

GOLF COURSE PESTICIDE USE IN NEW JERSEY – 1993 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 1993 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 1993 use, 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 1993 pesticide use. A list of these golf courses was kept in the office and marked off as surveys were returned. Second and third mailings 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, 207 out of 218 (95%) 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 1993 on golf courses, followed by trichlorfon and chlorthal-dimethyl.

Table 3 shows pesticide use by site. Fairways receive the highest overall pesticide use.

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. 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.

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Table 1. Pesticide amounts (lbs active ingredient) reported in the New Jersey 1993 Golf Course Pesticide Use Survey.

HERBICIDES:		Fonofos	225
2,4-D	1919	Isazofos	378
Amitrol	2	Isofenphos	1008
Benfluralin	1647	Oil	27
Bensulide	2763	Oxydemeton	3
Bentazon	59	Trichlorfon	11282
Chlorsulfuron	3	TOTAL INSECTICIDES:	32955
Chlorthal-dimethyl	7626		
Clopyralid	74		
Dicamba	898	FUNGICIDES:	
Dichlobenil	1	Anilazine	5038
Diquat	2	Benomyl	1047
Dithiopyr	1000	Chloroneb	578
DSMA, MSMA	80	Chlorothalonil	54878
Ethofumesate	510	Cycloheximide	1
Fenoxaprop-ethyl	155	Cyproconazole	16
Glyphosate	433	Etridiazole	340
Isoxaben	62	Fenarimol	535
Mecoprop	2701	Flutolanil	304
Metalochlor	2	Fosetyl-al	5237
Oryzalin	62	Iprodione	11375
Oxadiazon	228	Mancozeb	13335
Pendimethalin	2587	Mercurous Chloride	605
Picloram	<1	Metalaxyl	6074
Prodiamine	67	Myclobutanil	7
Siduron	333	PMA	118
Triclopyr	203	Propamocarb HCl	11121
Trifluralin	279	Propiconazole	2529
TOTAL HERBICIDES:	23696	Quintozene	3479
		Sulfur	135
		Thiophanate	6347
INSECTICIDES:		Thiophanate-methyl	213
Bendiocarb	8125	Thiram	10079
Bt	12	Triadimefon	5606
Carbaryl	2650	Vinclozolin	5792
Chlorpyrifos	8662	TOTAL FUNGICIDES:	144789
Cyfluthrin	1		
Dicrotophos	23		
Disulfoton	22		
Ethoprop	341		
Fenamiphos	157	GROWTH HORMONES:	
Fluvalinate	39		

Amidochlor	4
Ammonium chloride	27
Azadirachtin	1
Flurprimidol	623
Mefluidide	25
Paclbutrazol	141
Trinexapac-ethyl	95
TOTAL GR HORMONES:	916

TOTAL PESTICIDE USE: 202356

Herbicides:	11.7%
Insecticides:	16.3%
Fungicides:	71.5%
Growth Hormones:	0.5%

Table 2. Highest use compounds from the main pesticide categories, 1993 golf course survey. Shown are compounds $\geq 2\%$ of class.

Compound	Lbs active ingredient	% of class	% of total use	
HERBICIDES:				
Chlorthal-dimethyl	7626	32.2%	3.8%	
Bensulide	2763	11.7%	1.4%	
Mecoprop	2701	11.4%	1.3%	
Pendimethalin	2587	10.9%	1.3%	
2,4-D	1919	8.1%	0.9%	
Benfluralin	1647	7.0%	0.8%	
Dithiopyr	1000	4.2%	0.5%	
Dicamba	898	3.8%	0.4%	
INSECTICIDES:				
Trichlorfon	11282	34.2%	5.6%	
Chlorpyrifos	8662	26.3%	4.3%	
Bendiocarb	8125	24.7%	4.0%	
Carbaryl	2650	8.0%	1.3%	
Isofenphos	1008	3.1%	0.5%	
FUNGICIDES:				
Chlorothalonil	54878	37.9%	27.1%	
Mancozeb	13335	9.2%	6.6%	
Iprodione	11375	7.9%	5.6%	
Propamocarb HCl	11121	7.7%	5.5%	
Thiram	10079	7.0%	5.0%	
Thiophanate/T-methyl	6560	4.5%	3.2%	
Metalaxyl	6074	4.2%	3.0%	
Vinclozolin	5792	4.0%	2.9%	
Triadimefon	5606	3.9%	2.8%	
Fosetyl-al	5237	3.6%	2.6%	
Anilazine	5038	3.5%	2.5%	
Quintozene	3479	2.4%	1.7%	
GROWTH HORMONES:				
Flurprimidol	623	68.0%	0.3%	
Paclobutrazol	141	15.4%	0.1%	
Trinexapac-ethyl	95	10.4%	<0.1%	
Mefluidide	25	2.7%	<0.1%	

Table 3. Total pesticide amounts (in pounds active ingredient) applied to golf course sites, 1993 survey.

<u>SITE</u>	<u>AMOUNT</u>	<u>% Total</u>
Greens/Tees	75572	37%
Fairways	115343	57%
Rough	11393	6%
No site code	48	0%

Table 4. Total pesticide amounts (in pounds active ingredient) by county, 1993 golf course survey.

<u>COUNTY</u>	<u># of Courses</u>	<u>Amount</u>	<u>% of Total</u>
Atlantic	11	4633	2.3%
Bergen	23	24138	11.9%
Burlington	16	16301	8.0%
Camden	6	6208	3.0%
Cape May	6	4951	2.4%
Cumberland	2	534	0.3%
Essex	16	22350	11.0%
Gloucester	7	3297	1.6%
Hudson	0	0	0.0%
Hunterdon	5	6107	3.3%
Mercer	8	3768	3.9%
Middlesex	10	11897	5.6%
Monmouth	22	25945	14.3%
Morris	18	18178	6.4%
Ocean	10	6517	3.3%
Passaic	5	5622	3.0%
Salem	4	1193	0.6%
Somerset	10	14357	7.5%
Sussex	6	3266	3.3%
Union	11	20949	6.9%
Warren	5	2145	1.7%
	201	202356	100.0%