

## Environmental Health Watch's Collaboration with Cuyahoga Housing Authority Demonstrates the

**T**raditional methods of household pest management not only have limited success in actually eliminating pests, but in many cases, efforts at control can cause additional harm to residents, especially children. A new program to control household pests—adapted from agriculture—attempts to control pests more effectively while using less pesticides. A collaborative interagency effort is helping to make Integrated Pest Management (IPM) a viable option for the affordable housing community.

IPM is a new approach to pest control that offers a means to reduce the risk from—and in some cases, the amount of—chemical pesticides needed. IPM reduces risk by monitoring pest populations, conducting environmental controls, and placing small amounts of low-toxicity, low-volatility pesticides on surfaces inaccessible to children. By encouraging tenants, building management and staff, and even pest control contractors to work together and proactively eliminate conditions that allow infestations to thrive, dramatic pest reduction can be achieved without using large amounts of pesticides.

Cockroach infestation poses an especially compelling challenge. Evidence demonstrates that cockroach allergen is a potent, pervasive and persistent asthma trigger for low-income, inner-city populations. The common response to cockroach infestation is monthly pesticide spraying. But this method compounds the risk children face from cockroaches with a new risk: children are particularly vulnerable to the toxic effects of exposure to household pesticides.

### **IPM in Action in Cleveland's Affordable Housing Units**

With this in mind, Environmental Health Watch (EHW) teamed with the Department of Housing and Urban Development Office of Healthy House and Lead Hazard Control to conduct a study of the efficacy of IPM in an affordable housing development in Cleveland, Ohio. Asthma rates have increased dramatically over the past 20 years and asthma is now a major public health concern, especially for children. Removing the threat of roaches, and their debris (which contains the allergens) can benefit young people with asthma. EHW's study tested new methods for assessment of cockroach allergen contamination, the safer elimination of cockroach infestation, and finally, effective cleanup of roach allergens.



### **Why Cockroaches?**

Live cockroaches, as well as their remains and feces, cause asthma attacks in people sensitive to cockroach allergens according to a 2000 Institute of Medicine Report. The Inner City Asthma Study found that more than 60% of inner city children were sensitive to cockroach allergens. Asthma is a costly disease that disrupts a family and undermines a child's ability to learn. There is growing evidence that mice may have a similar effect.

This case study is part of a series addressing integrated pest management in low income housing. To access additional fact sheets in the series, please visit: [www.healthyhomestraining.org/ipm/studies.htm](http://www.healthyhomestraining.org/ipm/studies.htm).

EHW worked with Cuyahoga Metropolitan Housing Authority, Greater Cleveland Asthma Coalition, the United States Department of Agriculture (USDA) Research Station in Gainesville, Florida, and the Johns Hopkins Allergy and Asthma Center to run the project.

Three multi-family complexes operated by Metropolitan Housing Authority in Cleveland, Ohio were the candidates for the project. The stated goal of the project was to explore methods to reduce cockroach allergen contamination in low-income public housing. The cockroach control intervention was “precision-targeted IPM,” a modification of the standard cockroach IPM strategy, designed by the USDA Imported Fire Ants and Household Insects Research Unit, a partner in this project. Their approach increases the usual level of cockroach monitoring so that a detailed spatial analysis of harborages and feeding points can be used for more precise placement of pesticides.

### **Outreach Efforts**

Outreach to participants began with a letter from the housing authority introducing the project, which was followed by a phone call to the residence. If the phone call was not successful, housing authority staff went door-to-door in the buildings to engage tenants. The housing authority staff visited participants’ homes to provide them with a detailed description of the activities that would take place during the project and the incentives that would be provided to them for their participation.



Incentives given to engage participants included a \$15 food certificate from a local supermarket for each visit to the unit and a new vacuum cleaner to encourage them to minimize food debris in their units. Furthermore, during the course of the intervention as resident health educators and the tenants identified specific needs unique to each unit, additional incentives were given, including new garbage bags, smaller garbage cans, or new food storage containers, which would help reduce the likelihood of renewed pest infestation.

### **Identifying the Level of Infestation**

Initial roach infestation was measured in four ways: 1) roaches captured on sticky traps; 2) roaches flushed from harborages; 3) occupant reports of roaches; and 4) staff observations. However, due to the incidence of large food harborages that might have kept roaches from being lured by sticky traps, it was found that flushing was the most effective means of measuring the true level of infestation.

Stu Greenberg of Environmental Health Watch described the flushing approach as “reconnaissance by fire.” Using a heat gun with a PVC collar to prevent burns (recommended by USDA staff), EHW conducted an “active inspection” of the units by passing the gun along baseboards, electrical outlets, light fixtures, tables, door frames and anywhere else roaches might be hiding. Aware of the risk that the heat might simply push the roaches in deeper, the results were nonetheless very good. A large number of roaches came out, and harborages not traditionally targeted by the pest control contractor were identified.

Aside from the efficacy of the heat gun in simply drawing out roaches, it also proved a most effective recruiting tool. Skeptical tenants, convinced that roach infestation was an intractable problem, became much more enthusiastic about the IPM strategy after they saw that it was radically different from other methods. As Mr. Greenberg explained, once tenants realized that heat gunning and vacuuming of roaches had a real effect, they “saw hope” that the problem could really be managed, if not solved all together. This encouraged tenants to actively participate in meeting their responsibilities under the program.

