NJ Pesticide Control Program
Pesticide Control Program
Pesticide Evaluation & Monitoring

AGRICULTURAL PESTICIDE USE IN NEW JERSEY: 2003 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 seventh survey completed in this series (2003).

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 2094 private applicators licensed as of December 2003. "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 2004.

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, 87% (1827 of 2094) 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 2003 survey. Total New Jersey agricultural pesticide use for 2003 according to the survey was 1,110,972 pounds active ingredient.

Table II lists the most frequently used compounds by pesticide category and overall. The single most used compound in 2003 was sulfur which made up 12% of the state's total agricultural pesticide use. Metam-sodium was second with 10% of the state's total use.

Table III lists the amounts and percentages of agricultural pesticide use on each crop type. A few chemicals dominated certain crops. Peaches received the highest percentage (almost 22%) 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. Monmouth, located in central New Jersey, showed a moderate amount of pesticide use. Warren, the strongest agricultural county in the north, also 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 2003 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 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 second largest producer of blueberries, third largest producer of bell peppers, and fourth largest producer of cranberries and head lettuce in 2003 (NJDOA, 2004).

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, 2003 Annual Report/Statistics. NJ Department of Agriculture, Trenton; 2004.

TABLE I. Pesticide amounts (lbs active ingredient) reported in the New Jersey 2003 Agricultural Pesticide Use Survey.

HERBICIDES:

2,4-D	18603
2,4-DB	6
2,4-DP	120
Acetochlor	13281
Acifluorfen	20
Alachlor	7951
Atrazine	45152
Benfluralin	38
Bensulide	13052
Bentazone	1607
Bromoxynil	6
Butylate	107
Carfentrazone-ethyl	6
Chlorimuron-ethyl	145
Chlorpropham	225
Chlorthal-dimethyl	6074
Clethodim	512
Clomazone	2377
Clopyralid	157
Cloransulam-methyl	104
Cyanazine	430
Cycloate	793
Dicamba	4779
Dichlobenil	942
Diflufenzopyr	92
Dimethenamid	323
Diquat	3
Dithiopyr	<1
Diuron	7826
DSMA, MSMA	235
EPTC	408
Ethalfluralin	907
Fenoxaprop-ethyl	16
Fluazifop-butyl	46
Flumetsulam	46
Flumiclorac-pentyl	42
Flumioxazin	18
Fluthiacet-methyl	<1
Fomesafen	75
Glufosinate-ammonium	113
Glyphosate	66296
Glyphosate-trimesium	9440
Halosulfuron-methyl	39
Hexazinone	191
Imazamox	4
Imazapyr	188
Imazaquin	108
Imazethapyr	377
Isoxaben	810
Lactofen	7
Linuron	1787
MCPA	833
Mecoprop	1062
Mesotrione	210
Metolachlor	45656
Metolachlor-S	433
Metribuzin	2363
Metsulfuron-methyl	2
Napropamide	5624
Naptalam	357
Nicosulfuron	147
Norflurazon	13158
Oryzalin	5628
Oxadiazon	459
Oxyfluorfen	1664
Paraquat	13507
Pebulate	73
Pelargonic acid	1
Pendimethalin	11713
Phenmedipham	560
Primisulfuron	47
Prodiamine	659
Prometon	6
Pronamide	1336
Prosulfuron	12
Quinclorac	39
Rimsulfuron	174
Sethoxydim	595
Siduron	275
Simazine	7817

Sodium percarbonate	17
Sulfentrazone	683
Terbacil	4197
Thifensulfuron	184
Tribenuron-methyl	80
Triclopyr	139
Trifluralin	905
Trinexapac	1
TOTAL HERBICIDES:	326500

INSECTICIDES:

Abamectin	6
Acephate	9251
Acetamiprid	2
Amitraz	2
Avermectin	14
Azadirachtin (Neem)	20
Azinphos-methyl	12261
Bendiocarb	78
Bifenazate	31
Bifenthrin	534
Borate	65
Bt, Microbials	3948
Carbaryl	11100
Carbofuran	3301
Chlorfenapyr	3
Chlorpyrifos	8730
Chlorpyrifos-methyl	7
Clofentezine	19
Cyfluthrin	221
Cyhalothrin	927
Cypermethrin	276
Diazinon	10918
Dichlorvos	8
Dicofol	553
Dienochlor	1
Dimethoate	3899
Disulfoton	424
Emamectin	1
Endosulfan	4209
Ethion	<1
Ethoprop	4
Etoxazole	<1
Fenamiphos	241
Fenbutatin oxide	48
Fenpropathrin	420
Fenvalerate	516
Fipronil	79
Fluvalinate	99
Formetanate HCL	119
Halofenozide	136
Hexythiazox	41
Imidacloprid	3179
Indoxacarb	120
Lindane	53
Malathion	2585
Methamidophos	18
Methidation	463
Methiocarb	264
Methomyl	11848
Methoxyfenozide	273
Mexacarbate	<1
Naled	1
Nicotine	1
Novaluron	1
Oil	83608
Oxamyl	2776
Oxydemeton-methyl	123
Parathion-methyl	16
Permethrin	879
Phorate	152
Phosmet	16615
Pymetrozine	41
Pyrethrins	2
Pyridaben	106
Rotenone	2
Soap	170
Sodium Aluminofluoride	240
Spinosad	1683
Tebufenozide	331
Tefluthrin	1137
Terbufos	9188
Thiamethoxam	113
Thiodicarb	116
Toxaphene	16
Trichlorfon	1455
TOTAL INSECTICIDES:	210087

FUNGICIDES:

