NJ Pesticide Control Program
Pesticide Control Program
Pesticide Evaluation & Monitoring

AGRICULTURAL PESTICIDE USE IN NEW JERSEY: 1997 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 fifth survey completed in this series (1997).

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 2442 licensed private applicators. "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 1998.

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, 94% of the applicators responded to the survey. Table I lists the chemicals and their amounts reported in the 1997 survey. Total New Jersey agricultural pesticide use for 1997 according to the survey was 1,432,006 pounds active ingredient.

Table II lists the most frequently used compounds by pesticide category. The single most used compound in 1997 was sulfur, which made up 16% of the state's total agricultural pesticide use. Metam-sodium followed with 15% 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 (21%) of the total agricultural 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 county, located in central New Jersey, showed a moderate amount of pesticide use. Warren county, 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 1997 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 four 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 grown are soybeans and hay. Despite its relatively small size, New Jersey was the nation's second largest producer of blueberries and peaches, third largest producer of cranberries and bell peppers, and fifth largest producer of head lettuce in 1997 (NJDOA, 1997).

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, 1997 Annual Report/Statistics. NJ Department of Agriculture, Trenton; 1997.

TABLE I. Pesticide amounts (lbs active ingredient) reported in the New Jersey 1997 Agricultural Pesticide Use Survey.

HERBICIDES:	
2,4-D	14635
2,4-DP	5
Acetochlor	46171
Acifluorfen	2688
Alachlor	30143
Atrazine	45700
Benfluralin	28
Bensulide	13282
Bentazone	3244
Bromacil	<1
Bromoxynil	8
Butylate	802
Chloridazon	5
Chlorimuron Ethyl	1393
Chloroxuron	40
Chlorpropham	741
Chlorthal-dimethyl	18475
Clethodim	200
Clomazone	2318
Clopyralid	5
Cyanazine	20551
Cycloate	1193
Dicamba	5121
Dichlobenil	1117
Diethatyl Ethyl	416
Diphenamide	312
Diquat	4
Dithiopyr	19
Diuron	4427
DSMA, MSMA	16
EPTC	691
Fenoxaprop-ethyl	2133
Fluazifop-butyl	354
Flumetsulam	151
Flumiclorac-pentyl	9
Fomesafen	2670
Glufosinate-ammonium	41
Glyphosate	34480
Glyphosate-trimesium	363
Halosulfuron-methyl	10
Hexazinone	392
Imazamox	15
Imazapyr	<1
Imazaquin	565
Imazethapyr	784
Isoxaben	1394
Lactofen	569
Linuron	7312
MCPA	4
Mecoprop	1504
Metolachlor	116167
Metribuzin	2344
Metsulfuron-methyl	4
Napropamide	8177
Naptalam	1363
Nicosulfuron	132
Norflurazon	7338
Oryzalin	5819
Oxadiazon	387
Oxyfluorfen	591
Paraquat	14593
Pebulate	232
Pelargonic acid	250
Pendimethalin	7861
Phenmedipham	486
Picloram	5
Primisulfuron	91
Prodiamine	314
Prometon	56
Pronamide	1815
Propachlor	1075
Prosulfuron	57
Pyridate	11
Quizalofop-ethyl	391
Rimsulfuron	583
Sethoxydim	591
Simazine	7346
Sulfentrazone	6400
Terbacil	2213
Thifensulfuron	716

Triclopyr	32
Trifluralin	2573
TOTAL HERBICIDES:	456513

INSECTICIDES:

Abamectin	12
Acephate	7390
Amitraz	10
Avermectin	7
Azadirachtin (Neem)	7
Azinphos-methyl	20559
Bendiocarb	13
Bifenthrin	88
Bromchlophos	269
Bt, Microbials	334
Carbaryl	15128
Carbofuran	6930
Chlorethoxyfos	508
Chlorpyrifos	14949
Chlorpyrifos-methyl	9
Clofentezine	74
Cyfluthrin	164
Cyhalothrin	1011
Diazinon	10008
Dichlorvos	8
Dicofol	992
Dienochlor	81
Dimethoate	4369
Disulfoton	600
Endosulfan	7362
Ethion	2
Ethoprop	554
Fenamiphos	640
Fenbutatin oxide	513
Fenpropathrin	23
Fenvalerate	561
Fluvalinate	39
Fonofos	2546
Formetanate HCL	298
Hexakis	2
Hexythiazox	38
Imidacloprid	866
Isazofos	117
Isofenphos	2
Lindane	206
Malathion	8990
Methamidophos	209
Methidation	197
Methiocarb	30
Methomyl	18161
Methoxychlor	17
Nicotine	24
Oil	47122
Oxamyl	2427
Oxydemeton-methyl	169
Parathion-methyl	2018
Permethrin	2710
Phorate	625
Phosmet	5336
Phosphamidon	2
Propargite	4
Propoxur	1
Pyrethrin	39
Pyridaben	80
Resmethrin	3
Rotenone	13
Soap	2405
Sodium aluminoflrd	106
Tebufenozide	51
Tefluthrin	1097
Terbufos	6663
Thiodicarb	633
Trichlorfon	428
TOTAL INSECTICIDES:	196849

FUNGICIDES:

Azoxystrobin	40
Benomyl	6049
Captafol	10
Captan	74510
Carboxin	31
Chlorothalonil	82403
Copper salts	29795
Dazomet	28
Dicloran	2
Dinocap	3