### **Working Together to Implement the Program**

Effective implementation of the IPM strategy was a team effort that required the housing authority, the tenants, and pest control contractors to each play an active role in combating the infestation. As is implied, an integrated strategy could not be effective without all participants doing their part. Tenants, of course, became much more enthusiastic when they saw progress being made. It encouraged them to cooperate with pest control contractors, enable the housing authority to make necessary repairs to their units, and most importantly, to create an unwelcoming environment for roaches. The housing authority, as noted, was responsible for repairs to the units, including caulking holes in walls and floors to prevent harborages—especially in areas where food debris could collect. In addition, they conducted basic unit repairs, such as the plumbing and other systems that provided a safe harbor for roaches.

The work required the participation of all of the housing authority staff, from the building’s environmental supervisor, who served as entrée to tenants and liaison with operations and management staff, to those staff and contractors responsible for building maintenance and repair. Of course, these contractors, who often interacted with the pests in the course of their repair work, were enthusiastic about participating in a project that could reduce their exposure to roaches. Furthermore, the pest control contractors worked with EHW to better understand where to place roach traps and identify harborages (the old strategy of simply placing a couple of traps in kitchen cupboards obviously was not doing the trick).

In fact, the one unit that did not produce the desired results was the rare instance where the tenants refused to be cooperative. While for most residents, the real successes of the heat gunning method was enough for them to enlist in the rest of the IPM strategy, this one unit with a long-term history of heavy infestation, refused to change its behavior in order to stop roach infestations. The unit had serious repair problems, but the tenants were not cooperative with the Housing Authority. In spite of 12 site visits by EHW, the tenants did not remove food debris nor work with the other participants. The roach infestation was not mitigated.



No pesticides were sprayed during the IPM process, nor were foggers or bombs used. No chemical flushing was done either. To counter infestations, low-toxicity and low-volatility gel baits and bait stations, as well as boric acid, were used. But because the heat gunning had identified specific harborages, these traps could be targeted, as opposed to haphazardly distributing the traps throughout the units. This meant that there was no broadcast application of pesticides—a huge benefit for the health of tenants and others in the buildings.

### **Objectives and Outcomes**

The cockroach control objective was to achieve a 95% reduction in the roach population, as measured by the number of roaches trapped and flushed. That level of reduction was achieved in all but one case (the uncooperative tenants) and required one to four flush/vacuum/bait visits.

Of the 18 housing units that were part of the program, live roaches were seen in 11 of them (generally an indication of heavy infestation) and dead roaches were seen in 16 units. Building defects (holes in walls,

plumbing leaks, etc.) were identified in 13 of the 18 units and food debris and excess clutter in 10 of the 12 occupied units. This speaks to the value of the IPM approach to involve the housing authority and the tenants—without them fulfilling their roles, a true reduction in roach infestation would not be feasible.

The initial roach counts in the units varied widely. Six units had counts of 243 or greater, and two had counts of more than 1,000! In most cases, two or three visits were enough to achieve the 95% reduction. Three units achieved a 100% reduction; of the two units with major infestations, the unit where the IPM was unsuccessful (due to the tenant behavior) had a roughly 80% reduction, while the other a 97% reduction in four visits.

Overall, the combination of cockroach infestation reduction through precision-targeted IPM (including hot air flushing and HEPA vacuuming), a one-time professional cleaning based on the HUD lead dust cleaning protocol, occupant education, and occupant on-going cleaning effort, the project succeeded in substantially reducing cockroach allergen levels.

### **Lessons for Future Interventions**

This small exploratory project demonstrated that previously intractable roach infestations could be virtually eliminated through a labor-intensive, aggressive and precision-targeted IPM strategy sustained over several months. It required cooperation from the public housing management, maintenance and environmental staff, and from the tenants.

Of course, this labor-intensive experiment, combined with the high degree of cooperation involved, cannot be achieved nor replicated overnight. What it shows, however, is that there is a viable alternative to traditional pest control methods. What is more, by incorporating already established techniques for responding to lead dust hazards, there is certainly a precedent for the type of intervention warranted here.

The Environmental Health Watch project demonstrated that effective roach control requires a division of responsibility among the housing authority, the pest control contractor, and the tenant. The housing authority has to provide and maintain the dwelling unit free from defects that support roach infestation. The pest control contractor has to thoroughly inspect the entire unit to determine roach harborages, reservoirs, entry points, food and water resources, use safe and effective treatments to get rid of the roaches, and provide ongoing monitoring. Finally, the tenants must maintain housekeeping practices that do not support roach infestation and they must cooperate with pest control efforts by the contractor.

EHW developed a guide to reducing infestation with IPM that is now available on their Web site ([www.ehw.org](http://www.ehw.org)). In addition, two slide shows on the organization's Web site summarize the pilot IPM project, and a valuable guide for contractors —A Model Contractor Program for IPM Management—was also created.

The new challenge is to find ways for this approach to be feasible and cost-effective to encourage more public housing authorities and their pest control contractors to adopt it. To achieve a large scale implementation of this type of pest control strategy would require reevaluating the pest control contracting process (e.g., fee structure, specifications, monitoring), training and supervision of contractor personnel, maintenance and repair practices; and tenant education and enforcement of responsibilities.

Given the risks to children inherent in traditional pest control methods, and the real benefits that can be realized from IPM, the EHW model just might be a valuable contribution to the quest for safer and cleaner affordable housing.

## For More Information

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