INTEGRATED PEST MANAGEMENT (IPM) IN NEW JERSEY SCHOOLS

A PILOT PROJECT IN COOPERATION WITH HUDSON AND ESSEX COUNTIES

NJ Department of Environmental Protection
Pesticide Control Program

September 2003

Integrated Pest Management (IPM) Project in Schools

September, 2003 – Ann R. Waters and Tim Boyle

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Ann R. Waters
School IPM Coordinator
Public Outreach and Training Coordinator
NJ Department of Environmental Protection
Pesticide Control Program
PO Box 411
Trenton, NJ 08625-0411

Phone: (609) 984-5014
Fax: (609) 984-6555
Ann.Waters@dep.state.nj.us

Tim Boyle
IPM Coordinator
NJ Department of Environmental Protection
Pesticide Control Program
PO Box 411
Trenton, NJ 08625-0411

Phone: (609) 984-6908
Fax: (609) 984-6555
Tim.Boyle@dep.state.nj.us

http://pcpnj.org

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- Jean C. Walker, Chief Enforcement Officer, Essex Regional Health Commission
- Joseph Farinella, Environmental Specialist, Essex Regional Health Commission
- The Administration and staff of the East Orange, Cedar Grove and South Orange/Maplewood school districts in Essex County
- The Administration and staff of PS #31 in Jersey City, Robert Fulton School in North Bergen and the staff of the Busy Place Day Care in Jersey City, all in Hudson County

Purpose

The Integrated Pest Management (IPM) project in schools was designed as a pilot project in New Jersey for the purposes of educating the participating schools on IPM principles in preparation for a future State mandate. Upon completion of the project, an analysis between conventional pest management practices and the alternative methods involved in IPM will be examined to determine changes in pesticide usage, cost of implementing IPM vs. a conventional approach, as well as the reduction of potential risk to pesticide exposure. The project was administered by the New Jersey Department of Environmental Protection's Pesticide Control Program in cooperation with County health officers participating in the County Environmental Health Act (CEHA) program.

Goals and Objectives

- Educate all individuals involved in a school setting about the alternative methods of pest control known as Integrated Pest Management (IPM)

- Implement an IPM program for the purpose of reducing the potential risks to pesticide exposure in a school setting, through the joint efforts of school personnel, County Officials and NJDEP-Pesticide Control Program staff

- Analyze pest management practices prior to, during and upon completion of the project, for the purpose of reporting changes in pesticide usage as a result of the implementation of an IPM program

- Develop IPM programs for other schools throughout New Jersey based on the Essex and Hudson pilot program

Project Duration

October 1, 2001 through June 30, 2003

Participating facilities

Schools

- PS #31, Jersey City – Hudson County
- Robert Fulton School, North Bergen – Hudson County
- Cedar Grove School District – Essex County
- East Orange School District – Essex County
- South Orange/Maplewood School District – Essex County

Day Care facility

- Busy Place Day Care, Jersey City – Hudson County

Implementation

- NJDEP-Pesticide Control Program (PCP) will assist in training county officials in the fundamentals of IPM, including established minimum criteria, as well as providing all necessary forms for documentation and reporting

- County officials and participating school staff involved with facility pest control should receive additional training by attendance at the IPM in Schools short course sponsored by Rutgers University Office of Continuing Professional Education

- Distribution of IPM materials to school personnel

- Upon selection of participating school(s), a meeting with school officials, County staff and PCP staff will be necessary to discuss:
  - The scope of the IPM project
  - Implementation timetable to be adhered to
  - County officials' project responsibilities in cooperation with the participating school

- An assessment of current and previous pest management practices, will be accomplished through an examination of existing records

- Upon implementation of the IPM program, the county will follow an agreed upon timetable for monitoring the schools' activities and participating pest control business practices with the project objectives

- County officials will communicate with NJDEP-PCP throughout the course of the project to assess its' progress

- Upon completion of the project, final written reports will be made to PCP

- Officials involved in the project will provide a comprehensive project overview in the form of a seminar for other health officials

Deliverables

- Through inspection of pest management records, an **initial assessment** of current and past practices (minimum 2 years) will be documented. Information to be provided will include:
  - Pest management policies
  - Identification of person or persons involved in pest control within the school environment (in-house or professional outside contractor)
  - Current and past pest problems as well as the methods involved in their control
  - Locations of pest problems
  - Specific types and total amounts of pesticides used
  - Frequency of applications
  - Annual cost to school for pest management services, including costs associated with in-house pest control involving pesticide purchases as well as staff training related expenses
  - Health related complaints following pesticide applications available from school nurse records or other documentation

- **Routine monitoring visits** documented by County personnel, with monthly reports provided to PCP which will include:
  - Examination of pest management records for IPM practices to ensure compliance with the project
  - Trends in pest populations and methods involved in control
  - Frequency of pesticide applications
  - Other records as noted in initial inspection as available
  - Appropriate participation of all parties involved
  - Problems observed
  - Any structural or physical deficiencies

- **Final report** to be submitted to PCP within one month of completion of project to include, but not limited to:
  - Pest populations-types eliminated or reduced as well as amounts
  - Comparison of conventional vs. IPM pest control program involving the following:
    - Impact on chemical controls including changes in usage amounts as well as types of products and procedures used
    - Monetary cost factors involved in implementation, including structural improvements needed
    - Changes noted in human health impacts
  - Success in implementation of IPM pest control program
  - Recommendations for improvement

Criteria for School Selection

It was decided between the Pesticide Control Program and the CEHA parties that the County Health officials would determine which schools would be participants in the IPM school pilot projects in their respective counties. To assist them, a series of questions relating to the specifics of pest management within their individual schools was developed. These criteria in survey format can be found as **Appendix A** at the end of this report.

