

Pesticide Use By County Governments: Reducing The Risk



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Preface to the 2000 Revision

Counties often applied pesticides routinely, rather than in response to a recognized pest problem.

Since this report was first released by the New York State Attorney General's office in August 1997 there has been progress in the way that county and other local governments in New York State manage pest problems, and new resources have become available to assist them in their efforts. With the reprinting of this report,¹ we renew our call for change in the pest management policies and practices of the counties, and extend that challenge to the governments of all of New York's cities, towns and villages. Although we surveyed county governments, the recommendations based on the findings of that survey can be applied equally to other levels of government.

Counties often delegated important decisions, with potential impacts on the health and well-being of county residents and employees, to independent contractors.

As we originally reported, county governments across New York State applied a wide variety of toxic pesticides to control insects, rodents, weeds and other pests at their own facilities. Many pesticides were applied routinely, rather than in response to a recognized pest problem. This practice often results in excessive, and unnecessary, pesticide applications. Counties often delegated important decisions, with potential impacts on the health and well-being of county residents and employees, to independent contractors. Too often, they did not adequately inform the public about pesticide applications.

To help remedy this situation, we recommended centralization of county pest management activities, adoption of policies and practices designed to control problem pests while minimizing pesticide applications, and improved public participation and notice. According to one recent investigation, five states have notification requirements for pesticide applications to government buildings (Georgia, Massachusetts, Michigan, Montana and New Jersey).²

Events in late 1999 amply demonstrated the need for thoughtful and coherent pest management planning, and the high level of public concern about pest control issues. With concerns about a potential epidemic of West Nile-like encephalitis, a mosquito-borne viral disease, county and local governments in the metropolitan New York city area felt compelled to react decisively. In some cases, extensive aerial spraying with insecticides, distribution of insect repellants³ and ill-advised assurances of their safety⁴ precipitated

Too often, Counties did not adequately inform the public about pesticide applications.

criticism from the public, and indeed from independent health experts. Dr. Philip J. Landrigan, Director of the Center for Children's Health and the Environment at Mt. Sinai School of Medicine has cautioned about the potential health effects of spraying malathion, explaining the benefits of preventive measures that minimize the need for pesticides. "Unless officials regard chemical insecticides like Malathion as a tactic of last resort," he warned, "one public health emergency will be worsened by another."⁵

Had the localities adopted policies and practices to establish long term, stable integrated pest management, as recommended in this report, this situation may well have been avoided. Mosquitoes would have been controlled in their larval stage, and at their sources. Proper notice and public participation would have mitigated rather than magnified public concerns. The Attorney General recommends that rather than starting a new millennium with the same reactive practices that led to this situation, we learn from this experience and develop proactive, pro-health and pro-environment pest management policies.

There has been some progress since our last report by a handful of New York county governments to reduce the use of pesticides on county property. (Because state law preempts local governments from regulating the use of pesticides, county governments can only dictate their own use of pesticides on their own property, such as county buildings, parks, and golf courses.)

As noted in the 1997 report (p. 23), Nassau County enacted an Integrated Pest Management Executive Order in 1995. Implementation was still in the early stages in 1997. Since then, implementation has expanded significantly, particularly inside buildings. Nassau assigns a staff person in each county building to work with pest control companies. Before applying pesticides, the pest control company records pest problems in a building log, consults with the county staff person in the building, and seeks non-toxic solutions to pest problems. To reduce pesticide use in outside areas, Nassau bought new equipment to remove blockages in trenches and reduce standing water, in which mosquitoes breed. While there is an IPM program in each of the county parks, pesticide use reduction appears to have been less significant. Overall, Nassau County relies on a Pesticide Advisory Committee made up of county employees and environmental and civic group members, which meets every two months, and an IPM Committee of county employees.

More recently, in April 1999, Onondaga County Executive Nicholas J. Pirro issued an Executive Order, which established an IPM policy for Onondaga County facilities. The most notable aspect of the Executive Order is that “chemical pesticides should be purchased and used by the County only where feasible alternatives are not available.” Each county department is to designate an IPM Coordinator and public access to pesticide use records is enhanced.

Pesticide Sunset Ordinances provide a schedule and decision-making framework for progressive pesticide use reduction.

Probably the most significant progress was made by local governments passing “Pesticide Sunset” ordinances.⁶ Modelled generally after the 1996 San Francisco ordinance discussed below, these ordinances provide a schedule and decision-making framework for the progressive reduction in pesticide use at the localities’ own facilities.⁷ Albany County, the cities of Buffalo and Albany, the towns of Bethlehem and Greenburgh, and most recently, Suffolk County (on January 1, 2000) have all adopted such Pesticide Sunset ordinances. In April 2000, Westchester County Executive Andrew Spano announced that he will introduce a Pesticide Sunset ordinance. (We attach the Albany ordinance as a model for other counties in Appendix 4.) The Suffolk ordinance, for example, requires a Pest Management Plan to be adopted by December 31, 2000. The Plan must phase out the use of the most toxic pesticides first and ultimately require non-chemical pest control by January 1, 2002. A pest management committee consisting largely of county employees has been established, along with a County Advisory Committee including members of the public.⁸

Some localities have adopted comprehensive local pesticide use reduction laws, resulting in elimination of broadcast pesticide applications from parks.

Another area of county government progress has occurred on county-run golf courses. Suffolk County adopted an organic golf resolution in October of 1997 and now uses a number of organic products at its golf courses. County staff have been trained in organic turf management. The shift toward organic golf courses was aided by a 1998 court decision in *Lewis v. Gaffney*, which required the county to seriously consider using organic methods rather than IPM at five new proposed municipal golf courses.⁹

Outside New York, other local governments have taken even stronger steps and, with a longer history of implementation, have developed a proven track record. On October 8, 1996, the San Francisco Board of Supervisors unanimously adopted a comprehensive local pesticide use reduction law. Covering all facilities owned or leased by the city and county, the new law requires that the most toxic pesticides (those linked to cancer, or reproductive

damage and those with high acute toxicity) be banned and others be phased out over time. The ordinance also requires that there be 72-hour advance notice and notice after application in the rare instances when pesticides are used. Typically, the notification is a posted sign stating the name of the pesticide, active ingredient, target pest, area to be treated, date and time of application and who to contact for further information. One of the most impressive results of the local law is the elimination of broadcast pesticide application from all playing fields and parks - especially important in such areas, where children and pets come in direct contact with the turf. To help assure effective implementation of the ordinance, the city hired a Pesticide Reduction Program Coordinator and established a Technical Advisory Committee.¹⁰

Such local pesticide management programs are highly effective, as careful studies have shown. For example, in March 1998 the United States Environmental Protection Agency (EPA) reported on the efforts of the City of Santa Monica, California “to identify and purchase products and services that minimize the burden on the environment and human health.”¹¹ One element of Santa Monica’s program “... was to reduce the risks associated with the use of chemical pesticides, as well as the amount of toxic pesticides used.”¹² Santa Monica had no prior experience with Integrated Pest Management (IPM). The city thus required that pest control contractors, seeking to work for the city, provide detailed descriptions of their experience, and their health and safety programs for employees and site occupants. The city further required vendors to rank pest management options by risk to human health and the environment, to provide details of their monitoring and quality control programs, and to set forth a format for training city workers in ways to prevent pest problems. The contractor specifications include criteria to protect human health and the environment, to determine the products and techniques to be employed, and to establish overall supervision by a city IPM coordinator. As reported by EPA, Santa Monica:

“Achieved excellent control of pests ... in and around all city-owned structures.”

“Reduced number of complaints received by facilities managers.”

“Reduced the hazard associated with pesticide applications .”

“Received excellent service from pest control contractor.”

“Reduced the cost of pest control services by 30 percent.”

“Educated staff in how to prevent pests.”

“Increased awareness ... to catch pest problems in early stages.”

“Created a cadre of individuals who can take IPM lessons back to their homes and communities.”¹³

Cape May County (NJ) reported an astounding 98% reduction in pesticide use, with substantial savings in expenditures.

