NJ Pesticide Control Program
Pesticide Control Program
Pesticide Evaluation & Monitoring

AGRICULTURAL PESTICIDE USE IN NEW JERSEY: 2012 SURVEY

Introduction

The New Jersey Pesticide Control Program (NJPCP) 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 agricultural use survey is conducted every three years and targets agricultural, nursery, and greenhouse use of general and restricted pesticides. This report focuses on the tenth survey completed in this series (2012).

All statewide pesticide use surveys are performed under the authority of the New Jersey Pesticide Control Code, N.J.A.C. 7:30-1 et.seq., requiring applicators to maintain pesticide records for two 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 almost represent a pesticide usage census rather than a probabilistic survey.

The information collected from the NJPCP 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. The survey data are also entered into state and federal geographical information systems for geographical distribution.

Methods

The NJPCP's registration records were used to identify all 1703 private applicators licensed as of December 2012. "Private applicators" (persons using pesticides on agricultural commodities) include farmers, ranchers, sod farmers, Christmas tree growers, and nursery and greenhouse operators. A survey form was sent to each applicator, but since two or three applicators can work on the same agricultural establishment, the accompanying cover letter requested that only one form be returned for each agricultural establishment to avoid duplication of response. A total of three mailings were sent during the first seven months of 2013.

The survey requested information on each pesticide product used. This included trade name, EPA registration number, percent active ingredient, amount applied, number of acres treated, and type of crop treated.

Survey information was entered into a database file. This information file was then merged with a

second database that linked chemical names with trade names, and a subprogram converted total amounts of formulated product to total amounts of active ingredient (lbs ai.).

Results

Overall, 86% (1459 of 1703) of the applicators responded to the survey. The list of non-respondents was turned over to the Bureau of Pesticide Compliance section for follow-up. Table I lists the chemicals and their amounts reported in the 2012 survey. Total New Jersey agricultural pesticide use for 2012 according to the survey was 978247 pounds active ingredient.

Table II lists the most frequently used compounds by pesticide category and overall. The single most used compound in 2012 was the herbicide glyphosate which made up 13.5% of the state's total agricultural pesticide use. Sulfur was second with 9.4% of the state's total use.

Table III lists the amounts and percentages of agricultural pesticide use on each crop type. Field corn and blueberries received the highest percentage of the total reported pesticide use.

Table IV lists by county the amounts and percentages of the state's total pesticide use. The southern half of New Jersey makes up most of the state's agricultural production. Atlantic, Burlington, Cumberland, Gloucester and Salem counties, all located in the south, showed the highest pesticide use. Warren, the strongest agricultural county in the north, displayed a moderate use. The heavily industrialized northern counties such as Bergen, Essex, Hudson and Union showed an expected small usage.

Discussion

Any review or discussion of the data collected in the 2012 agricultural pesticide use survey must focus on the uniqueness of New Jersey's agriculture. A primary point to consider is the absence of a particular major crop. Due to New Jersey's geographical location, climatic conditions allow the production of a tremendous selection of vegetables and fruits, and the state incorporates a vast collection of what are termed "truck farms", where a variety of small crops are grown on the same farm. Therefore, although individual pesticides may dominate use on a particular crop, there is no group of pesticides that dominate use in the state. This is in contrast to many mid-western states, where corn herbicides represent the predominant use.

There are a few high yield crops within New Jersey. The main fruit and berry crops produced in the state are apples, peaches, blueberries and cranberries. The main vegetable crop grown in New Jersey is sweet corn and the main field crops are hay and soybeans. Despite its relatively small size, New Jersey was the nation's third largest producer of cranberries and fourth largest producer of blueberries, peaches and bell peppers in 2012 (NJDOA, 2012).

In reporting and evaluating pesticide use, it is important to consider the many, diverse influences on pesticide use. No single factor, or even set of factors, can completely account for fluctuations

in the amounts of pesticide active ingredients used from survey to survey. Weather conditions such as temperature and rainfall, in terms of duration, timing and amounts or degrees, influence pest pressure and the associated response. In agricultural settings, issues such as cropping patterns and the associated pest impacts vary from year to year. Economic factors play a significant role, ranging from crop demand to golf course playability to product and/or service cost. The changing face of land use also plays a part. While agricultural acreage has been declining, new home building starts and the associated lawns around those new homes have been increasing.