Hudson County

North Bergen and Jersey City school districts were contacted to explain the IPM pilot project and ask for their involvement in the project. Both districts decided to make the decision as to which schools should be involved in the program. Robert Fulton in North Bergen was chosen due to roach problems. PS #31 in Jersey City was chosen due to mice problems. Busy Place Day Care in Jersey City is a private day care. The site had been previously inspected for compliance with the pesticide regulations. The owner of the day care mentioned she had many issues with the owner of the building and hoped her involvement in IPM would stir the owner to make some changes.

Essex County

Essex Regional Health Commission through letters and phone calls to various municipalities identified three school districts which represented a cross-section of the county's demographics as well as other pest management issues. Those school districts were East Orange, South Orange/Maplewood and Cedar Grove.

Project Outcomes

Essex County

In the final phase of the NJDEP Pilot Project for Integrated Pest Management in Schools, the Essex Regional Health Commission (ERHC) proceeded on two fronts: training and records retrieval/analysis. On April 14, 2002, the NJDEP Pesticides Program personnel presented to the NJ School Buildings and Grounds Association Central Chapter at their regular meeting.

ERHC requested application records from Pest Control contractors for two school systems for the years 2000-2001 and 2001-2002. Initial requests were not met and the records were ultimately obtained via assistance from NJDEP Pesticides Program personnel correspondence. Analysis of the records reflected a clear benefit to the school systems where IPM was being employed, specifically:

Cedar Grove – IPM is in place. There is a reliance on mechanical controls (traps, glue boards) and the inspection and maintenance thereof, as well as spot-application of baits and gels. Pest sightings are relatively minimal. There were 36 site visits and 7 pest sightings. **(Appendix B)**

East Orange – Oct '00 – Jun '01: During this time, the pest control contract specified "all areas treated 2x per month, no exceptions". As can be seen by the data tables associated with this report, the contract was being upheld by the contractor and fumigation and fan spraying was

taking place twice per month. There were 273 site visits and pests were reported for the duration of the contract. **(Appendix B)** Both the Pest Control contractor and the School personnel reported communications breakdowns, the results of which are reflected in the service tickets. There were many times during the month of June '01 where the contractor either cancelled the service or only treated the exterior of the building due to accessibility issues (no one was there to let them in). There were many other times throughout the contract period where the service ticket reports "no one available to sign off". This caused some disagreement regarding what services had, or had not, been performed during the associated site visit.

East Orange – Sep '01 – Jun '02: IPM is implemented. There is a strong shift toward mechanical controls, inspection and maintenance and spot-application of baits and gels. Pest sightings are declining and complaints from school personnel have been virtually silenced (as reported by same to ERHC during site visits and conversations). 324 site visits, 288 pest sightings. The most significant numbers occur toward the end of the contract period where there is a sudden, dramatic drop in the pest sightings during the months of May '02 and June '02.

Conclusion

In the absence of parents, school administrators and/or laws requiring IPM in schools, children may be unnecessarily exposed to unnecessary pesticides. As we were able to observe, high levels of pest control were achieved and maintained within a properly executed IPM program which simultaneously eliminated unnecessary pesticides in the school environment (South Orange/Maplewood (SO/Mpd), Cedar Grove (CG)). The most important inputs for success were education, communication, cooperation and commitment on the part of the contractor and the school maintenance personnel (all). An IPM policy in place at the school board level was also an effective tool that motivated and supported the maintenance and contracted personnel in their pest control choices (CG). A long-standing IPM program appeared to have achieved a higher degree of pest control (SO/Mpd-6yrs) than the "newer" programs (CG – 3yrs, EO-1yr), suggesting that there may be a "start-up" period of a few months before the full benefits of IPM are realized. Finally, it must be noted that at the outset of the program, potential participants were somewhat hesitant, even reluctant, to get involved. As the program progressed and unknowns transposed into knowns and benefits began to manifest (less pests and less pesticides), the tensions eased and the entire program became routine (EO). This is yet another aspect of the project that underscores the need to present IPM as a process, not an "overnight" solution, so as to avoid building false expectations and running the risk of defeating a fledgling IPM effort before it has had the required time to establish itself.

Submitted by Jean Walker, Chief Enforcement Officer, Essex Regional Health Commission

Hudson County

PS#31-The first visit to the school in August 2001 and subsequent visits showed the building to lack window screens allowing pests to enter the building. Exterior doors required door sweeps and an overgrown area of vegetation existed adjacent to the school littered with debris providing an excellent source for pest infestation. Throughout the interior of the school, debris and clutter as well as food remains were noted in inspections. In the boiler room of the school, leaking pipes, and wall openings surrounding pipes were noted, in addition to a section of the floor, which was excavated and left open for a connection to the school's sewer system for the portable classrooms in the parking lot. This area provided a catch basin for the water that drained from the leaking pipes. Rodent bait boxes were noted on inspection visits, which were in areas easily accessed by students. In addition, some of the bait boxes, which were observed, were not secured as required by regulation. A subsequent violation was issued to the pest management company who serviced the school.