Santa Monica’s experience is not unique. With grant support from EPA, the National Association of Counties recently developed and released the “Local Government Environmental Purchasing Starter Kit - A Guide to Greening Government through Powerful Purchasing Decisions.”¹⁴ The kit contains, among other items, a case study of pest management by Cape May County, NJ.¹⁵ Cape May County manages approximately 50 facilities, including the county’s administrative building, courthouse, corrections center, senior centers, libraries, nursing home and youth shelter. The case study includes an overview of the Cape May program, its history, philosophy, and itemized specifications for bids submitted for IPM services. According to Cape May, the first year of implementation resulted in a 24 percent reduction in costs, as compared to the previous year’s total expenditure of \$24,488. The second year, saw a 52 percent reduction from the same baseline figure. The reduction in cost was attributed primarily to reductions in pesticide use. Prior to the IPM program, the county generally applied more than 50 pounds of pesticide active ingredients per year in its facilities. Through their IPM program, Cape May County reduced active ingredient applications to less than one pound per year. This represents an astounding 98% reduction in pesticide use in one year! As reported, the Cape May program has maintained or exceeded the county’s standards for pest eradication. It also has the support of county employees and the public, who are pleased with the results.

The New York State legislature provided \$250,000 for municipalities to implement non-toxic alternatives.

The programs in Santa Monica and Cape May illustrate what can be accomplished by other municipal, county and state governments across the nation. We list additional sources of information in Appendix 3 of this report. Traditional pesticide-dependent pest management policies can be revised to protect public health and the environment while achieving both excellent pest control and reduced costs. Resources and practical guidance are available for

those who would like to initiate similar programs. In fact, the New York State legislature included \$250,000 in the fiscal year 1999-2000 budget “for the purpose of making grants to municipalities to implement non-toxic alternatives to pesticides in their pest management programs. Such funding may be used to train municipalities in non-toxic methods of pest control, and for making basic structural improvements which inhibit pest infestations in structures.”¹⁴ The funds are administered by the New York State Department of Environmental Conservation.

The credit for the passage and implementation of these initiatives goes to the local citizens and legislators who worked to promote them. Hopefully, these efforts will serve as a local example for other counties and municipalities in New York.

With the release of this updated report, the Attorney General renews the call for change in the way counties and other local governments manage pest problems. Preventive pest control programs, which minimize reliance on pesticides to the greatest extent possible, can provide stable long-term pest management while protecting public health, the environment and the budgets of localities that choose to implement them.

Preface Endnotes:

¹ The report that follows is reprinted exactly as it appeared when first released in August 1997 as “Pest Management By The Counties: A Call For Change.” Appendix 4, which listed other relevant reports by the Attorney General’s office, has been deleted, as some of those reports have been revised and updated. All of the Attorney General’s current reports on pest management topics can be found at www.ag.ny.gov/bureaus/environmental/about.html

² Owens, K. & J. Feldman, “The Building of State Indoor Pesticide Policies.” *Pesticides and You* 18(4):9-17, 1999

³ In New York City, insect repellent sprays were distributed to the public under circumstances that would likely promote misapplication and overuse. The public was not adequately warned about potential adverse effects of the repellents, especially to infants and other potentially sensitive individuals.

⁴ Despite federal and state prohibitions of safety claims for pesticides (see Federal Insecticide, Fungicide and Rodenticide Act, 7 USC §136j, federal pesticide labelling regulations at 40 C.F.R. 162.10(a)(5)(ix) and New York State Environmental Conservation Law § 33-1301) some local government officials offered assurances that the pesticides being applied were safe for humans and the environment. The Attorney General contacted several officials, explained the applicable limitations and urged their compliance with both the letter and the spirit of the law.

⁵ Landrigan, P.J. “Malathion May Be a Necessary Evil” *Newsday*, Sept. 14, 1999.

⁶ Because New York State law reserves the regulation of pesticides for the Commissioner of the Department of Environmental Conservation, these local ordinances merely establish policies to be applied by the local government on its own properties. They do not impose any restriction on the practices of others, although they may serve as an example of policies that other entities might choose to follow.

⁷ See, for example, Albany County Resolution No. 46-a adopted unanimously by the Albany County Legislature May 11, 1998. Of course each locality can evaluate and revise the provisions to best fit local needs, while preserving the essential goals of the program.

⁸ Suffolk County Local Law 10-1996, “A Local Law To Establish Integrated Pest Control Measures For Suffolk County Properties,” June 11, 1996.

⁹ Lewis v. Gaffney, No. 09200/97 (Sup. Ct. Suffolk Co. March 31, 1998) (Order and decision.)

¹⁰ The Pesticide Reduction Program Coordinator for the City of San Francisco (Ms. Deborah Raphael) can be reached at the Department of the Environment, 1540 Market Street, Suite 160, San Francisco, CA 94102 or debbie_raphael@ci.sf.ca.us or 415-554-6399.

¹¹“The City of Santa Monica’s Environmental Purchasing - A Case Study.” EPA Office of Pollution Prevention and Toxics, EPA 742-R-98-001, March 1998. See www.epa.gov/opptintr/epp/success.html#4 for full text.

¹² Ibid. P. 18.

¹³ Ibid. P. 20.

¹⁴ The kit, and additional information on environmental purchasing can be obtained by contacting the National Association of Counties’ Environmental Purchasing Project [202-942-4262 (phone), 202-737-0480 (fax)], or at www.naco.org/programs/environ/purchase.cfm.

¹⁵ “Case Study: Pest Control - Cape May County, New Jersey” in “Local Government Environmental Purchasing Starter Kit - A Guide to Greening Government through Powerful Purchasing Decisions.”

¹⁶S6108, § 10(3), signed by the Governor on August 8, 1999.

I. INTRODUCTION

County governments in New York State own, operate, and administer a wide variety of properties and facilities. In addition to County business offices, there are libraries, schools, indoor and outdoor recreational facilities, healthcare and correctional institutions, housing, maintenance and work shops, garages, roads, and waste handling and processing facilities. The number and diversity of facilities under the auspices of a County government can be surprising. It is the responsibility of County governments to protect these resources, to maximize their utility, and to facilitate the public's use and enjoyment of them. Among the many concerns which must be addressed at these facilities is the management of pest problems.

Pest problems can be even more numerous and diverse than the facilities at which they occur. Indoors, there may be a variety of insects, spiders, and rodents. Outdoors, there are weeds, rodents and other small mammals, biting and stinging insects, and even nuisance birds. As a group, pests may threaten the public health, the integrity of structures, or the success of desirable species of plants and animals. They may interfere with the use and enjoyment of public facilities, both indoors and out.

This report is the culmination of an examination of pest management policies and practices of County governments in New York State, that was conducted by the Environmental Protection Bureau of the New York State Attorney General's office. It is intended to highlight both those areas in which the governments have done well and those in which they have not. We provide recommendations for improvements and sources of additional information.

This project could not have been completed without the cooperation and contributions from many County administrators and their staff. Valuable time and effort went into the responses to our survey and in follow-up conversations with Environmental Protection Bureau staff. We appreciate the extraordinary effort that was expended by the respondents to our survey, and we hope that this report will prove useful as both a stimulus for change and a resource for pest management activities.

II. SURVEY METHODS

A questionnaire was sent to the chief executive or other officer of each of New York's 62 Counties in August 1996. The five Counties which comprise New York City (Bronx, Kings, New York, Queens and Richmond) generally occupy space which is owned and operated by New York City. They do not own or operate many of the sorts of facilities for which other Counties have responsibilities. In their case, pest management functions for County facilities is assumed by New York City. As a matter of practicality, these five Counties were excluded from this project, leaving a total of 57 Counties contacted.

Through the Fall and Winter we made follow-up calls to the Counties which had not responded. We offered assistance in completing the questionnaire and clarification of the questions wherever necessary. Some questionnaires were returned incomplete or with unclear or ambiguous responses; in these cases we were often able to obtain more useful responses with follow-up calls. In many cases, it was necessary to call several County offices, speak to a variety of County employees and sometimes contact outside contractors. In general, we enjoyed a high level of cooperation.

III. RESULTS

Response Rate

Of the 57 Counties surveyed, 45 (see Table 1) responded to our inquiry - a 79% response rate which provides us with a reliable reflection of the pest management policies and practices of Counties throughout New York State. Data reported was primarily for 1995, although a few Counties included 1996 data.