Another factor is the adoption of IPM (Integrated Pest Management). Short term, some pest control situations may require increased pesticide applications beyond the alternative means contained in an IPM program. Long term, however, IPM should result in overall pesticide use reduction. This may be confounded by the increased use of reduced-risk alternatives that may have higher application rates than the materials they replace.

References

New Jersey Department of Agricultural, 2012 Annual Report/Statistics. NJ Department of Agriculture, Trenton; 2012.

TABLE I. Pesticide amounts (lbs active ingredient) reported in the New Jersey 2012 Agricultural Pesticide Use Survey.

HERBICIDES:	
2,4-D	19358
2,4-DP	522
2,4-DT	21
Acetochlor	4819
Acifluorfen	107
Alachlor	1945
Aminopyralid	2
Ammonium sulfate	67
Atrazine	46490
Benfluralin	18
Bensulide	14595
Bentazon	593
Bromochlophos	4
Bromoxynil	20
Butylate	22
Carfentrazone-ethyl	11
Chlorimuron-ethyl	137
Chlorsulfuron	1
Chlorthal-dimethyl	10279
Clethodim	606
Clomazone	1601
Clopyralid	318
Cloransulam-methyl	88
Cycloate	1162
Dicamba	3387
Dichlobenil	1952
Diflufenzopyr	20
Dimethenamid	7299
Diquat	179
Dithiopyr	187
Diuron	9165
DSMA, MSMA	116
EPTC	167
Ethalfluralin	1950
Ethofumesate	2
Fenoxaprop-ethyl	51
Fluazifop-butyl	59
Flumetsulam	7
Flumiclorac-pentyl	28
Flumioxazin	1770
Fluroxpyr	10
Fluthiacet-methyl	76
Fomesafen sodium	139
Glufosinate-ammonium	2163
Glyphosate	131941
Halosulfuron-methyl	68
Hexazinone	190
Imazamox	7
Imazethapyr	112
Indaziflam	55
Isoxaben	663
Isoxaflutole	7
Lactofen	49
Linuron	2287
MCPA	74
Mecoprop	1424
Mesosulfuron-methyl	38
Mesotrione	2049
Metolachlor	19533
Metolachlor-S	37503
Metribuzin	2362
Metsulfuron-methyl	177
Napropamide	3820
Nicosulfuron	24
Norflurazon	10114
Oryzalin	6660
Oxadiazon	498
Oxyfluorfen	746
Paraquat	16452
Pelargonic acid	332
Pendimethalin	18260
Phenmedipham	605
Primisulfuron	5
Prodiamine	1286
Prometon	21
Prometryn	139
Pronamide	281
Pyroxsulam	1
Quinclorac	88
Quizalofop-ethyl	173
Rimsulfuron	98
Saflufenacil	261
Sethoxydim	483

Siduron	175
Simazine	3290
Sulfentrazone	380
Sulfometuron	1
Tembotrione	5
Terbacil	1620
Thiencarbazone-methyl	4
Thifensulfuron	511
Topramezone	1
Tribenuron	236
Triclopyr	51
Trifluralin	1359
TOTAL HERBICIDES:	**398032**

INSECTICIDES:

Abamectin	18
Acephate	3376
Acequinocyl	10
Acetamiprid	462
Azadirachtin (Neem)	41
Azinphos-methyl	981
Bifenazate	166
Bifenthrin	1631
Bacillus sp.	2656
C. subsuae	11
Carbaryl	12818
Carbofuran	9
Chlorantraniliprole	491
Chlorfenapyr	12
Chlorpyrifos	6646
Clofentezine	26
Clothianidin	42
Cyfluthrin	1151
Cyhalothrin	1168
Cypermethrin	283
Deltamethrin	<1
Diazinon	3984
Dicofol	18
Dimethoate	2360
Dinotefuran	167
Emamectin	1
Endosulfan	3276
Esfenvalerate	540
Etoxazole	3
Fenbutatin oxide	2004
Fenpropathrin	97
Fenpyroximate	150
Fipronil	86
Flonicamid	27
Flubendiamide	24
Fluvalinate	46
Formetanate HCL	11
Hexythiazox	40
Imidacloprid	3835
Indoxacarb	160
Limonene	37
Lindane	<1
Malathion	2839
Methidation	10
Methiocarb	76
Methomyl	10016
Methoxyfenozide	360
Mexacarbate	<1
Nicotine	1
Novaluron	36
Oil	56450
Oxamyl	3100
Oxydemeton-methyl	2
Permethrin	1025
Phorate	152
Phosmet	11863
Pymetrozine	99
Pyrethrins	4
Pyridaben	35
Pyridalyl	18
Soap	582
Sodium aluminofluoride	240
Spinetoram	594
Spinosad	233
Spirodiclofen	27
Spiromesifen	336
Spirotetramat	48
Tefluthrin	64
Terbufos	340
Thiacloprid	4
Thiamethoxam	875
Thiodicarb	69
Trichlorfon	30

TOTAL INSECTICIDES:	**138392**

FUNGICIDES:

Acibenzolar-methyl	12
Azoxystrobin	5039
Benomyl	6
Boscalid	1048
Buprofezin	<1
Calcium polysulfide	7
Captan	54867
Carboxin	1
Chlorothalonil	62617
Coniothyrium mintans	71
Copper salts	28966
Cyazofamid	745
Cymoxanil	562
Cyprodinil	1329
Difenoconazole	69
Dimethomorph	223
Dodine	785
Etridiazole	636
Famoxadone	441
Fenamidone	18
Fenarimol	12
Fenbuconazole	1385
Fenhexamid	396
Ferbam	550
Fludioxonil	300
Fluopicolide	445
Fluopyram	1
Fluoxastrobin	9
Fluxapyroxad	3
Flutolanil	25
Flutriafol	4
Fosetyl-al	694
Iprodione	1072
Kresoxim-methyl	195
Laminaran	2
Mancozeb/Mnb/Znb	37860
Mandipropamid	925
Mefenoxam	816
Metalaxyl	293
Metconazole	154
Metiram	594
Metrafenone	49
Myclobutanil	1043
Penthiopyrad	151
Phosphoric acid	331
Piperalin	1
Polyoxin D Zinc	58
Potassium Bicarbonate	507
Potassium Phosphite	24413
Propamocarb HCL	7364
Propiconazole	807
Prothioconazole	183
Pyraclostrobin	1270
Pyrimethanil	27
Quinoxyfen	154
Quintozene	562
Reynoutria sachalinensis	251
Sulfur	92356
Tebuconazole	490
Thiophanate-methyl	4797
Thiram	45
Triadimefon	114
Trichoderma harzianum	4
Trifloxystrobin	569
Triflumizole	203
Triforine	1
Ziram	31370
Zoxamide	37
TOTAL FUNGICIDES:	**370333**

RODENTICIDES:

Brodifacoum	<1
Bromadiolone	<1
Bromethalin	<1
Chlorophacinone	<1
Diphacinone	<1
Zinc Phosphide	15
TOTAL RODENTICIDES:	**15**

GROWTH REGULATORS:

Aminoethoxyvinylglycine	9
Ancymidol	<1
Benzyladenine	24
Chlormequat chloride	166
Cyromazine	100
Cytokinin	1
Daminozide	917
Diflubenzuron	7
Ethephon	382
Fenoxycarb	<1
Flurprimidol	<1
Gibberellin	71
Indole-3-butyric acid	2
Kinoprene	36
Methyl octanoate	158
NAA, NAD	13
Paclobutrazol	552
Prohexidione calcium	10
Pyriproxyfen	21
Trinexapac-ethyl	4
Uniconazole	1
TOTAL GRs:	**2474**

FUMIGANTS:

Aluminum Phosphide	13
Chloropicrin	3012
Dazomet	28
Dichloropropene	152
Metam-sodium	56770
Zinc Phosphide	13
TOTAL FUMIGANTS:	**59988**

BACTERICIDES:

Ammonium chloride	121
Hydrogen Peroxide	5919
Nitrapyrin	7
Oxytetracycline	784
Streptomycin	410
TOTAL BACTERICIDES:	**7241**