In January of 2002, training presentations were provided to faculty and staff to educate those in attendance on the principles of IPM. In addition, the results of the inspection visits, which were conducted by staff members from Hudson Regional Health Commission and the Pesticide Control Program, were also presented which identified target problem areas. These presentations proved to be very enlightening to all in attendance.

Robert Fulton School-North Bergen- Initial inspections identified sanitation and structural issues as the primary source of pest problems at the school. Common pests including ants, roaches and rodents were named by the school's administration as the primary targets of their pest management needs. This school has contracted with the same pest management company for the past three years. A review of the records of application indicated insecticide use as the major pesticide applied for ant and roach control. Other usage of pesticides was minimal.

Structural concerns identified on inspection were the need for screens in the basement cafeteria windows, as well as the modification of shelving in the school's library, which doubles as a cafeteria. Unable to clean beneath the shelving due to the decorative scallop edging, it was recommended to the staff to modify that edging so as to allow for cleaning beneath the bookcases which harbored litter from the usage of the library. The maintenance staff implemented the recommended changes during school vacation.

One of the major issues addressed at the school was sanitation, with clutter observed in numerous areas including classrooms, hallways and offices. Lack of storage facilities and scheduled deliveries of supplies regardless of need, proved to be major concerns of the staff. Subsequent inspections revealed measures implemented by maintenance staff to improve sanitation and reduce clutter through the organization of storage areas as well as the removal of unnecessary supplies. In addition, within the cafeteria, a new storage cabinet replaced a table under which supplies were stored in boxes. Other areas within the school exhibited improved sanitation to reduce pest problems.

Busy Place Day Care-Jersey City-One of the major issues in dealing with this day care was the structure in which it existed. This was a corner storefront within the city, the street level housing the daycare with four apartments above and an unfinished basement below ground. The owner of the daycare leased the street level storefront for use as a daycare, which provided services for twenty-one children. The primary pest problems were roaches and rodents. Sanitation concerns were addressed in the kitchen and janitorial closet to eliminate standing water as well as open food containers and garbage cans. The unfinished basement was identified as a primary source of the pest problems that existed within the daycare due to considerable debris, structural issues, as well as an open window well. The window well was found to provide direct access to the basement from the street for rodents as well as moisture, which leaked from an air conditioner

directly above the window well. Numerous dead roaches and rodents were found in the basement; an area which provided storage to many of the daycare's supplies. Routine pesticide applications were provided by a licensed pesticide applicator business for insect and rodent controls.

This daycare setting brought to the attention of the project participants the issue of an absentee landlord, who in many cases ignored the numerous concerns of those who occupied the building. Recommendations for structural and sanitation issues as well as utilizing IPM practices were also provided to the landlord by the pest control company who serviced the property. The pest control company also noted apathy on the part of the landlord to address necessary changes, which would improve the health and safety of his tenants.

Conclusion *(as submitted by Deborah Rucki Drake-HRHC Program Coordinator)*

School officials, especially those involved with the pesticide applicators, should be educated regarding Integrated Pest Management practices. School administrators and other persons having pest control decision-making responsibilities for school buildings and grounds should become aware of the pest control options available to them. Parents should be made aware of the current pest management practices in their children's schools. Contracts should be awarded only to those applicators utilizing IPM methods and this stipulation should be in the contract.

This report demonstrates the schools now have a new awareness regarding pesticide usage but the pesticide contracts were already awarded when we started the project.

A variety of pesticides are currently applied at the schools. **(Appendix C)** The pesticides should be reviewed to determine which seems to be the least toxic and most effective for the particular pests at each school. The schools are on a scheduled spraying program plus applications of pesticides are made when requested by the schools. Scheduled spraying may not be necessary.

Much of the pest infestation at the school sites can be prevented and or reduced by educating students and staff about the responsibility of sanitation. As noted during investigations at our designated schools, food leftovers, food in classroom closets, gum near water fountains, paper clutter, etc. were detected during many of our visits.

Structural changes and repairs can be incorporated to reduce the need for pesticide applications. The mice infestation at PS #31 was greatly reduced by changing the shelving in the kitchen. Food crumbs were prevented from gathering under the library shelving at Robert Fulton by enclosing the bottom of the shelving. Such examples demonstrate structural changes can reduce pests.

Project Summary

This project was created as a 'pilot project' for the purposes of educating the participants on implementing Integrated Pest Management (IPM) practices in a school environment. Anticipating legislation mandating IPM either on a National or State level, the Pesticide Control Program along with the members of the County Environmental Health Act (CEHA) program in Hudson and Essex counties, joined together in this effort. Education provided the foundation for a better understanding of the components of an IPM program as well as the necessity for IPM in schools.

Prior to the conclusion of this project, New Jersey signed into law the requirement for IPM to be implemented in all NJ schools by June of 2004. This project will serve as the basis for

many of the issues of pest management in school environments to be addressed in training sessions for all school personnel. New Jersey's school IPM bill requires the development of a model policy for use by all schools in the development of their individual policies. As a result of many of the observations which were noted during this project, the model policy which was developed and the future model IPM plan, are reflections of some of the critical needs which must be met in implementing an IPM program in a school.