Azoxystrobin	2961
Benomyl	925
Captan	81191
Carboxin	23
Chlorothalonil	57634
Cinnamaldehyde	1
Copper salts	28327
Cymoxanil	96
Cyprodinil	777
Dazomet	19
Dicloran	27
Dimethomorph	605
Dodine	275
Etridiazole	478
Fenaminosulf	<1
Fenarimol	85
Fenbuconazole	517
Fenhexamid	367
Ferbam	6131
Fludioxonil	861
Flutolanil	62
Fosetyl-al	3310
Iprodione	1873
Kresoxim-methyl	103
Mancozeb/Mnb/Znb	45461
Mefenoxam	3481
Metalaxyl	380
Metiram	2028
Myclobutanil	1001
Oxythioquinox	<1
Piperalin	3
Propamocarb HCL	418
Propiconazole	995
Pyraclostrobin	206
Quintozene	6764
Sulfur	138447
Tebuconazole	44
Thiophanate	6714
Thiophanate-methyl	1623
Thiram	131
Triadimefon	209
Trifloxystrobin	387
Triflumizole	34
Vinclozolin	247
Ziram	47828
Zoxamide	94
TOTAL FUNGICIDES:	443143

RODENTICIDES:

Bromadiolone	<1
Diphacinone	<1
Zinc Phosphide	13
TOTAL RODENTICIDES:	13

GROWTH REGULATORS:

Aminoethoxyvinylglycine	5
Chlormequat chloride	133
Cyromazine	84
Cytokinin	<1
Daminozide	3390
Diflubenzuron	66
Ethephon	278
Fenoxycarb	1
Gibberellic acid	24
IBA	<1
Kinoprene	96
Methyl octanoate	422
NAA, NAD	41
Paclobutrazol	32
Prohexidione calcium	1
Pyriproxyfen	17
Uniconazole	1
TOTAL GR REGULATORS:	4591

FUMIGANTS:

Aluminum Phosphide	1677
Chloropicrin	495
Metam-sodium	110166
Methyl bromide	3319
Sulfotep	1
TOTAL FUMIGANTS:	115658

BACTERICIDES:

Ammonium chloride	315
Ammonium nitrate	1980
Oxatetracycline	997
Streptomycin	215
TOTAL BACTERICIDES:	3507

MISCELLANEOUS:

Castor Oil	3
Harpin Protein	5
Hydrogen Peroxide	2654
Magnesium Sulfate	650
Metaldehyde	16
Piperonyl butoxide	4
Potassium salts	4140
Pheromone	1
TOTAL MISCELLANEOUS:	7473

TOTAL PESTICIDE USE: 1110972

Herbicides:	29%
Insecticides:	19%
Fungicides:	40%
Fumigants:	10%
Other:	2%

TABLE II. Highest use compounds in 2003 from the main pesticide categories. Shown are compounds >= 5% of class.

Compound	Lbs active ingredient	% of class	% of total use
HERBICIDES:			
Glyphosate	66296	20%	6%
Metolachlor	45656	14%	4%
Atrazine	45152	14%	4%
2,4-D	29137	9%	3%
INSECTICIDES:			
Oil	83608	40%	8%
Phosmet	16615	8%	2%
Azinphos-methyl	12261	6%	1%
Methomyl	11848	6%	1%
Carbaryl	11100	5%	1%
FUNGICIDES:			
Sulfur	138447	31%	12%
Captan	81191	18%	7%
Chlorothalonil	57634	13%	5%
Ziram	47828	11%	4%
Mancozeb	33504	8%	3%
Copper Salts	20666	5%	2%
FUMIGANTS:			
Metam-Sodium	110166	95%	10%

TABLE III. Total pesticide amounts (in pounds active ingredient) applied to crops in 2003.

CROP	AMOUNT	% of Total Pesticide Use
Apples	67885	6.1
Peaches	238305	21.5
Other Tree Fruit	13810	1.2
Blueberries	131262	11.8
Cranberries	34471	3.1
Strawberries	5243	0.5
Grapes	2917	0.2
Sweet Corn	20473	1.8
Field Corn	116435	10.5
Grains	4685	0.4
Soybeans	67893	6.1
Beans/Peas	9089	0.8
Asparagus	3371	0.3
Cucumbers	22029	2.0
Tomatoes	43374	3.9
Peppers	31749	2.9
Eggplants	13558	1.2
Potatoes	14957	1.3
Chinese Vegetables	15331	1.4
Cabbage	11232	1.0
Cauliflower	285	0.0
Broccoli	3021	0.3
Brussel Sprouts	51	0.0
Other Cole	2236	0.2
Lettuce	7597	0.7
Spinach	4560	0.4
Leafy Greens	7250	0.7
Other Leafy	5085	0.5
Hay/Alfalfa	7219	0.7
Sod	17324	1.6
Ornamentals	107145	9.6
Livestock	20	0.0
no code*	81110	7.3
ALL CROPS	1110972	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 root vegetables such as onions, carrots and radishes.

TABLE IV. Total pesticide amounts (lbs active ingredient) applied by county in 2003.

COUNTY	Amount	% Total Use
Atlantic	196544	18%
Bergen	2089	<1%
Burlington	108314	10%
Camden	10473	1%
Cape May	1688	<1%
Cumberland	229150	21%
Essex	157	<1%
Gloucester	255188	23%
Hudson	0	<1%
Hunterdon	34826	3%
Mercer	19317	2%
Middlesex	17948	2%
Monmouth	32582	3%
Morris	8787	1%
Ocean	14614	1%
Passaic	723	<1%
Salem	104854	9%
Somerset	7986	1%
Sussex	10056	1%
Union	90	<1%
Warren	55586	5%
TOTAL	1110972	100%