Table 1: Responding Counties

Allegany	Orange
Broome	Orleans
Cattaraugus	Oswego
Chautauqua	Otsego
Chemung	Putnam
Chenango	Rensselaer
Clinton	Rockland
Columbia	Saratoga
Cortland	Schenectady
Delaware	Schuyler
Erie	Seneca
Genessee	St. Lawrence
Greene	Steuben
Hamilton	Suffolk
Jefferson	Sullivan
Livingston	Tioga
Monroe	Tompkins
Montgomery	Ulster
Nassau	Warren
Oneida	Washington
Onondaga	Westchester
Ontario	Wyoming

Yates

Pest Management Policies

Of the 45 responding Counties, only nine reported having any written policy or guidance regarding pest management practices, either indoors or out. The nine written documents were split evenly between local legislation, executive orders, and other guidance documents.

Problem Pests

All Counties reported taking action to control at least one problem pest, with some reporting a variety of pests, indoors and out. Not surprisingly, ants, cockroaches, and rodents were frequent indoor problems, while weeds, stinging and biting insects, and rodents were those most frequently reported outdoors. Table 2 summarizes the pests reported and their frequency.

Table 2: Frequently Reported Pests

Indoors:

Ants (38)*
Cockroaches (29)
Mice & Rats (28)
Spiders (22)

Outdoors:

Weeds (34)
Stinging & Biting Insects (21)
Mice & Rats (17)
Insect Plant Pests (14)
Pigeons & Other Birds (9)
"Other" Plant Pests (6)

* Number of Counties reporting.

Pest Control Methods Used

When pest populations reach a level which requires action, pests may be managed by a variety of control methods or by a combination of methods.

Non-pesticidal control methods are widely used. Thirty-five Counties reported using non-chemical controls for indoor pests. These included mechanical devices (*e.g.* traps - 35 Counties), improved sanitation (30 Counties), and physical controls such as barriers and steam treatments (20 Counties). Thirty-nine Counties used non-chemical controls for outdoor pests, the most common being mechanical methods such as traps for animals and cutting for problem vegetation. Other techniques used outdoors included improved sanitation (18 Counties), physical barriers (12 Counties), and biological controls (10 Counties).

Pesticides are used in the pest management programs of every responding County. All but one of the respondent Counties use pesticides indoors and all but two use pesticides outdoors. Scores of different active ingredients are applied at County facilities. (See Appendix 1 for a list of active ingredients applied outdoors, and Appendix 2 for those used indoors.) In all, the Counties used more than 100 different active ingredients in their efforts to manage pest problems.

Most of these pesticides are general use products, available for purchase by the public, over the counter. But a number of the pesticides are classified as "Restricted Use Pesticides" by either the United States Environmental Protection Agency (EPA), the New York State Department of Environmental Conservation (DEC), or both. Restricted Use Pesticides are so classified generally because of their extreme toxicity to humans and other non-target organisms or because of their potential to persist in the environment and/or bioaccumulate. Restricted Use pesticides may only be applied by licensed applicators or by individuals with special permits.

Pest Control Costs

We attempted to gather data on the costs of the Counties' pest control activities. That information was provided by only a few responding Counties, and follow-up inquiries were unsuccessful in

eliciting further response. It appears that there are few records other than contracts with pest control services, and the labor and material costs for applications by County employees could not be reliably approximated. The paucity of cost data is disappointing; discussions about the relative merits of traditional chemical pest control and modern Integrated Pest Management, emphasizing extensive use of non-chemical pest control methods, often focus on concerns about cost-effectiveness.

When Are Pesticides Used

Pesticides may be applied routinely, as a prophylactic measure on a regular schedule, or responsively, only to control a recognized, existing pest problem. As a group, the Counties reported applying pesticides both routinely and responsively. (See Table 3).

Applied	Indoors	Outdoors
Routinely Only	3	13
Responsively Only	12	13
Both	29	17

Pest Control Decisionmaking

Pest control requires a variety of management and operations decisions. These include the broad questions of whether or not to take any action, what action is most appropriate, how it should be implemented, and what precautions should be taken. We explored these issues with a series of questions addressing pest management in general and the specific practices for both indoor and outdoor pest problems. Thirty-one of 45 Counties reported that they have "decentralized" decisionmaking, with different individuals or entities responsible for decisions for specific facilities and/or locations. Although the number of decisionmakers is generally small, some Counties reported the involvement of as many as 16 people. While this could represent a committee approach to decisionmaking, it is clear that this is not always the case.

In those situations where pesticide application is deemed appropriate, the selection of the specific pesticide(s) to be applied is most often delegated to a contractor (see Table 4).

Table 4. Pesticide Selection

Decisionmaker	Indoors	Outdoors
County Employee	1	11
Contractor	28	19
Both	11	13

Forty Counties reported hiring contractors to apply pesticides indoors and 36 used contractors outdoors. Additional applications were made by a variety of County employees. The County, more often than not, controls the timing of pesticide applications when it hires contractors to apply pesticides (see Table 5).

Table 5. Control of Pesticide Application Schedule

Decisionmaker	Indoors	Outdoors
County	33	31
Contractor	7	5

Half of the Counties select pesticide application methods on their own, while the other half leave that decision to their contractor (Table 6).

Table 6. Control of Pesticide Application Methods.

Decisionmaker	Indoors	Outdoors
County	19	21
Contractor	20	15

We asked the Counties to rank various factors (potential health effects, environmental impact, pesticidal efficacy, cost, and availability) that might be considered when selecting a pesticide for use. Table 7 summarizes the Counties response to this inquiry for indoors (7a) and outdoors (7b) pesticide applications. The factors are ranked in decreasing order of importance to the responding Counties.

Table 7. Pesticide Selection Factors.						
a. Indoors:						
	Rank:	1	2	3	4	
5	Factor:					
	Cost	2	1	4	16	20
	Efficacy	8	5	27	2	1
	Health Effects	32	8	2	1	0
	Envir. Impact	1	29	8	3	2
	Availability	1	0	2	21	19
b. Outdoors:						
	Rank:	1	2	3	4	
5	Factor:					
	Cost	2	2	5	18	15
	Efficacy	9	7	22	3	1
	Health Effects	24	10	3	4	1
	Envir. Impact	6	22	7	2	5
	Availability	1	1	5	15	20

Notice of Pesticide Application

Notice of pesticide application may be given before the actual application or may be limited to posting at or after the time of application. Notice may be given only to County employees, or it may also include members of the public who use the facility or may otherwise be exposed to the pesticides in use. Of the 44 Counties that apply pesticides indoors, 37 reported that they provide some pre-application notice. Such notice is given by 24 of the 43 Counties using pesticides outdoors. Tables 8 and 9 summarize the responses of the Counties to questions about prenotification and posting.

Table 8. Pre-Application Notification.

	Indoors	
Outdoors		
TYPE:		
Written	4	5
Verbal	18	7
Both	15	12

TO WHOM GIVEN:		
Employees	37	24
Visitors	12	14

TIMING:		
>72 hrs. advance	4	5
48 - 72 hrs. advance	6	2
12 - 48 hrs. advance	17	10
<12 hrs. advance	15	13

The posting period is variable, with some Counties noting that signs are posted only *during* the application, and one reporting that signs are left in place for a week. Most of those who reported on the period of posting leave the signs in place for a day or two.

	Indoors	
Outdoors		
Yes	18	22
No	26	21

Reentry Restrictions

Regardless of whether the County gives prior notice of a pesticide application or posts the area treated after application, reentry to the treated area may be restricted to minimize the potential for exposure. Reentry restrictions are more likely to be imposed for indoors applications than for outdoors applications (see Table 10). Reentry restrictions are more likely to be imposed by the pesticide applicator or manufacturer than by a County official (see Table 11).

	Indoors	Outdoors
Yes	28	20
No	16	23

Table 11. Source of Reentry Restrictions.

	Indoors	
Outdoors		
Pesticide Applicator	24	18
Pesticide Manufacturer	14	13
Facility Manager	14	7
Health Official	2	0
County Executive	2	0
Other	1	2

Recordkeeping

The majority of Counties reported that they maintain a variety of records relevant to pesticide applications. These include the labels of pesticide products in use, Material Safety Data Sheets (MSDS), and other records of actual pesticide applications. Almost all have these records available for public review (see Table 12).

Table 12. Records Maintained.