Successes and failures can be noted in any undertaking and this project exhibited both. The cooperation on the part of some personnel resulted in many of the successes, which were observed. More importantly, members of these school communities were provided with an educational experience, which they can utilize in both their school and home environments. Changes in attitudes towards pesticide usage, employing other methods of pest management, especially improved sanitation, were some of the measures of success this project provided. The results of this project have been used in the education of many other groups on what goes into an IPM program, as well as why such a program should be in all schools regardless of whether or not the law requires it.

Appendix A:

Essex/Hudson Counties
Integrated Pest Management (IPM) Project in Schools

CRITERIA FOR SCHOOL SELECTION:

1. Indicate school level:
   - ___Elementary school
   - ___Middle or junior high school
   - ___High school
   - ___Other (please specify)

   Student enrollment_____ Staff_____

2. School located in a (n):
   - ___Urban (inner city) area
   - ___Residential
   - ___Suburban area

3. Approximate age of structure_____

4. Exterior observations:
   - ___Structural cracks and crevices
   - ___Broken windows
   - ___Lack of window screens
   - ___Exterior doors propped open
   - ___Open dumpsters
   - ___Debris littered areas
   - ___Overgrowth of vegetation

5. Are pesticides of any kind used in the school or on any school property? (Pesticides are defined as any substance used to kill, repel or control pests. They include herbicides, insecticides and rodenticides.)
   - ___ yes
   - ___no

6. Who applies the pesticides? (Check all that apply)

___teachers	___indoor	___outdoor	___both
___custodial staff	___indoor	___outdoor	___both
___private contractors	___indoor	___outdoor	___both
___other (please specify):	___indoor	___outdoor	___both

7. If a private contractor applies the pesticides, please identify (name and address): _____

8. How long has the school employed this contractor? _____

If less than one year, reason for change in contractors_____
_____

9. How much do you budget for pest control per year? $_____
   Past 3 years $_____

10. Who makes the decisions regarding pest control practices in the school?
    Name_____ Title_____

11. Does the school have a written policy regarding pest control? YES____ NO____

12. Does the school maintain records of pesticide applications? YES____ NO_____

13. Is notification given prior to application of pesticides? YES____ NO_____ If notice is given, form of notification is: ____written ____verbal ___posted at a central location in the school

14. Notification is given to: (check all that apply) ____administration ___staff ___custodians ____teachers ___students ___parents ____other (specify)_____

15. Are pesticides applied on a routine basis or in response to a pest problem? ____routine ___response ___both

16. Are non-chemical methods used to control pests? _____sanitation and housekeeping ____vacuuming ___structural (exclusion barriers e.g. screens, air doors, caulking) ____biological controls ____other (please specify)_____

17. Are disinfectants routinely used in the school? (specify location)_____ Applied by whom? (teachers, custodian, kitchen staff, etc.)_____

18. What is the percentage of individuals (students and staff) within the school with asthma or other chronic upper respiratory conditions?_____%

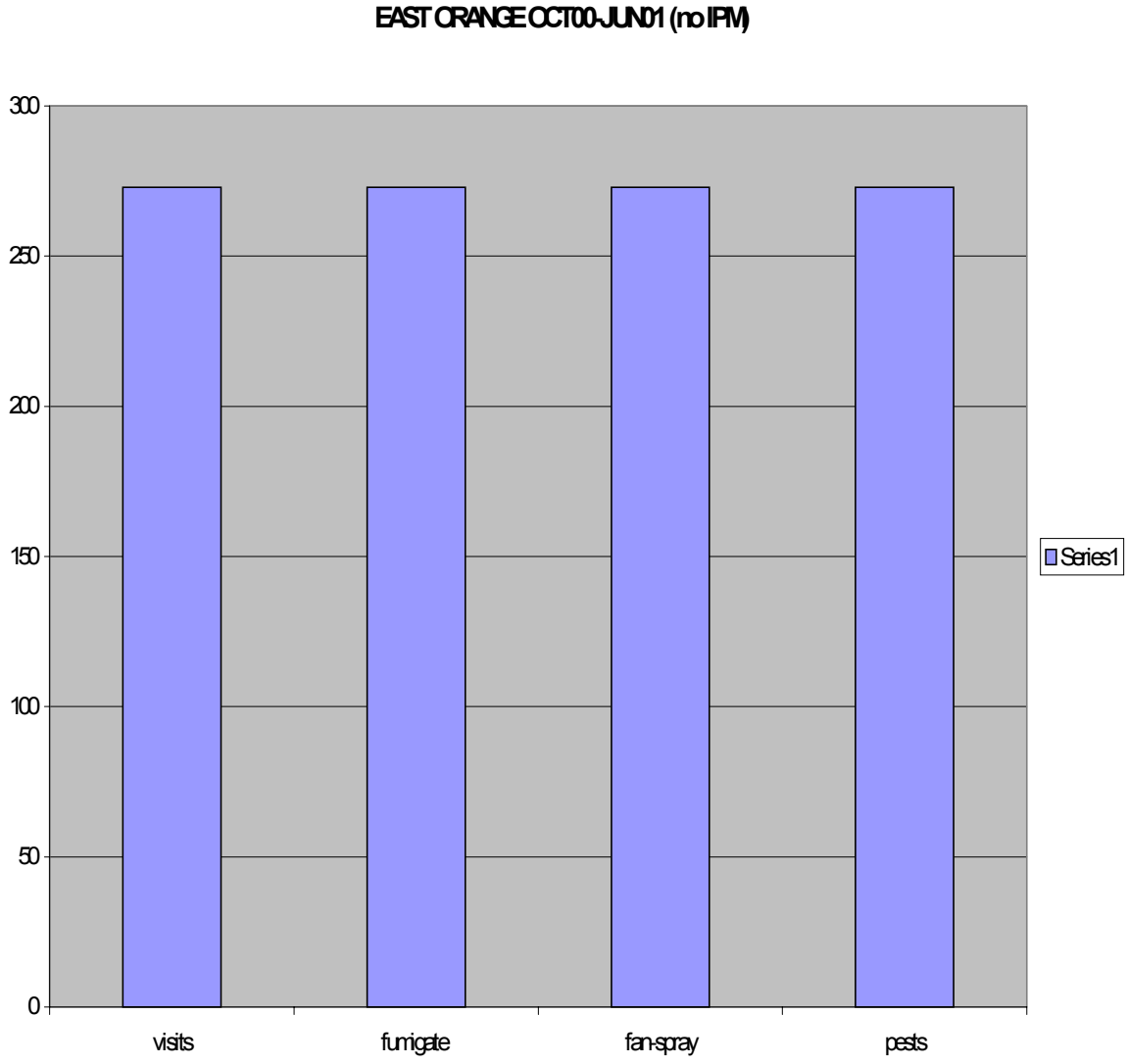
19. Other health related incidences following pesticide applications? (nurse records)_____

