

MOSQUITO CONTROL PESTICIDE USE IN NEW JERSEY – 2016

Introduction

The NJDEP Office of Pesticide & Evaluation Monitoring (OPEM) 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 specific purpose of the 2016 Mosquito Control survey was to identify what chemicals and what quantities of each chemical were used in 2016 for mosquito control. There is a general interest in the trends of mosquito control chemicals, due mainly to their use as disease vector controls and their application in environmentally sensitive areas.

Survey Methods

Three mailings were sent out over the course of six months to County mosquito control commissions and individuals carrying an 8B (mosquito control) or 8C (campground applicator) category code on his or her pesticide applicator license. Survey forms, along with instructional letters and a return envelope, were mailed to these agencies or individuals requesting information on the pesticides they used during 2016 for mosquito control. A survey mailing list was kept in the office. As surveys were received, the mosquito control applicators were marked off the list. Second and third mailings were made to non-respondents indicating that the previously mailed survey had not been received.

Survey information was entered into a database file upon receipt. 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 pounds of active ingredient (lbs. ai.).

Results & Discussion

Once all three mailings were completed, 637 out of 794 (80%) applicators had responded to the survey. Based on the data submitted, pesticides used for mosquito control in New Jersey for 2016 totaled 36,795 lbs. ai.

Overall mosquito control pesticide used decreased slightly from 2013 (40,054 lbs. ai.) to 2016 (36,795 lbs. ai.). This decrease could be attributed to the 10% reduction from 2013 to 2016 in the number of applicators who responded to the survey.

Table 1 lists the chemicals and their amounts in lbs. ai. reported in the 2016 survey. The trade names corresponding with these chemicals are also included. *Bacillus thuringiensis* (BTI) and oil account for over 50% of the mosquito control products used in New Jersey. BTI and oil both control mosquitoes at the larval stage. BTI is a naturally occurring bacterium found in soils. BTI

spores produce toxins that are lethal to only mosquito larvae. Oil is dispersed as a thin layer over the surface of the water to drown the larvae. It should be noted there was a 6,713 lbs. ai. reduction in the use of oil between 2013 and 2016. This can perhaps be explained in part by the 1,746 lbs. ai. increase in the use of methoprene, another larvicide, from 2013 to 2016.

Table 2 lists the chemicals and their lbs. ai. amounts applied by county for 2016. The coastal counties of Atlantic, Monmouth and Ocean each showed at least a 50% increase in their use of mosquito control pesticides. Pest pressures, weather and budget allotments can influence the amount of pesticides applied in any given year.

Table 3 lists the chemicals and their lbs ai amounts applied by site for 2016. Over 75% of mosquito control in New Jersey occurs in residential and commercial areas and wetlands (coastal and non-coastal). While the amount of chemicals applied for mosquito control in NJ is minor compared to the chemicals used in agriculture (1,111,050 lbs. ai. based on the 2015 Private Applicator Survey), mosquito control chemicals are applied in residential and commercial areas (business/office parks) near people. The majority of mosquito control chemicals (over 50% in 2016) are applied to environmentally sensitive wetlands. Monitoring use trends is important to mitigate risks to human health and the environment in both areas.

Figure 1 shows the total lbs. ai. used in New Jersey for each mosquito use survey conducted. The outbreak of West Nile virus in 1999 could account, in part, for the peak in usage in 2001. There has been a steady decline in the total pounds applied since that peak in 2001. A possible factor in this steady decline is the adoption of Integrated Pest Management (IPM). IPM is an environmentally sensitive and cost-effective approach to pest control, utilizing insect life cycle monitoring and current pest control methods to minimize pest damage with the least possible risk to people, property and the environment. When applied to mosquito control, IPM aims to reduce and eliminate breeding grounds for mosquitoes. Many species of mosquitoes need standing water to breed. Removing the sources of standing water in residential/commercial areas (flower pots, trash containers, bird baths, toys, etc.) can reduce the amount of chemicals needed to control the pests.

Table 1. Compounds appearing in the 2016 Mosquito Control Pesticide Use Survey and their amounts (lbs. ai.). Not all brand names are listed, only the most popular according to the survey.

*Indicates a compound that was not reported in the previous survey.

Chemical	Brand Name	Amount (lbs. a.i.)	% of Total
Bifenthrin	Talstar, Bifen IT	942	3
Bacillus sphaericus	Fourstar, Vectolex	724	2
Bacillus thuringensis	Aquabac, Vectobac	12,297	33
Borate*	Niban	1	0
Cyfluthrin	Cykick, Optashield	302	1
Cyhalothrin	Demand	772	2
Deltamethrin	Suspend	40	0
Etofenprox	Zenivex	301	1
Fipronil*	Termidor	44	0
Fluvalinate	Mavrik	5	0
Hydropene*	Gentrol	8	0
Isooctadecanol	Agnique	82	0
Malathion	Fyfanon	1,600	4
Methoprene	Altosid	1,957	5
Oil	Bonide, Golden Bear, BVA 2	8,684	24
Permethrin	Aqua Reslin, Permacap	116	0
Phenothrin	Duet	114	0
Piperonyl butoxide	(synergist)	3,873	11
Prallethrin	Duet	18	0
Pyriproxyfen	Nyguard	5	0
Resmethrin	Scourge	1,058	3
Spinosad	Natular	36	0
Sulfosulfuron*	Maverick	2	0
Temephos	Abate, Provect	3,814	10
Total:		36,795	100%

Table 2. Pesticide amounts (lbs. ai.) in the 2016 Mosquito Control Pesticide Use survey by county.

County	Amount (lbs. a.i.)	% of Total
Atlantic	8,851	24
Bergen	612	2
Burlington	948	3
Camden	941	3
Cape May	5,335	14
Cumberland	254	1
Essex	285	1
Gloucester	1,896	5
Hudson	55	<1
Hunterdon	15	<1
Mercer	401	1
Middlesex	2,867	8
Monmouth	2,835	8
Morris	1,180	3
Ocean	7,900	21
Passaic	259	<1
Salem	483	1
Somerset	321	1
Sussex	393	1
Union	699	2
Warren	265	1
Total:	36,795	100%

Table 3. Pesticide amounts (lbs. ai.) in the 2016 Mosquito Control Pesticide Use survey by site.

Site	Amount (lbs. a.i.)	% of Total
Residential, commercial	9,193	25
Parks, campgrounds	983	3
Golf courses	257	<1
Catch basins, ditches	4,977	14
Coastal wetlands	10,238	28
Non-coastal wetlands	9,328	25
Lakes, ponds	22	<1
Other, no code	1,797	5
Total:	36,795	100%

“Other” sites include tires and other artificial containers, retention basins, sewage treatment plants, woodland pools, flood water and abandoned swimming pools.

Figure 1. Pesticide amounts (total lbs. ai.) used in New Jersey for each survey conducted.