	Yes	No
Labels & MSDS	39	6
Pesticides Applied Indoors	31	13
Pesticides Applied Outdoors	32	11
Available to Public	39	6

IV. DISCUSSION

Commonly Selected Pesticides

Many of the active ingredients in the pesticide products used by the Counties can be grouped according to their chemical and toxicological characteristics. Table 13 identifies the groups of pesticides which are most frequently chosen by the Counties for use indoors and outdoors. The groups are ranked by the number of "selections" reported by the Counties (a decision by one County to use the pesticide at two facilities is counted as two "selections"). From the data reported, it was not possible to rank the pesticides by the quantity actually used, nor would such a ranking be very informative without an analysis of actual application rates and frequencies. A quantitative analysis of application rates and frequencies is beyond the scope of our survey.

Table 13. Pesticide Selections Reported.

Class	# Selections Reported		
	Indoors	Outdoors	Total
Organophosphates	55	39	94
Pyrethroids	58	30	88
N-methyl carbamates	26	17	43
Chlorophenoxys	--	33	33
Pyrethrins	24	6	30

Health Effects of Commonly Selected Pesticides¹

The pesticides chosen for use by the Counties provide a wide potential for adverse effects on the health and well-being of those who apply them and those who work, play, reside, or visit at pesticide-treated facilities. Pesticides may move through the environment as vapors, on dusts, and in surface and ground water, thus contributing to exposure of individuals off-site. Exposure of non-target plants and animals may result in adverse effects on those species, beyond any human health impacts.

It is important to recognize the *potential* toxicity of the pesticides that are used by the Counties in their pest management programs. Of course, the actual effects which might arise from exposure to a particular pesticide depend on a wide variety of factors, including actual dose, interactions with other chemical exposures, and individual susceptibilities. While it is beyond the scope of this report to present a complete overview of the toxicity of each pesticide used by the Counties, it is useful to consider brief profiles of the classes of pesticides frequently chosen for use (see Table 13).

Organophosphates

As a group, the organophosphates were most frequently chosen for use by the Counties, and they are probably the most commonly used pesticides in the United States. In other surveys conducted by this office, organophosphates have been found to be frequently selected for use in New York State hospitals and schools and on golf courses on Long Island. This group includes such insecticides as chlorpyrifos, diazinon, acephate and malathion. They affect the nervous system of insects (their target) and mammals (including humans) by disturbing the chemical steps involved in transmitting a nerve impulse. As a result, they cause overstimulation of the nervous system producing a variety of adverse effects. Because all members of this group of poisons act in the same manner, exposures to multiple pesticides would be cumulative in their effects.

Organophosphate poisoning in humans can result in a wide variety of effects on the body. Early symptoms include headache, nausea, and dizziness and may progress to muscular twitching, weakness and tremors, incoordination, vomiting, diarrhea, and visual disturbances. Mental confusion and psychosis may occur, and

ultimately convulsions, coma, respiratory failure, and death may ensue. Repeated exposure to levels of organophosphates too low to cause the acute poisoning described above may still cause persistent anorexia (loss of appetite), weakness, and malaise. In a recent report, patients exposed to professionally-applied chlorpyrifos in their environment suffered a variety of nervous system effects. Several of them experienced memory loss and other mental deficits which persisted for months after exposure.²

Pyrethroids

Pyrethroids are synthetic insecticides, which are chemically similar to the naturally occurring pyrethrins, but are modified to be more stable in the environment. They do not decompose as rapidly as the pyrethrins when exposed to light and heat. While the pyrethroids are generally considered to be "less toxic" choices for insect control, they are nonetheless capable of causing adverse reactions. Among the pyrethroids selected for use by the Counties are cyfluthrin, cypermethrin, and resmethrin. Large doses of these pyrethroids may cause nervous system effects such as incoordination, tremors, vomiting, diarrhea, and irritability to sound and touch. More common than these extreme effects are sensations of stinging, burning, itching, and tingling, which may progress to numbness. Although the pyrethroid-containing products commonly used for non-agricultural applications are general use products, some pyrethroid-containing products are classified as "Restricted Use Pesticides" because of their potential to cause tumors or because of their acute toxicity to applicators.³

N-methyl carbamates

Carbamate insecticides also interfere with the transmission of nerve impulses. In fact, they act by disturbing the same chemical step in normal nerve transmission that is affected by organophosphates, although the carbamate interference is generally of shorter duration. The carbamates include such chemicals as bendiocarb, carbaryl, and propoxur.

The effects of carbamate poisoning are, as might be expected, very similar to those of organophosphate poisoning. General malaise, muscle weakness, dizziness and sweating are common, as are headaches, nausea, vomiting, and diarrhea. In more serious cases, there may be incoordination, blurred vision, slurred speech, labored

breathing, and tightness of the chest. Death can result from the respiratory effects. There is also concern about effects of some carbamates (*e.g.* carbaryl) on the fetus.⁴

Chlorophenoxy

Chlorophenoxy compounds are widely used to kill broadleaf weeds. This group includes such compounds as 2,4-D, dicamba, MCPA, and MCPP. They may be sold as weed killing products or mixed in with fertilizers and are very commonly used on lawns, gardens, and golf courses.

Generally, chlorophenoxy compounds are irritating to the skin, eyes, respiratory system, and digestive system. High doses given to experimental animals have caused vomiting, diarrhea, and toxic injury to the liver, kidneys, and central nervous system, and similar effects have been seen in humans. Muscle stiffness and weakness have been seen to persist for months after human poisoning with chlorophenoxy compounds.⁵

Pyrethrins

The pyrethrins are naturally-occurring substances, extracted from chrysanthemums, which are commonly used as insecticides. Although some people mistakenly equate "natural" with "non-toxic," the pyrethrins are not devoid of toxic effects. They are allergenic and may be a particular problem for asthmatics.

Products containing pyrethrins often also contain organophosphates or n-methyl carbamates to provide for quick "knockdown" of the pest populations. Furthermore, piperonyl butoxide may be added as a synergist, as it may be to organophosphate and n-methyl carbamate insecticide products. Like the pyrethrins, piperonyl butoxide is a naturally occurring substance. Piperonyl butoxide enhances the action of some insecticides, including pyrethrins, organophosphates and carbamates by interfering with the breakdown of the active pesticidal ingredient in the body of the target insect. This same "protection" of active ingredients and concomitant enhancement of toxicity also occurs in humans exposed to both piperonyl butoxide and the appropriate pesticide. Piperonyl butoxide is classified as a Possible Human Carcinogen by EPA.⁵

Carcinogenicity of Pesticides in Use

In addition to the synergist, piperonyl butoxide, 28 of the active ingredients selected for use by the Counties are currently classified by EPA as probable or possible carcinogens (see Table 14).

About two-thirds of these pesticides were reportedly applied outdoors, and the remainder were applied indoors. The list includes some organophosphates, pyrethroids, and n-methyl carbamates.

There is considerable concern and controversy about the carcinogenic potential of some chlorophenoxy compounds (*e.g.* 2,4-D). 2,4,5-T, a related herbicide, was removed from the market by EPA more than a decade ago because of its contamination with dioxins as a by-product of its manufacture. There have been numerous epidemiological studies which have associated exposure to 2,4-D with the incidence of cancer,

and there are others which fail to demonstrate this association. EPA judges the currently available information to be an inadequate basis for any decision on the carcinogenicity of 2,4-D. While this controversy continues, the 2,4-D based products, along with those whose carcinogenicity has been more adequately characterized, remain on the market and are widely selected for use by homeowners, turf managers, and governmental entities.

Table 14. Probable and Possible Carcinogens Used By the Counties.⁶

PROBABLE CARCINOGENS
(EPA Class B1 and B2)

Amitrole
Propoxur (Baygon)
Captan
Chlorothalonil (Daconil)
Fenoxycarb
Iprodione (Promidiaone)
Mancozeb
Oxythioquinox (Morestan)
Vinclozolin

POSSIBLE CARCINOGENS
(EPA Class C)

Acephate (Orthene)
Bayleton (Triadimefon)
Bifenthrin
Bromacil
Carbaryl (Sevin)
Cypermethrin (Barricade)
Dacthal (DCPA)
Dichlobenil
Dicofol (Kelthane)
Hydramethylnon
Oryzalin (Surflan)
Oxadiazon (Ronstar)
Oxyfluorfen
Pendimethalin
Pentachloronitrobenzene (PCNB)
Permethrin
Propiconazole
Tetramethrin
Trifluralin

Pesticide Toxicity - A Supplemental Note

It is both impractical and inappropriate to attempt an exhaustive review of pesticide toxicity in this report. The discussion above focuses on the human health hazards that may be associated with pesticide use. In addition to these there are a wide variety of other adverse impacts, such as the poisoning of non-target species (including desirable plants, insects, birds, and other animals) and the potential contamination of soil, water, and air. The reliance on pesticides involves not only the potential for adverse impacts as a result of their use, but carries with it the associated risks of harm arising from their manufacture, storage, transport and disposal.