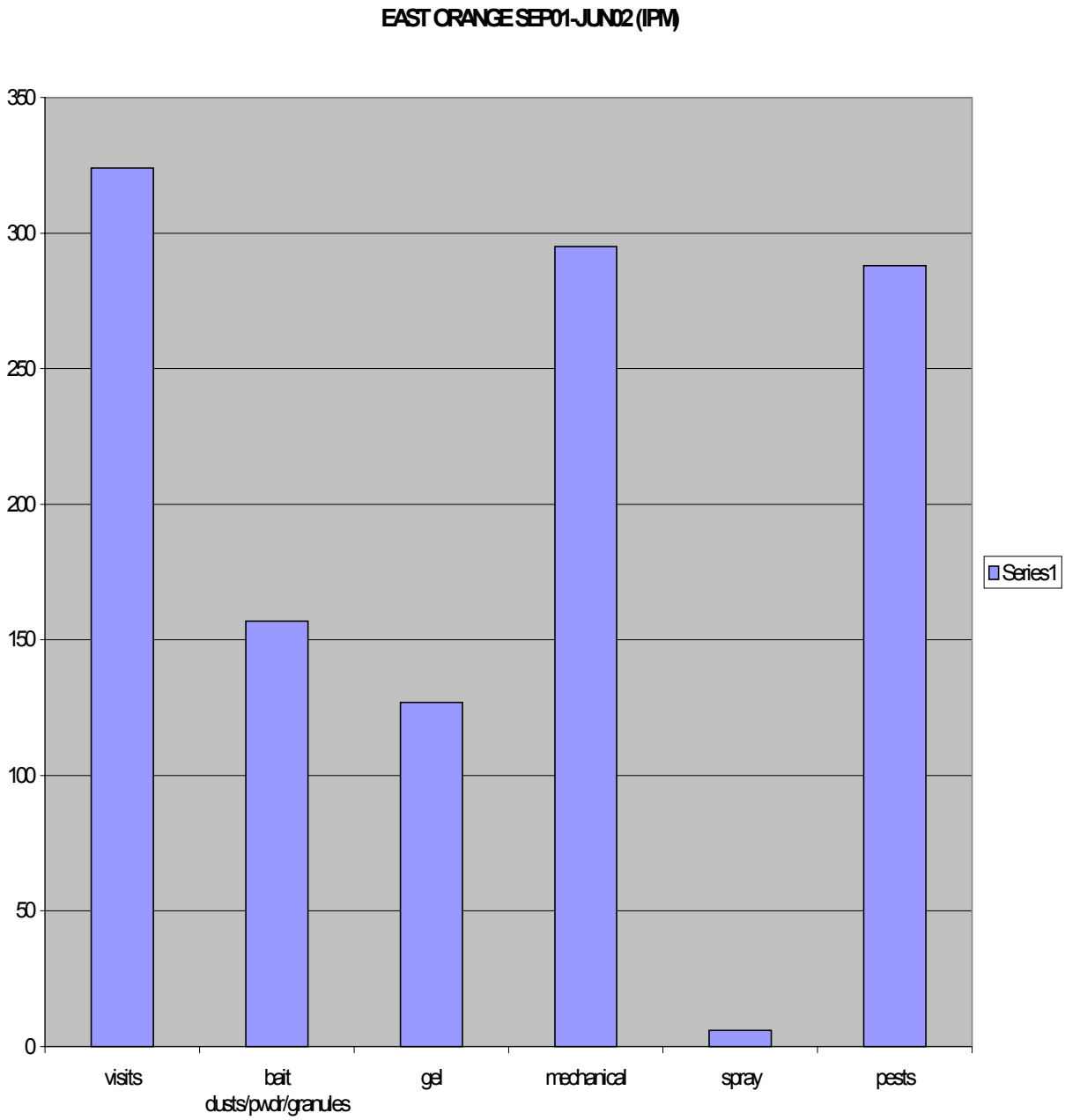
20. What are the primary sources of pesticide products?_____