MISCELLANEOUS:

4-aminopyridine	<1
Capsaicin	<1
Iron phosphate	13
Kaolin	1501
Metaldehyde	91
Methyl anthranilate	4
Neem oil	2
OBD	1
Octadecadienol	9
Piperonyl butoxide	125
Sodium hypochlorite	1
Sodium percarbonate	28
TOTAL MISCELLANEOUS**:**	**1775**

TOTAL PESTICIDE USE: 978247

Herbicides:	41 %
Insecticides:	14 %
Fungicides:	38 %
Fumigants:	6 %
Other:	1 %

TABLE II. Highest use compounds in 2012 from the main pesticide categories. Shown are compounds >= 5% of class.

Compound	Lbs Active Ingredient	% of Class	% of Total Use
HERBICIDES:			
Glyphosate	131941	33.1 %	13.5 %
Atrazine	46490	11.6 %	4.7 %
Metolachlor-S	37503	9.4 %	3.8 %
Metolachlor	19533	5.0 %	2.0 %
INSECTICIDES:			
Oil	56450	40.7 %	5.7 %
Carbaryl	12818	9.2 %	1.3 %
Phosmet	11863	8.6 %	1.2 %
Methomyl	10016	7.2 %	1.0 %
FUNGICIDES:			
Sulfur	92356	24.9 %	9.4 %
Chlorothalonil	62617	16.9 %	6.4 %
Captan	54867	14.8 %	5.6 %
Mancozeb/Mnb/Znb	37860	10.2 %	3.9 %
Ziram	31370	8.4 %	3.2 %
Copper salts	28966	7.8 %	2.9 %
Potassium Phosphite	24413	6.6 %	2.5 %
FUMIGANTS:			
Metam-Sodium	56770	94.6 %	5.8 %

TABLE III. Total pesticide amounts (lbs. active ingredient) applied to crops in 2012.

CROP	AMOUNT	% of Total Pesticide Use
Apples	51704	5.3
Peaches	103827	10.6
Other Tree Fruit	26495	2.7
Blueberries	136926	14.0
Cranberries	24053	2.5
Strawberries	3869	0.4
Grapes	24714	2.5
Sweet Corn	16135	1.7
Field Corn	145774	14.9
Grains	7973	0.8
Soybeans	90793	9.3
Beans/Peas	3829	0.4
Asparagus	6027	0.6
Cucumbers	21943	2.2
Tomatoes	43408	4.4
Peppers	31068	3.2
Eggplants	10156	1.0
Potatoes	22017	2.3
Chinese Vegetables	14602	1.5
Cabbage	6114	0.6
Cauliflower	618	0.1
Broccoli	1298	0.1
Brussel Sprouts	122	0.0
Other Cole	2091	0.2
Lettuce	19146	2.0
Spinach	3853	0.4
Leafy Greens	8230	0.8
Other Leafy	15197	1.6
Hay/Alfalfa	7691	0.8
Sod	11023	1.1
Ornamentals	58866	6.0
Livestock	19	0.0
no code*	58638	6.0
ALL CROPS	978247	100.0

*no crop codes were indicated or commodity treated was not originally listed on survey. Frequently reported commodities not appearing on the list were pumpkins and root vegetables such as onions, carrots and radishes.

TABLE IV. Total pesticide amounts (lbs. active ingredient) applied by county in 2012.

COUNTY	Amount	Total Use
Atlantic	158136	16 %
Bergen	501	<1 %
Burlington	110885	11 %
Camden	6455	1 %
Cape May	7530	1 %
Cumberland	182784	19 %
Essex	0	0 %
Gloucester	122252	12 %
Hudson	0	0 %
Hunterdon	42585	4 %
Mercer	18922	2 %
Middlesex	17095	2 %
Monmouth	45753	6 %
Morris	18615	2 %
Ocean	11460	1 %
Passaic	1663	<1 %
Salem	138741	14 %
Somerset	9672	1 %
Sussex	8612	1 %
Union	20	<1 %
Warren	73668	7 %
Unspecified	2898	<1 %
TOTAL	978247	100

2012 Agricultural Pesticide Use by County