Furthermore, it is important to note that our knowledge of the potential health effects of exposure to pesticides is limited. As a matter of policy and practicality, EPA does not require testing of all pesticides for all potential effects. Pesticide products registered only for lawncare are categorized by EPA as terrestrial nonfood use pesticides. As a matter of policy, EPA has determined that exposure to lawncare products does not occur on a routine basis over long periods of time. Therefore, they only require registrants to submit data on the acute effects of such pesticides and they only evaluate the hazards of short term or intermittent exposure.⁷ Pesticides used by the Counties and currently registered by EPA under this limited test requirement include Baygon, DSMA, MCPPP, Siduron, and Trichlorfon.

As a matter of practicality, we can only test for those effects for which there are valid, approved test protocols. Thus, despite the concerns of many, there are no generally accepted tests for the potential impact of pesticides on certain especially sensitive segments of the population (*e.g.* infants and children) or on certain organ systems (*e.g.* the endocrine system). While the Food Quality Protection Act of 1996 mandates that EPA develop appropriate test methods to address these concerns, it establishes a schedule which assures that it will be years until the methods are actually implemented as part of the regular registration process for new pesticides. Additional delays will be involved in reevaluating products already on the market. Even then, the tests will only be required when deemed appropriate by EPA. EPA's policy on lawncare pesticides illustrates how the EPA may waive tests that the general public might assume are routinely required.

Control of Pest Management

The majority of Counties apply pesticides routinely, regardless of whether there is actually a pest which requires control. A total of 32 of 44 responding Counties applied at least some pesticides indoors on a routine basis, while 30 of 43 responding Counties did so outdoors (see Table 3). Routine use of pesticides is generally unnecessary and uneconomical. It reflects a situation in which either the chemicals are not achieving the desired control or are being applied needlessly. While prevention of a pest problem is always better than trying to control a pest problem, there are many alternative ways to prevent the establishment of insects, weeds, rodents or other pests. As discussed later in this report, non-chemical preventative measures can be used to make a location inhospitable for the pest, preventing its establishment and reducing or eliminating the need for any responsive treatments. Pesticides should not be a regular part of a prophylactic program.

When pesticides are used, the Counties generally delegate the selection of specific pesticide products to a contractor. Only one County reported that indoor pesticide selection is a decision that is always made by a County employee, while 39 reported that such decisions are either shared or delegated to a contractor (see Table 4). The majority of the reporting Counties (28 of 40) delegate indoor pesticide selection to contractors.

The Counties exert more direct control over pesticides applied outdoors. Eleven of 43 responding Counties exert sole control over pesticide selection, and 19 Counties delegate this responsibility to a contractor. Thirteen share the responsibility with their contractors (see Table 4).

Although the majority of reporting Counties used contractors to apply pesticides, about half of the Counties reported that at least some pesticide applications are made by County employees. These individuals were described primarily as custodial and maintenance workers, but as holding a wide variety of job titles, including "highway staff," "working foreman," and "grounds crew." In a few of these cases the employee was identified as a certified pesticide applicator, but in many cases, it is not clear that the County employee was certified. Under New York State law, all "commercial" pesticide applications must be performed by or "under the direct supervision of" a certified applicator.⁸ Pesticide applications to County-owned or

maintained property are "commercial" applications,⁹ thus requiring DEC certification of the employee actually applying the pesticides or of the individual supervising the work. DEC certification for commercial applicators requires at least three years of commercial application experience under the supervision of a certified applicator, completion of a training program and successful completion of a DEC administered examination.¹⁰ Furthermore, Counties using their own personnel to apply pesticides must also register with DEC as a "pesticide agency".¹¹ The Counties should carefully examine their pest management practices to assure compliance with this requirement. Proper training and adequate experience is necessary for the success of any pest control program, but is absolutely critical in those instances when pesticides are used.

For both indoor and outdoor applications, "health effects" was most frequently rated as the most important criterion for pesticide selection by the Counties. "Environmental impacts" was widely chosen as the second most important factor, followed by pesticide efficacy. The Counties generally ranked cost as one of the least important factors considered (Table 7).

County governments should take an active and leading role in pesticide selection. While the contractor may provide useful and important information about available pest management options, it should be the County's responsibility to make the final decision, weighing in the larger questions of health and environmental impacts, potential liability (current and future) and responsiveness to those who may be exposed or otherwise impacted by pesticide use.

As seen in Table 5, the Counties take an active role in timing pesticide applications, with more than 75% of the respondents retaining control of the application schedule. However, given the fact that most Counties indulge in routine pesticide applications, this apparent control of the schedule may merely reflect a contractual schedule of applications rather than a site or incident-specific decision to apply pesticides. Contracts may specify that pesticides should be applied, for example, after the end of business hours or at the end of the work week. It is encouraging that even this level of control reflects a concern about the potential for exposure to pesticides and resulting adverse impacts. The Counties should build upon this concern, adopting a full range of policies and practices which will control pests while reducing, as much as possible, the health and environmental risks associated with pest control.

The Public's Right To Know

Given the potential for adverse impacts on human health and welfare, and on the environment, it is important for the public to be fully informed about pesticide use by their local governments. If pesticides are used, all individuals who might be exposed should receive adequate warning, and all citizens should have access to appropriate information about the chemicals in use.

One obvious way to minimize the potential adverse effects of exposure to pesticides is to limit the opportunities for exposure. This may be accomplished by pre-application notification to those who regularly frequent the site to be treated, by posting notices around areas which have been treated, or by actually restricting access to treated areas for some period of time after pesticide application. Pre-application notification provides the opportunity for individuals to take whatever precautions they consider appropriate, such as avoiding the area during and after pesticide application, removing or protecting personal property kept in the workplace, or taking other voluntary steps to minimize exposures. Notices posted at the time of application serve as a reminder to those who may have received pre-application notification and as notice to people who may have not received the pre-application notification either because they were absent from the site or because they are only periodic visitors to the treated location. This is especially important in the case of County facilities, many of which are maintained for the use and enjoyment of the general public.

More than 75% of the Counties reported that they provide some sort of pre-application notification for indoor pesticide use, while only slightly more than half provide such notice for outdoor applications. The notice is frequently verbal (see Table 8) and is generally given no more than two days prior to application. About one third of the Counties provide less than 12 hours advance notice of pesticide applications. As might be anticipated, County employees are notified more frequently than the general public, especially when indoor applications are considered.

Post-application notices were more likely to be posted for outdoor applications than for indoor applications. Even outdoors, however, notices were posted by only half of the responding Counties. Under New York State Environmental Conservation Law, County governments as well as other agencies, are required to post visual notification of pesticide applications to the ground, trees or shrubs if

the application is made within 100 feet of a dwelling, multiple dwelling, public building or public park.¹² Clearly, while County governments *must* post under those circumstances, nothing precludes them from posting for all pesticide applications.

While there are certainly some instances in which Counties provide timely and effective notice to all appropriate segments of the population, the general picture painted by the responses to our survey shows that substantial room for improvement exists. Written notice distributed well in advance of pesticide applications should be supplemented by post-application notices to inform those who may still be unaware of the scheduled application.

Restrictions on reentry to the treated area complement informational pre- and post-application notices. Such restrictions can provide protection for those who might not be able to read or understand the written notices, or who might otherwise subject themselves to unnecessary pesticide exposure. Reentry restrictions were observed by almost two-thirds of the responding Counties for indoor applications and by less than half for outdoor applications (see Table 10). In the majority of these instances, the restriction was reported to be imposed by the pesticide manufacturer or applicator (see Table 11). Since all pesticide applications must be made in accordance with label instructions, it is not clear whether applicators were suggesting additional restrictions or were simply communicating the restrictions stated on the product label. Certainly, there must be some instances in which professional applicators recommend precautions beyond those listed on the label. Nevertheless, County governments are free to impose reentry restrictions after pesticide applications at their own facilities, which may supplement or enhance those required by the label directions, to protect workers and the general public.