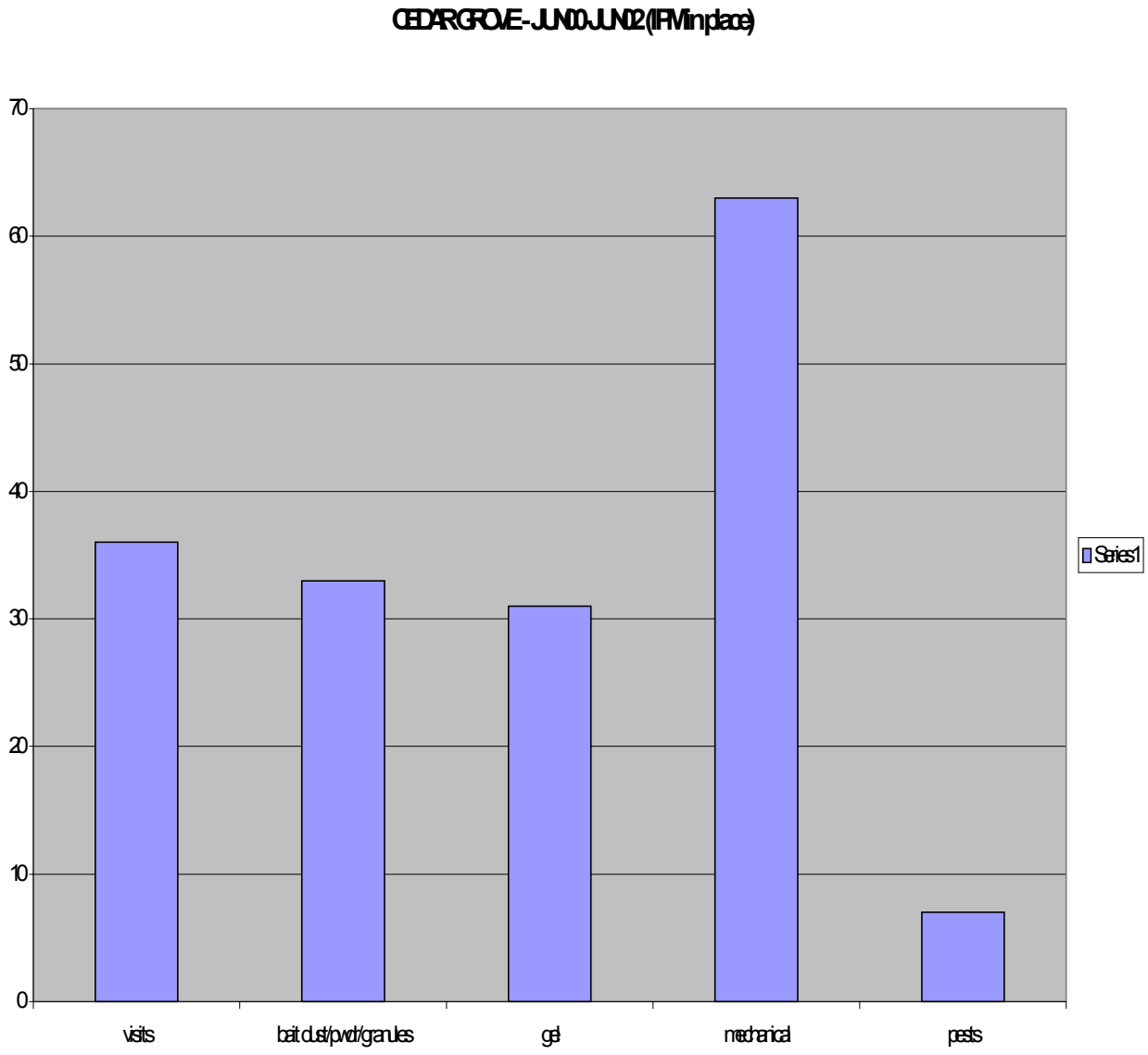
21. Where are pesticides stored?_____

Appendix B:

Essex Regional Health Commission
East Orange and Cedar Grove School Districts


EAST ORANGE OCT00-JUN01 (no IPM)
300
250
200
150
100
50
0
visits
fumigate
fan-spray
pests
Series1