Dodine	1269
Etridiazole	665
Fenarimol	100
Fenbuconazole	94
Ferbam	18822
Fludioxonil	1
Fosetyl-al	2125
Glyodin	10
Iprodione	1978
Mancozeb/Mnb/Znb	52808
Mefenoxam	2945
Metalaxyl	9974
Metiram	2961
Myclobutanil	593
Oxythioquinox	193
Propiconazole	1119
Quintozene	4233
Oxycarboxin	<1
Piperalin	28
Propamocarb HCL	36
Sulfur	235807
Tebuconazole	1
Thiabendazole	14
Thiophanate	3573
Thiophanate-methyl	1232
Thiram	139
Triadimefon	1029
Triflumizole	2
Triforine	221
Vinclozolin	636
Ziram	11782
TOTAL FUNGICIDES:	547261

RODENTICIDES:

Bromadiolone	<1
Bromethalin	<1
Chlorophacinone	<1
Diphacinone	<1
Zinc Phosphide	16
TOTAL RODENTICIDES:	16

GROWTH REGULATORS:

Ancymidol	1
Chlormequat chloride	148
Cyromazine	33
Cytokinin	<1
Daminozide	822
Diflubenzuron	72
Ethephon	631
Fenoxycarb	10
Gibberellic acid	9
Indole-3-butyric acid	<1
Kinoprene	65
Methyl octanoate	422
NAA, NAD	13
Paclobutrazol	2
Uniconazole	<1
TOTAL HORMONES:	2228

FUMIGANTS:

Metam sodium	221672
Methyl bromide	4116
Sulfotep	80
TOTAL FUMIGANTS:	225868

BACTERICIDES:

Ammonium chloride	239
Oxatetracycline	796
Streptomycin	268
TOTAL BACTERICIDES:	1303

MISCELLANEOUS:

Calcium chloride	1813
Magnisium sulfate	50
Metaldehyde	18
Piperonyl butoxide	85
Stirrup (sex hormone)	2
TOTAL MISCELLANEOUS:	1968

TOTAL PESTICIDE USE: 1432006

Herbicides:	32%
Insecticides:	14%
Fungicides:	38%
Fumigants:	16%
Other:	<1%

TABLE II. Highest use compounds in 1997 from the main pesticide categories. Shown are compounds >= 5% of class.

Compound	Lbs active ingredient	% of class	% of total use
HERBICIDES:			
Metolachlor	116167	25%	8.1%
Acetochlor	46171	10%	3.2%
Atrazine	45700	10%	3.1%
Glyphosate	34480	8%	2.4%
Alachlor	30143	7%	2.1%
Cyanazine	20551	5%	1.4%
INSECTICIDES:			
Oil	47122	24%	3.2%
Azinphos-methyl	20559	10%	1.4%
Methomyl	18161	9%	1.2%
Carbaryl	15128	8%	1.0%
Chlorpyrifos	14949	8%	1.0%
Diazinon	10008	5%	<1%
Malathion	8990	5%	<1%
FUNGICIDES:			
Sulfur	235807	43%	16.4%
Chlorothalonil	82403	15%	5.7%
Captan	74510	14%	5.2%
Mancozeb	52808	10%	3.6%
Copper Salts	29795	5%	2.0%
FUMIGANTS:			
Metam-Sodium	221672	98%	15.4%

TABLE III. Total pesticide amounts (in pounds active ingredient) applied to crops in 1997.

CROP	AMOUNT	% of Total Pesticide Use
Apples	104314	7.3
Peaches	301334	21.0
Other Tree Fruit	7362	0.5
Blueberries	62984	4.4
Cranberries	69396	4.9
Strawberries	4821	0.3
Grapes	1458	0.1
Sweet Corn	33668	2.4
Field Corn	188001	13.1
Grains	3193	0.2
Soybeans	129356	9.0
Beans/Peas	7557	0.5
Asparagus	3655	0.3
Cucumbers	29538	2.1
Tomatoes	44628	3.1
Peppers	61732	4.3
Eggplants	21998	1.5
Potatoes	27081	1.9
Chinese Vegetables	10289	0.7
Cabbage	8219	0.6
Cauliflower	438	0.0
Broccoli	2108	0.2
Brussel Sprouts	1156	0.1
Other Cole	2416	0.2
Lettuce	17327	1.2
Spinach	7981	0.6
Leafy Greens	10260	0.7
Other Leafy	3305	0.2
Hay/Alfalfa	4853	0.3
Sod	13562	0.9
Ornamentals	64812	4.5
Livestock	2	0.0
no code*	183179	12.8
ALL CROPS	1432006	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 1997.

COUNTY	Amount	% Total Use
Atlantic	182254	13%
Bergen	2847	<1%
Burlington	173356	12%
Camden	12865	1%
Cape May	4251	<1%
Cumberland	225431	16%
Essex	64	<1%
Gloucester	366274	26%
Hudson	0	<1%
Hunterdon	45495	3%
Mercer	27454	2%
Middlesex	32304	2%
Monmouth	60864	4%
Morris	18575	1%
Ocean	10943	1%
Passaic	490	<1%
Salem	180006	13%
Somerset	17034	1%
Sussex	10710	1%
Union	243	<1%
Warren	60541	4%
TOTAL	1432006	100%