Finally, County employees and the general public have a right to know about the pesticides applied at County facilities - not simply their identity, but also their composition, their potential to cause adverse health and environmental effects, and the appropriate precautionary steps which should be taken during and after application. Much of this information is available, at least in summary form, on the pesticide labels and on Material Safety Data Sheets (MSDS) prepared by the manufacturer. These documents should be maintained by the County government and available for review by employees and the public. In fact, New York State Environmental Conservation Law requires that copies of pesticide label information, including all warnings, must be available to the occupants or residents

of buildings in which a certified pesticide applicator applies pesticides.¹³ Specifically, the applicator must provide the information to the building owner or his agent prior to application. The owner/agent, in turn, must make the information available upon request to the building occupants or residents. Almost all of the Counties reported that they maintain such files of labels and MSDS, and about 75% of the Counties keep records of applications, indoors and out. In at least one case it appears that the County relies on files maintained by an independent contractor. This practice is deficient because the contractor may have no continuing obligation to the County or its residents once the contract has expired. The value of these records, including their utility in assessing the efficacy of treatments or resolving questions about possible exposure and adverse effects, extends well beyond the scope of annual pest control contracts.

Pest Control Policy

Clear and unambiguous pest control policies are essential to the establishment and continued success of an effective pest management program. Written guidance and policy will further enhance the protection of human health and the environment, which should be a central concern of County government. Policies can specify a pest management strategy or the criteria by which the strategy will be developed. Authority over the pest management program should be clearly defined and centralized. Decisions should be based on a full understanding of the pests and the management options available for their control. Adequate public notification practices should be instituted and recordkeeping procedures, with public access assured, should be established.

As a matter of policy, County governments can, and should, adopt Integrated Pest Management (IPM). IPM is a knowledge-based approach to pest control, not an alternative to any particular control method. It requires an understanding of the biology of the pest, its needs and habits. IPM employs a variety of pest control methods, and in doing so, it not only controls the pest, but minimizes the potential for adverse effects on human health and the environment. Such adverse effects might be associated with both pests and the methods we use to control them. As an additional benefit, as IPM programs are implemented and the reliance on chemical pesticides reduced or eliminated, some of the other burdens on the County (posting, notification, access restrictions, and some recordkeeping) may also be reduced and eliminated. With reduced potential for adverse effects, issues of liability for adverse impacts will also be reduced.

In practical terms, IPM is based upon regular inspections, accurate identification of pests, and the specific area that is actually infested. Efforts are focused on preventing pest problems by eliminating pest habitat, and access to food, water, shelter, and other essential needs of the pest. Tolerance levels should be established for each pest in each specific location or situation. Zero tolerance, while appropriate in some situations, may not be necessary in all instances. When pests exceed the tolerance level, IPM relies on a response with physical, mechanical, and biological controls before chemical controls are used. When, and if, chemical control measures become necessary, IPM programs weigh the toxicity and exposure potential associated with the chemicals which are available, and select those which minimize the potential for adverse impacts.

It was disappointing to find that only nine of the 45 responding Counties have written policies addressing their pest management programs. Among those submitting documentation, Nassau and Westchester Counties have fairly detailed policies, but implementation is still in the early stages in both Counties. Nevertheless, their programs may serve as useful models for other Counties.

Nassau County is guided by an Executive Order (No. 1-1995) which mandates implementation of a "Nassau County Pesticide Policy" prepared by the County Department of Health. The Order mandates efforts to minimize reliance on "the use of formulated organic chemical pest controls" and directs that pest control contracts specify the use of Integrated Pest Management techniques. A standardized and detailed purchase order form has been prepared that sets forth the criteria for the selection of pest management methods, basic requirements for inspection and monitoring, as well as reporting and recordkeeping. A Pesticide Advisory Committee, composed of representatives from County agencies, the pest control industry, and the general public, has been established. The Order further commits the County to promote the use of alternatives to pesticides to all residential, commercial, and industrial sectors in the County.

Westchester County has passed a local law (Local Law No. 16 of 1995, Chapter 690 of the Laws of Westchester County) intended to promote "pest control strategies which are the least hazardous to human health and the environment and adopt an integrated pest management program which places first priority on the prevention of pest problems and uses chemical pesticides as a last resort only." The law establishes a Pest Management Committee which is charged with developing guidelines and programs for pest control, record keeping, and educational outreach to the citizens of the County on pest control

matters. Under the law, the County is obligated to provide the public with 48 hours advanced notice of pesticide applications on County property and to maintain records of such applications for at least three years.

It will take time to fully implement, refine and assess the programs now being developed by Nassau, Westchester and other localities in New York State. But other Counties need not wait for the final analysis to initiate their own efforts. Table 15 outlines a stepwise approach that can lead Counties through the development of their own IPM programs.

Table 15. Seven Steps To Establishing An Integrated Pest Management Program.¹⁴

1. Develop an IPM policy statement which not only establishes a commitment to IPM, but which guides pest managers to developing specific action plans.
2. Designate pest management roles for occupants, pest managers and key decision makers; provide for education and training and assure good communications.
3. Set site-specific pest management objectives for each location.
4. Inspect each location; identify and monitor pest populations for potential problems.
5. Set action thresholds - levels of pest populations or site conditions that require remedial action.
6. Apply IPM strategies to control pests.
7. Evaluate results to assure that pest management objectives are met; keep written records.

Integrated Pest Management is not a new or experimental program. Successful IPM programs have already been implemented and proven successful in many kinds of Federal, State, local and private facilities nationwide. The County programs described above can serve as useful starting points for those Counties seeking to develop a program of their own.

Almost every County that responded to our survey indicated that they use the services of a pest control contractor to some extent. Therefore, it is important that the Counties clearly communicate their policies not only to their own

employees, but to their contractors. As with any purchasing activity, the Counties should exercise caution in selecting a contractor to implement an IPM program. The County should have a clear vision of what it wants and choose a contractor with the training, experience and equipment needed to deliver it. The services offered by contractors as "integrated pest management" may not coincide with the County's preferences. Therefore, bid proposals and contracts

should clearly state the nature and extent of the services to be provided. The division of responsibility between the County and its contractor should be unambiguously defined. Contracts should include performance standards based on the elimination or control of infestations to tolerable levels, and not upon the number of pesticide applications.

Counties should contract for regular inspections, pest identification, and infestation evaluations. This, and not pesticide application, is the heart of Integrated Pest Management. Whenever possible, inspections should be conducted during normal working hours. At that time, the pest control technician will be able to observe typical working conditions and habits and to communicate freely with those who use the facility. Visits during regular working hours will help to discourage the reliance on sprays, fogs and area-wide treatments. Furthermore, we recommend that contracts require that a certified applicator be present whenever pesticides are applied. Although it is legal for uncertified individuals to apply pesticides under the supervision of a certified applicator, the supervising applicator is not always required to be at the location at the time of application. Counties should opt for the added security of allowing only fully trained and certified individuals to apply pesticides. On-site pest management personnel should be fully trained to accurately identify pests, evaluate infestations, prescribe remedial and responsive actions, and minimize the potential for accidents or misapplications.

Pest management contracts should be clear in their intent to minimize the reliance upon routine application of pesticides while maximizing the use of other preventive and responsive measures. Specific protocols for approval of any chemical application should be established, with decisions based first on the failure of other control methods, and then on an evaluation of the various chemical options available, their toxicity, their potential for unwanted exposure and adverse impacts, and their demonstrated efficacy for the proposed application.

It is curious that those hesitant to change pest management practices and to implement an IPM program, often cite anticipated increased costs as a deterring factor. This should clearly not be the case for the County governments. In response to our inquiry about the factors which govern the selection of pesticides, cost was generally assigned a low ranking, well behind health and environmental effects and efficacy (See Table 7). If this same set of criteria were applied to the selection of a pest control strategy, rather than selection of pesticides, then IPM would be selected, regardless

of costs. Furthermore, Counties were generally unable to provide us with any meaningful information on the cost of their current pest management efforts, revealing an apparent insensitivity of pest control programs to cost considerations. This also means that there is a lack of any meaningful data upon which the cost effectiveness of IPM could be evaluated. While the transition to IPM may involve some upfront cost increases, the long-term control obtained, and reduced potential for adverse effects and their associated liabilities, are likely to provide for cost reduction and stability.

In Closing...