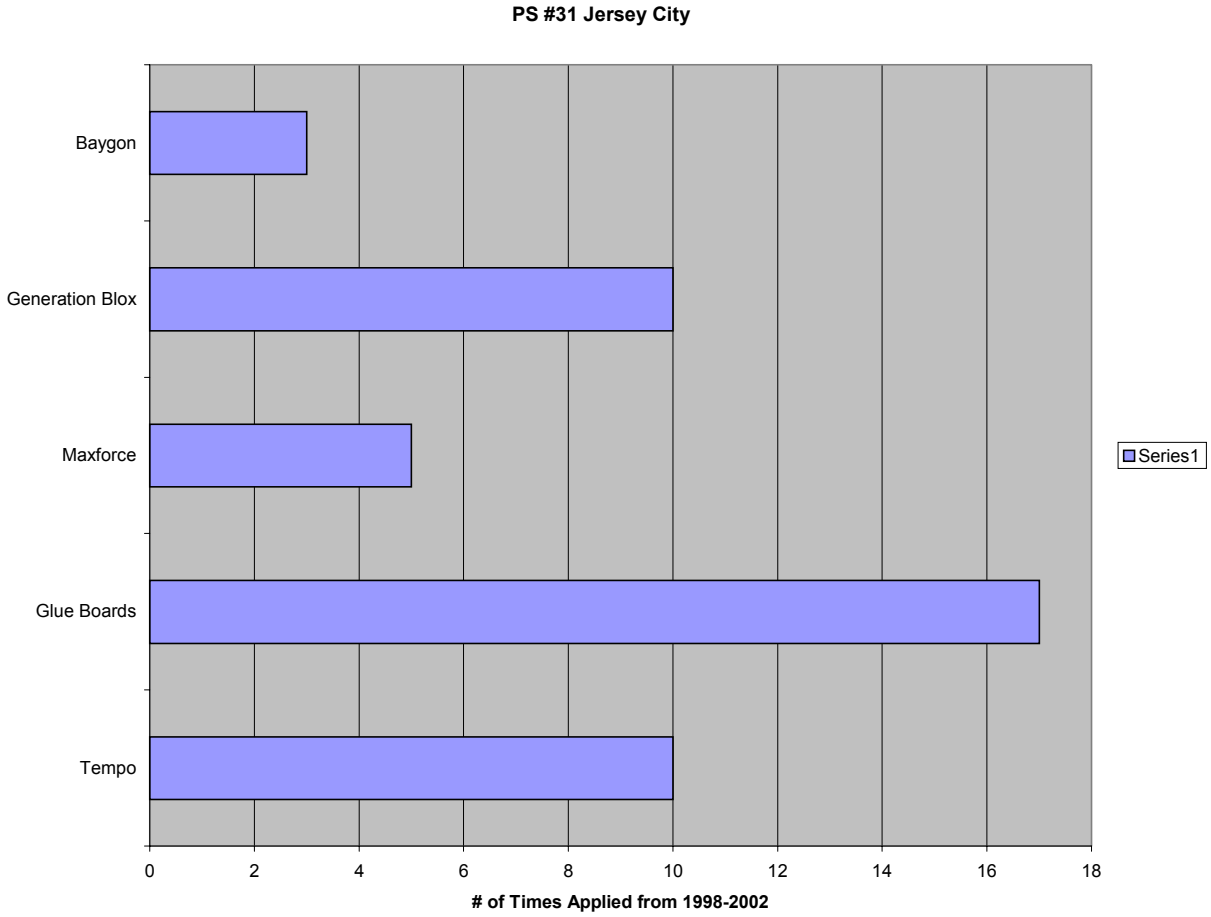

EAST ORANGE SEP01-JUN02 (IPM)
350
300
250
200
150
100
50
0
visits
bait dusts/pwdr/granules
gel
mechanical
spray
pests
Series1

