NJ Department of Environmental Protection
Pesticide Control Program
Pesticide Evaluation & Monitoring

GOLF COURSE PESTICIDE USE IN NEW JERSEY – 2005 SURVEY

The New Jersey Pesticide Control Program (NJPCP) began a series of golf course pesticide use surveys in 1990. The specific purpose of this project is to identify what chemicals and how much of each are being used in on golf courses for trends analysis. A more general purpose of the survey is to supplement data gathered from previous pesticide use surveys for addressing the impact of pesticide use statewide. The survey is conducted every three years. This report focuses on the 2005 survey.

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.

For 2005, surveys were mailed to all New Jersey golf courses. Survey forms, along with instructional letters and a return envelope, were mailed to the superintendent or responsible applicator asking for their 2005 pesticide use. A list of these golf courses was kept in the office and marked off as surveys were returned. Second and third mailings, the third being certified, were made to non-respondents indicating that the previously mailed survey had not been received.

Each survey form received by the PCP was entered into a database. When the data entry was completed the database was reviewed for any duplication of entries. Subroutines in the database identified active ingredients and calculated pounds of active ingredients from the information supplied by the applicators.

Once all three mailings were completed, 241 out of 270 (89%) surveys were received.

Table 1 lists the chemicals and their respective amounts appearing in the survey. Fungicides dominate golf course pesticide use.

Table 2 selects out the highest use compounds. Chlorothalonil was by far the most commonly used pesticide in 2005 on golf courses.

Table 3 shows pesticide use by site. Applications are relatively equal between Green/Tee and Fairway areas.

Table 4 lists pesticide use on golf courses by county and the number of golf courses surveyed in each county.

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. 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.

Table 1. Pesticide amounts (lbs active ingredient) reported in the New Jersey 2005 Golf Course Pesticide Use Survey.

HERBICIDES:	
2,4-D	4215
2,4-DP	99
Benfluralin	621
Bensulide	1586
Bentazon	2
Bispyribac-sodium	4
Carfentrazone	10
Chlorsulfuron	<1
Chlorthal-dimethyl	34
Clopyralid	400
Dicamba	672
Dithiopyr	2900
DSMA,MSMA	541
Ethofumesate	36
Fenoxaprop-ethyl	177
Fluazifop-butyl	<1
Glufosinate-ammonium	22
Glyphosate	273
Glyphosate-trimesium	38
Isoxaben	1
MCPA	43
Mecoprop	1129
Mefenoxam	387
Metalochlor	2
Oryzalin	45
Oxadiazon	190
Pelargonic acid	25
Pendimethalin	1494
Prodiamine	1736
Quinclorac	354
Siduron	361
Triclopyr	513
Trifluralin	254
TOTAL HERBICIDES:	18166

INSECTICIDES:	
Acephate	570
Bacillus (biological)	3
Bendiocarb	72
Bifenthrin	280
Carbaryl	4960
Chlorpyrifos	2381
Cyfluthrin	143
Cyhalothrin	222
Deltamethrin	80
Diazinon	2
Fenamiphos	107
Fenbutatin	<1
Fluvalinate	1
Halofenozide	796
Imidacloprid	6248
Isazofos	4
Metaldehyde	464
Methoxychlor	1
Oil	<1
Permethrin	44
Trichlorfon	9239
TOTAL INSECTICIDES:	25619

FUNGICIDES:	
Azoxystrobin	825
Boscalid	333
Chloroneb	164
Chlorothalonil	150025
Copper	876
Cyproconazole	<1
Dazomet	238
Etridiazole	852
Fenarimol	33
Fludioxonil	314
Flutolanil	1414
Fosetyl-al	30071
Iprodione	24332
Mancozeb	14978
Metalaxyl	2495
Myclobutanil	409
PMA	3
Polyoxin D	336

Potassium phosphite	1607
Potassium salts	4157
Propamocarb HCl	21016
Propiconazole	5650
Pyraclostrobin	442
Quintozene	5207
Thiophanate	10057
Thiophanate-methyl	4978
Thiram	6548
Triadimefon	6580
Trifloxystrobin	537
Vinclozolin	30895
TOTAL FUNGICIDES:	325373

TOTAL PESTICIDE USE: 374805

Herbicides:	5 %
Insecticides:	7 %
Fungicides:	87 %
Growth Reg:	1 %
Bird Repellents:	<1%
Miscellaneous	<1%

GROWTH REGULATORS:

Dikegulac sodium	2
Ethephon	2481
Flurprimidol	291
Mefluidide	101
Paclobutrazol	212
Trinexapac-ethyl	1661
TOTAL GROWTH REG:	4748

BIRD REPELLENTS

Anthraquinone	167
TOTAL REPELLENTS:	167

MISCELLANEOUS

Ammonium chloride	25
Dyes	7
Hydrogen peroxide	445
Phosphoric acid	213
Sodium Percarbonate	43
TOTAL MISC:	733

Table 2. Highest use compounds from the main pesticide categories, 2005 golf course survey. Shown are compounds >= 5% of class.

Compound	Lbs active ingredient	% of class	% of total use
HERBICIDES:			
2,4-D	4215	23.2%	1.1%
Dithiopyr	2900	16.0%	0.8%
Prodiamine	1736	9.5%	0.5%
Bensulide	1586	8.7%	0.4%
Pendimethalin	1494	8.2%	0.4%
Mecoprop	1129	6.2%	0.3%
INSECTICIDES:			
Trichlorfon	9239	36.1%	2.5%
Imidacloprid	6248	24.4%	1.7%
Carbaryl	4960	19.4%	1.3%
Chlorpyrifos	2381	9.3%	0.6%
FUNGICIDES:			
Chlorothalonil	150025	46.1%	40.0%
Vinclozolin	30895	9.5%	8.2%
Fosetyl-al	30071	9.2%	8.0%
Iprodione	24332	7.5%	6.5%
Propamocarb HCl	21016	6.5%	5.6%
GROWTH REGULATORS:			
Ethephon	2481	52.2%	0.7%
Trinexapac-ethyl	1661	35.0%	0.4%

Table 3. Total pesticide amounts (in pounds active ingredient) applied to the various sites, 2005 golf course survey.

SITE	AMOUNT	% Total
Greens/Tees	162249	43%
Fairways	186216	50%
Rough	26340	7%

Table 4. Total pesticide amounts (in pounds active ingredient) by county, 2005 golf course survey.

COUNTY	# of Courses	Amount	% of Total
Atlantic	15	19913	5.3%
Bergen	20	32887	8.8%
Burlington	15	26973	7.2%
Camden	9	11217	3.0%
Cape May	6	11424	3.0%
Cumberland	1	239	0.1%
Essex	15	24136	6.4%
Gloucester	6	4470	1.2%
Hudson	0	0	0.0%
Hunterdon	7	9728	2.6%
Mercer	12	13891	3.9%
Middlesex	10	15223	4.1%
Monmouth	27	58776	15.7%
Morris	19	26702	7.1%
Ocean	16	21251	5.7%
Passaic	6	10121	2.7%
Salem	4	3325	0.9%
Somerset	20	42657	11.4%
Sussex	15	8953	2.4%
Union	11	25293	6.7%
Warren	7	7625	2.0%
	241	374805	100.0%