selective herbicide that kills broadleaf weeds by causing uncontrolled cell growth. Ninety-five percent (15,756 lbs. a.i.) of the 2,4-D reported in the 2018 survey was applied to railways.

Table 2. Highest use compounds in the New Jersey 2018 Right-Of-Way Pesticide Use Survey.

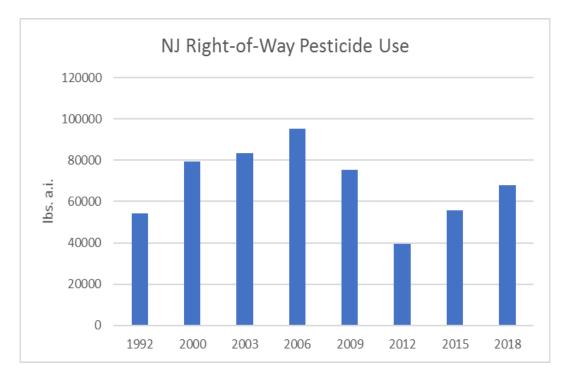| Compound	Total (lbs. a.i.)	% of Total Usage
Glyphosate	36,690	54
2,4-D	16,568	24
Dithiopyr	4,204	6
Triclopyr	2,358	3
Imazapyr	1,633	2

Table 3 shows the sites receiving right-of-way applications during the 2018 survey period. Nearly half of the reported herbicide applications occurred on railways in NJ in 2018. This is an increase from the previous right-of-way survey; only 12% of the reported use occurred on railways in 2015. The second most heavily treated right-of-way site in 2018 was public roads. However, herbicides applied to public roads decreased from 24,363 lbs. a.i. in 2015 to 14,008 lbs. a.i. in 2018.

Table 3. Use totals by application site in the New Jersey 2018 Right-Of-Way Use Survey.

Site	Total (lbs. a.i.)	% of Total Usage
Railways	29,272	43
Public Roads	14,008	21
Powerlines	7,773	11
Other	5,455	8
Building Perimeters/Fence Lines	4,397	6
Substations	3,615	5
Pipelines	3,489	5

Figure 1 shows the total lbs. a.i. used in New Jersey for each right-of-way use survey conducted. The reported pesticide usage for right-of-way vegetation control peaked in 2006, then decreased by approximately 40,000 lb. a.i. in 2012. Reported right-of-way use increased during the following two reporting years.

Figure 1. Total lbs. a.i. used in New Jersey for each right-of-way use survey conducted (1992-2018).

Summary & Conclusions

Between 2000 and 2015, reported right-of-way glyphosate use has averaged approximately 36,000 lbs. a.i. per survey year and reported right-of-way 2,4-D use has averaged approximately 1,800 lbs. a.i. per survey year. In 2018, reported glyphosate use was 36,690 lbs. a.i. However, reported 2,4-D use was 16,568 lbs. a.i. Glyphosate use did not deviate from its 15-year average, while 2,4-D use was 10 times higher in 2018. Since its registration in 1974, glyphosate has become the most commonly used herbicide worldwide, leading to glyphosate resistance among many types of weeds. As a result, 2,4-D is often tank mixed with glyphosate to combat glyphosate-resistance. An increase of glyphosate-resistant weeds along New Jersey's right-of-ways might explain the increase in reported 2,4-D use in 2018.

The number of licensed applicators holding a category 6B (right-of-way) on their license has steadily increased from 326 in 1992 to 658 in 2018. While the survey response rate has steadily decreased during the same period, the actual number of licensed applicators responding to the survey has increased. An increase in the actual number of applicators responding to the survey does not necessarily indicate an increase in reported use. Many applicators hold a category on their license and never make an application under that category. In the future, PEMS will log reported use/not reported use when survey responses are recorded to be able to better measure the relationship between total lbs. a.i. applied and the number of licensed applicators reporting use.