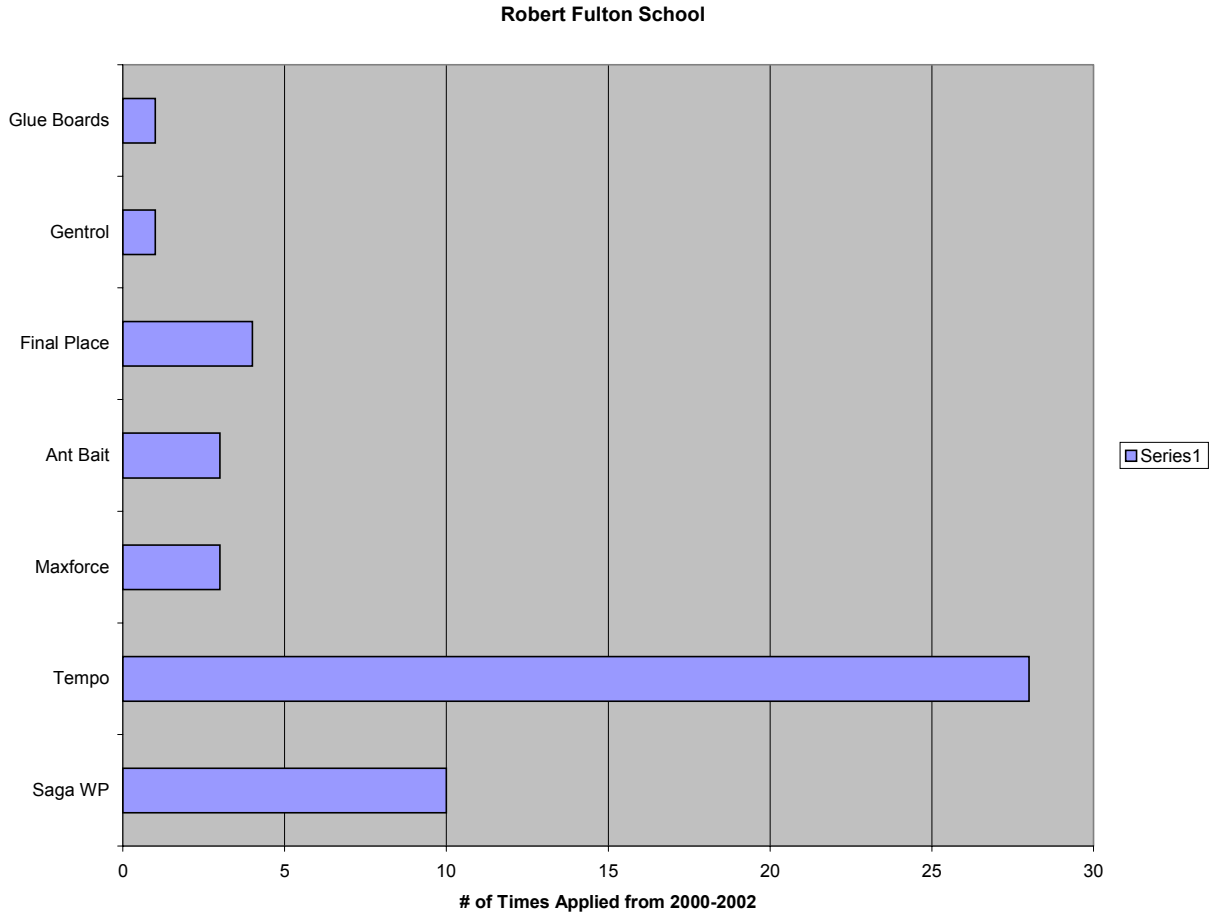


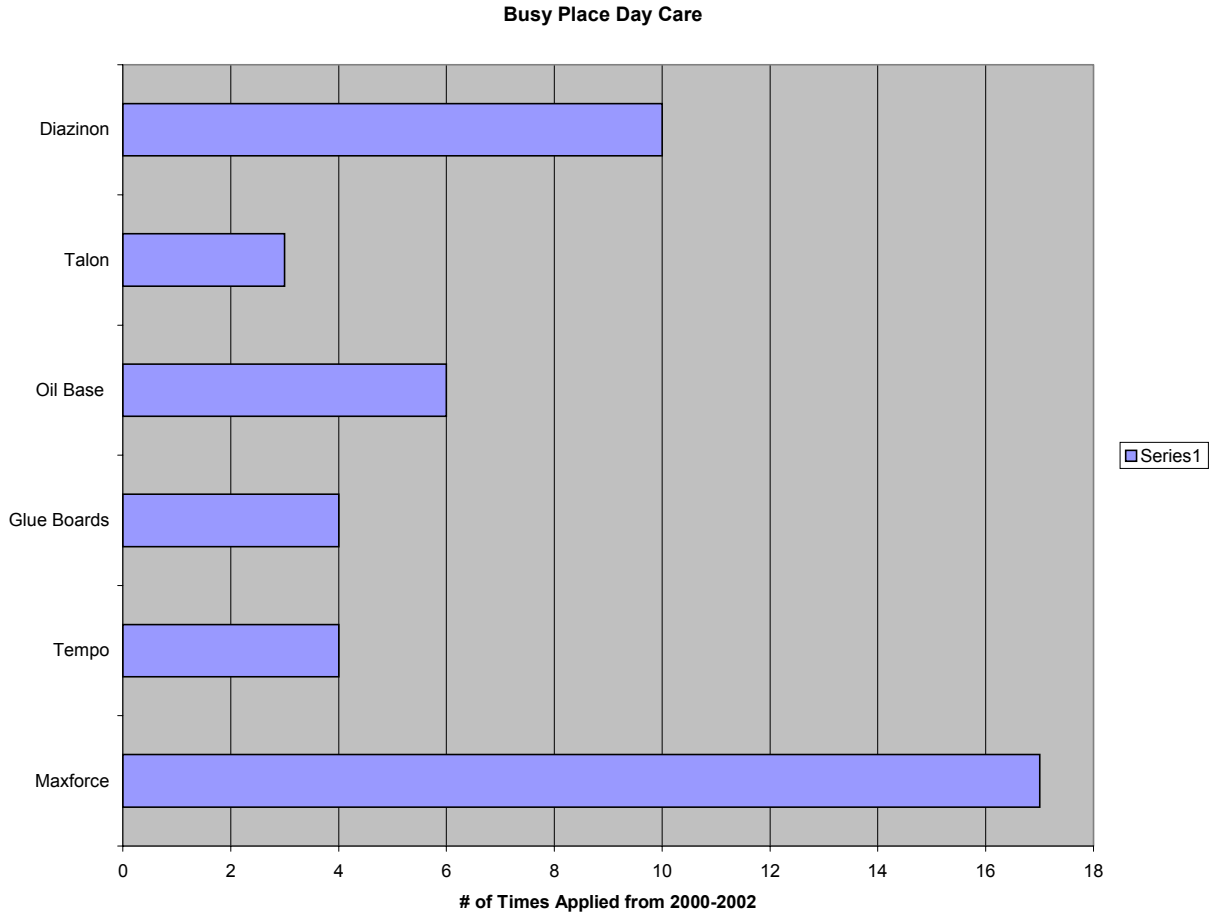
Data obtained by ERHC review of Pesticide Applicator Business records

Appendix C:

Hudson Regional Health Commission
PS#31-Jersey City, Robert Fulton-North Bergen
Busy Place Day Care-Jersey City


PS #31 Jersey City
Baygon
Generation Blox
Maxforce
Glue Boards
Tempo
0
2
4
6
8
10
12
14
16
18
# of Times Applied from 1998-2002
Series1


Robert Fulton School
Glue Boards
Gentrol
Final Place
Ant Bait
Maxforce
Tempo
Saga WP
0
5
10
15
20
25
30
# of Times Applied from 2000-2002
Series1



Data obtained by HRHC review of Pesticide Applicator Business records