By virtue of their size and their proximity to the population they serve, County governments are in a position to act affirmatively and to take a leadership role as agents of change in the way we manage pests. Because of the diverse pest problems they must address, County governments can serve as an example for local residents and businesses, as well as the towns and villages within their boundaries. By implementing Integrated Pest Management programs specific to local needs, County governments can contribute to the health and well being of their constituents, protect and preserve the local environment, and help to "make the market" for Integrated Pest Management.

The first step in this process is recognition of the full scope of issues involved in pest management and the alternative means by which they can be addressed. This report highlights some of the issues which should be considered, including policy and decisionmaking functions, selection of pest management techniques, scheduling of pest management activities, public notice, and recordkeeping.

Given the diversity of pest management problems and organizational issues facing Counties, it would be naive to attempt to offer a uniform recipe for pest control by County governments. We can, however, discuss the menu and make suggestions on appropriate selections. County governments can use this as a departure point for their own efforts:

- ? *Centralize pest management.*
- ? *Involve local citizens and businesses in the planning and implementation of policies.*
- ? *Minimize the potential for adverse health and environmental impacts*

? *Seek the assistance and support of County health officials*

? *Use the resources of local colleges and universities*

Through the implementation of IPM, the Counties can be agents of change. Instead of killing pests, prevent them. Instead of posting warnings about chemical applications, publicize the success of efforts to reduce or eliminate their use. Instead of restricting access to public facilities, maximize their utility. The means to accomplish these ends are available; all that is required is the will to make them work.

ENDNOTES:

¹ Unless otherwise specified, the information on the toxicity of pesticides is based upon information reported by EPA in *Recognition and Management of Pesticide Poisonings, Fourth Edition* EPA-540/9-88-001, March 1989.

² Kaplan, J.G. et al. "*Sensory neuropathy associated with Dursban (chlorpyrifos) exposure*" *Neurology* 43:2193 - 2196, 1993.

³ For example, cypermethrin formulations are restricted because they can cause tumors, and cyfluthrin formulations are restricted because of their acute toxicity to applicators. *EPA Pesticide Information Network: Report of the Restricted Use Product file with Revision Date Before 4/2/97*

⁴ NJ Department of Health, Environmental Health Service, *New Jersey Pesticide Resource Manual For Health Professionals*. 1992.

⁵ EPA Office of Pesticide Programs List of Chemicals Evaluated for Carcinogenic Potential, February 19, 1997. (Memo from William L. Burnham, Chief - Science Analysis Branch, Health Effects Division to numerous recipients.)

⁶ *Ibid.*

⁷ United States Environmental Protection Agency, *Questions and Answers on Lawn Pesticides* (Retrieved May 22, 1997 from: <http://pmep.cce.cornell.edu/issues/lawnissues>)

⁸ New York State Environmental Conservation Law §33-0905(1); 6 NYCRR §325.17 and §325, Appendix 8-C.

⁹ New York State Environmental Conservation Law §33-0101(11).

¹⁰ 6 NYCRR §§325.17 - 325.21

¹¹ New York State Environmental Conservation Law §33-0907.

¹² New York State Environmental Conservation Law §33-1003, and specific requirements applicable to Counties under §33-0101(46).

¹³ New York State Environmental Conservation Law §33-0905(5).

¹⁴ Adapted from: United States Environmental Protection Agency, Office of Pesticide Programs, "*Pest Control in the School Environment: Adopting Integrated Pest Management.*" EPA 735-F-93-012, August, 1993.

CREDITS: This report was prepared by Michael H. Surgan, Ph.D., Chief Scientist, Environmental Protection Bureau. Patricia Oranges provided substantial support throughout this project, from preparation of the questionnaire through follow-up contacts with the Counties and data management. Jennifer Selfridge and Marina Rabinovich provided valuable assistance in data entry and management.

APPENDIX 1: Active Ingredients in Pesticide Products Used by Counties - Outdoors

2,4-D (and salts)	Hexazinone
4-Aminopyridine (Avitrol)	Imidacloprid
Acephate (Orthene)	Insecticidal soaps
Acetic Acid	Iprodione (Promidione)
Allethrin (d/l-trans-allethrin)	Isobutane
Aluminum Tris (Aluminum tristearate)	Isofenphos (Oftanol)
Amitrole	Isovaleral (Calcium salt)
Anilazine (Dyrene)	Malathion
Baygon (Propoxur)	Mancozeb
Bendiocarb (Ficam)	MCPA (2-methyl-4-chlorophenoxyacetic acid)
Benfluralin (Balan)	Mecoprop (MCP, CMPP)
Bensulide	Mefluidide (Embark)
Boric Acid (Orthoboric Acid)	Metalaxyl
Brodifacoum (Talon)	MSMA (Monosodium methanearsonate)
Bromacil	Methoprene
Bromadiolone (Maki)	Metsulfuron-methyl
Captan	Oils - Horticultural, Mineral
Carbaryl (Sevin)	Oryzalin (Surflan)
Chloroneb	Oxadiazon (Ronstar)
Chlorothalonil (Daconil)	Oxyfluorfen
Chlorpyrifos (Dursban)	Oxythioquinox (Morestan)
Copper Sulfate	Paraquat
Cyfluthrin	Pendimethalin
Cypermethrin (Barricade)	Pentachloronitrobenzene (PCNB)
Dacthal (DCPA)	Phenothrin
Diazinon	Phenyl Methylcarbamate
Dicamba (Banvel)	Piperonyl Butoxide (PBO, a synergist)
Dicarboximides	Prometon (Pramitol)
Dichlobenil	Propamocarb Hydrochloride
Dichlorvos (DDVP)	Propiconazole
Diphacinone	Pyrethrins
Disulfoton	Quaternary Ammonium Compounds (Barquat, Bio-quat)
Dithianone	Resmethrin
Dithiopyr	Siduron (Tupersan)
Diuron (Karmex)	Sulfometuron-methyl
DSMA (Disodium monomethanearsonate)	Tetramethrin
Ethion	Thiophanate-methyl
Ethylene Glycol	Triadimefon (Bayleton)
Ethylene Oxide	Trichlorfon (Dylox)
Etridiazole	Triclopyr (Garlon)
Fenarimol (Rubigan)	Trifluralin
Fenbutatin-oxide	Triforine
Fenoxaprop-ethyl	Vinclozolin
Fosamine ammonium	Zinc Phosphide
Fosetyl-aluminum	
Glufosinate-ammonium	
Glyphosate	

APPENDIX 2: Active Ingredients in Pesticide Products Used by Counties - Indoors

Acephate (Orthene)	Fenvalerate
Allethrin (d/l-trans-allethrin)	Ferbam (Carbamate)
Avermectin (Abamectin)	Fluvalinate (Mavrik)
Baygon (Propoxur)	Glutaraldehyde
Bendiocarb (Ficam)	Glyphosate
Bifenthrin	Hydramethylnon
Boric Acid (Orthoboric Acid)	Hydroprene
Brodifacoum (Talon)	Malathion
Bromadiolone (Maki)	Metalaxyl
Calcium Silicate	Methoprene
Chlorpyrifos (Dursban)	Oxydemeton-Methyl
Cholecalciferol	Permethrin
Cyfluthrin	Phenyl Methylcarbamate
Cypermethrin (Barricade)	Piperonyl Butoxide (PBO, a synergist)
Diatomaceous Earth (Infusoral Earth)	Propetamphos (Safrotin)
Diazinon	Pyrethrins
Dicarboximides	Pyrethroids
Dicofol (Kelthane)	Resmethrin
Diphacinone	Silica gel
D-Phenothrin	Sulfluramid
Endosulfan (Thiodan)	Tetramethrin
Esfenvalerate	Tralomethrin
Fenoxycarb	Zinc Phosphide

APPENDIX 3: Some Sources of Information About Integrated Pest Management

1. Olkowski, W., S. Daar and H. Olkowski "Common Sense Pest Control." The Taunton Press, Newton, Conn., 1991, xix + 715 pp. (This book is encyclopedic in its coverage of pests and pest control methods. It provides practical and easy-to-understand guidance.)
2. Schultz, W. "The Chemical-Free Lawn." Rodale Press, Emmaus, Pa., 1989, xi + 194 pp. (A straightforward guide to lawn establishment and maintenance without pesticides.)
3. New York State Office of General Services, Division of Technical Services, "Modern Pest Control Techniques Handbook (A Generalist's Guide to Integrated Pest Management)" May 1992, 23 pp. (This monograph is intended for those responsible for the management of pest control contractors. It discusses IPM techniques as well as contracting for services.)
4. New York State Office of General Services, Division of Technical Services, "Specification - Pest Control Through Integrated Pest Management - January 5, 1993." (These contract specifications are intended to provide a comprehensive IPM program for State buildings and should be useful to County administrators using an outside contractor.)
5. Illinois Department of Public Health, "Integrated Management of Structural Pests in Schools - 1994." 21 pp. (A guide for developing IPM programs for schools. It provides guidance which can be applied to other settings. Contact the Division of Environmental Health at 217-782-5830 to obtain a copy.)
6. United States Environmental Protection Agency, Office of Pesticide Programs, "Pest Control in the School Environment: Adopting Integrated Pest Management." EPA 735-F-93-012, August, 1993, ii + 43 pp. (Designed to acquaint readers with IPM, this brochure identifies ways to reduce dependence on pesticides. The principles discussed are applicable to a wide variety of structural and outdoors pest control needs. Contact the USEPA Public Information Center, 401 M Street SW, Washington, DC 20460 for a copy.)
7. Contact organizations such as:
 - New York Coalition for Alternatives to Pesticides
353 Hamilton Street
Albany, N.Y. 12210-1709
(518) 426-8246

 - Bio-Integral Resource Center
P.O. Box 7414
Berkeley, CA 94707
(510) 524-8404

 - Cornell University IPM Program
New York State Agricultural Experiment Station
Geneva, N.Y. 14456
(315) 787-2353 (or Contact your local Cooperative Extension Office.)

APPENDIX 4: Albany County “Pesticide Sunset” Ordinance

Adopted unanimously by Albany County Legislature
May 11, 1998

RESOLUTION NO. 46-a

PROVIDING FOR INCREASED PROTECTION FOR PUBLIC HEALTH AND THE ENVIRONMENT FROM EXPOSURE TO DANGEROUS PESTICIDES

Introduced: 5/11/98

By Messrs. Richardson, Darbyshire, Ms. Springer, Public Works and Conservation and Improvement Committees:

WHEREAS, In consideration of the potential hazards associated in the use of pesticides, the Albany County Legislature deems it necessary to employ pest control strategies that are the least hazardous to human health and the environment and adopt an integrated pest management program that places first priority on utilization of best management practices and the use of pesticides as a last resort, and

WHEREAS, There is a national effort to reduce and eventually eliminate the use by local governments of pesticides hazardous to human health and the environment, and

WHEREAS, The City of Albany is currently considering legislation similar to this resolution, and

WHEREAS, It is the responsibility of Albany County to ensure the health and safety of all it's citizens, now, therefore be it

RESOLVED, That for the purpose of this resolution the term “pest” shall mean and refer to any insect, rodent, fungus, weed, virus, bacteria, or other micro-organism (except viruses, bacteria or other micro-organisms on or in living persons or other living animals), that the Commissioner of the New York State Department of Environmental Conservation declares to be a pest, and, be it further

RESOLVED, That for the purpose of this resolution the term “pesticide” shall mean and refer to any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest and any substance or mixture of substances intended for use as a plant regulator, defoliator or desiccant registered as such by the United States Environmental Protection Agency and/or the New York State Department of Environmental Conservation and all such products for which experimental use permits and provisional registrations have been granted by the United States Environmental Protection Agency and/or the New York State Department of Environmental Conservation, and, be it further

RESOLVED, That for the purpose of this resolution the term “anti-microbial pesticide” shall

mean and refer to a pesticide as defined by 7 U.S.C. 136(mm), and, be it further

RESOLVED, That notwithstanding any other provisions, this resolution shall not apply to the following:

Pesticides used for the purpose of maintaining a safe drinking water supply at drinking water treatment plants, wastewater treatment plants, reservoirs, and related collection, distribution, and treatment facilities;

Anti-microbial pesticides;

Pesticides in contained baits for the purposes of rodent control; and

Pesticides classified by the United States Environmental Protection Agency as exempt materials under 40 CFR 152.25;

and, be it further

RESOLVED, That effective September 1, 1998, no County department or any pesticide applicator employed by Albany County as a contractor or subcontractor for pest control purposes shall apply on property owned or operated by Albany County any pesticide classified as Toxicity Category I by the United States Environmental Protection Agency, or any pesticide classified as a known, likely, or probable human carcinogen by the United States Environmental protection Agency, except as otherwise provided for in the eighth and ninth resolved clauses of this resolution, and, be it further

RESOLVED, That the Albany County Legislature hereby establishes a Pest Management Committee with the power to develop an Integrated Pest Management Plan to be adopted by the Albany County Legislature and to monitor pest management procedures for property owned or operated by Albany County. Said Committee shall be made up of one person from each of the following County departments and organizations: Department of General Services; Department of Health; Department of Public Works; Department of Residential Health Care Facilities; Sheriff's Department; Albany County Soil and Water Conservation District; and Cornell Cooperative extension; and, in addition, one person designated by the Albany County Executive representing a cancer prevention advocacy organization, one person designated by the Albany County Executive representing an alternatives to pesticides advocacy organization, and one person designated by the Albany County Executive representing a general public interest advocacy organization, and, be it further

RESOLVED, That on or before January 1, 1999, the Albany County Pest Management Committee shall develop an Integrated Pest Management Plan for review and approval by the Albany County Legislature. The plan shall be consistent with the provisions of this resolution. The plan shall have specific provisions for effectively managing pest problems in a comprehensive manner, including, but not limited to:

Identification of all pest management methods or strategies used by County departments and pesticide applicators employed by Albany County as a contractor or subcontractor for pest

control purposes on property owned or operated by Albany County;

Procedures for least toxic pest control for the period prior to September 1, 2000;
Procedures for non-pesticide pest control for the period after September 1, 2000 except as otherwise provided for in the eighth and ninth resolved clauses of this resolution;

Procedures for monitoring the implementation of the Integrated Pest Management Plan;

Procedures for monitoring pest populations on property owned or operated by Albany County;

Education and training of County personnel on non-pesticide pest control methods and strategies;

Procedures for record keeping; and

Procedures and guidelines for decision making,

and, be it further

RESOLVED, That should the Albany County Commissioner of Health determine that a human health emergency warrants the use of a pesticide that would otherwise not be allowed under this resolution, the Commissioner of Health shall have the authority to issue an exception based on the following criteria;

The pest situation poses an immediate threat to human health;

Viable alternatives consistent with this resolution do not exist;

Any pesticide used must have the least acute and chronic toxic effect on human health of all available choices; and

Underlying causes of the pest outbreak are addressed in order to prevent future outbreaks,

and, be it further

RESOLVED, That should the Albany County Pest Management Committee determine that an emergency other than a human health emergency warrants the use of a pesticide that would otherwise not be allowed under this resolution, the Albany County Pest Management Committee shall have the authority to issue an exemption based on the following criteria:

Viable alternatives consistent with this resolution do not exist;

Any pesticide used must have the least acute and chronic toxic effect on human health of all available choices; and

Underlying causes of the pest outbreak are addressed in order to prevent future outbreaks,
and, be it further

RESOLVED, That should pesticides be used pursuant to the eighth or ninth resolved clause of this resolution, the entity engaged in such application shall conspicuously post as soon as practicable in advance of the actual application, at the site of application the following information: 1) date of posting; 2) organism targeted; 3) specific location, date, and approximate time of application; 4) method of application; 5) trade name and the active ingredient of the pesticide used; 6) copy of the label; 7) name and telephone number of the person responsible for the application; and 8) poison control telephone number, and, be it further

RESOLVED, That any plan for new construction or remodeling of buildings owned or operated by Albany County, plans for designing or redesigning public parks and recreation areas owned or operated by Albany County, and plans for landscaping of buildings owned or operated by Albany County contain provisions for the prevention of pest problems by means such as appropriate structural design, pest resistant vegetation, and pest control maintenance and planting practices, and, be it further

RESOLVED, That the Clerk of the County Legislature is directed to forward certified copies of this resolution to the appropriate County Officials.

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Pest Management By The Counties:

A Call For Change



Dennis C. Vacco

Attorney General of New York State

New York State Department of Law

August 1997

