

## In Cleveland, Collaboration Makes a Difference

*Through integrated pest management (IPM) conducted in a collaborative approach that includes residents, property management, and the pest control operator, previously intractable roach infestations may be virtually eliminated. The success of a Cleveland, Ohio IPM pilot described in this case study was the result of an ongoing, labor-intensive, aggressive, and precision-targeted IPM strategy sustained over several months. The heat-gun approach to flushing cockroaches was effective and avoided exposure to chemical flushing agents. A person did not need a pest control license to use it. (Baiting was done by a licensed pest control contractor.) The labor-intensive approach, combined with the high degree of cooperation from the team and the residents, cannot be achieved or replicated overnight. However, it demonstrates that there is a viable alternative to traditional pest control methods that may reduce resident exposure to pesticides. Property managers and public housing authorities need to consider IPM to more effectively control cockroaches.*

**E**nvironmental Health Watch (EHW) conducted a study of the efficacy of IPM in an affordable housing development in Cleveland, Ohio to address pest infestations that may have contributed to asthma in residents of this housing development. Asthma rates have increased dramatically during the last 20 years of the 20<sup>th</sup> Century. Asthma is a major public health concern, especially for children. Removing the threat of roaches and their debris (which contains the allergens) can benefit children with asthma. 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.

EHW's goal was to explore methods to reduce cockroach allergen contamination in low-income public housing. The study focused on three multi-family complexes operated by Cuyahoga Metropolitan Housing Authority (CMHA) in Cleveland, Ohio. The cockroach control intervention was "precision-targeted integrated pest management (IPM)" – a modification of the standard cockroach IPM strategy – designed by the USDA Imported Fire Ants and Household Insects Research Unit. USDA's 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.



### 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 might have a similar effect.

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

IPM is a commonsense approach to pest management to keep pests out, reduce their harborage, food and water, and, where necessary, use low risk pesticides.

## Outreach Efforts

CMHA sent a letter to participants introducing the program. It followed with a phone call to the residence. If the phone call was not successful, CMHA went door-to-door in the buildings to engage tenants. Staff visited participants' homes to provide them with a detailed description of the activities that would take place during the project and the incentives residents would receive for their participation.

Participants were given incentives that included:

- A \$15 food certificate from a local supermarket for each visit to the unit
- A new vacuum cleaner to encourage them to minimize food debris in their units.

During the course of the intervention, as EHW health educators and the tenants identified specific needs unique to each unit, EHW gave additional incentives, including garbage bags, smaller garbage cans, or food storage containers, to help reduce the likelihood of renewed pest infestation.

## Identifying the Level of Infestation

EHW and CMHA measured initial roach infestation in four ways:

1. Roaches captured on sticky traps;
2. Roaches flushed from harborages;
3. Occupant reports of roaches; and
4. Staff observations.

Due to the large amounts of food debris available in some units that might have kept roaches from being lured by sticky traps, EHW 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, 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 were vacuumed up along with a great amount of allergenic debris, helping to identify harborages not traditionally targeted by the pest control contractor.



The heat gun was not only effective in simply drawing out roaches, it also proved an 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. The tangible results 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 play an active role in combating the infestation. An integrated strategy could not be effective without all participants doing their part.

Tenants became much more enthusiastic when they saw progress being made. Progress encouraged them to cooperate with the pest control contractor, enable the housing authority to make necessary repairs to their units, and most importantly, to create an unwelcoming environment for roaches.

CMHA repairs to the units, including caulking holes in walls and floors to prevent harborages where food debris could collect, and fixing plumbing and other systems that provided a safe harbor for roaches. CMHA's 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.

The maintenance workers who interacted with the residents in the course of their repair work, were enthusiastic about participating in a project that could reduce their exposure to roaches. Furthermore, they helped the team better understand where to place roach bait and how to identify harborages. The old strategy of simply placing a couple of traps in kitchen cupboards and baiting the hinges was not doing the trick.

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 success of the heat gunning method was enough for them to enlist in the rest of the IPM strategy, residents of this one unit with a long-term history of heavy infestation, refused to change their behavior to stop roach infestations. The unit had serious repair problems, but the tenants did not cooperate with CMHA. In spite of 12 site visits by the team, the tenants did not remove food debris or work with the other participants. The roach infestation continued.



The team sprayed no pesticides the process. It did not use foggers, "roach bombs," or chemical flushing. To counter infestations, EHW used low-toxicity and low-volatility gel baits and bait stations supplemented with boric acid. Because the heat gunning identified specific harborages, bait placement could be more precise.

### **Objectives and Outcomes**

The objective was a 95% reduction in the roach population, as measured by the number of roaches trapped and flushed. The team achieved that objective 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, the team initially saw live roaches in eleven of them (generally an indication of heavy infestation) and saw dead roaches in 16 units. The team identified building defects (holes in walls, plumbing leaks, etc.) in 13 of the 18 units and food debris and excess clutter in 10 of the 12 units.

The initial roach counts in the units varied widely. Six units had counts of 243 cockroaches or greater. Two had more than 1,000! In one of these, due to failure of tenant cooperation, the intervention reduced trapped cockroaches by 80%. In the other unit, good tenant cooperation resulted in a 97% reduction. The substantial reduction was due to multiple flush/vacuum/bait visits. In most cases, two or three visits were enough to achieve the 95% reduction. Three units achieved a 100% reduction.

Overall, the combination of cockroach infestation reduction through precision-targeted IPM (including hot air flushing, HEPA vacuuming and baiting), a one-time professional cleaning based on the HUD lead dust cleaning protocol, resident education, and continuing cleaning effort by residents, resulted in substantially reduced cockroach allergens to levels below those associated with asthma attacks. Go to [www.ehw.org/Asthma/ASTH\\_home1.htm#Pests](http://www.ehw.org/Asthma/ASTH_home1.htm#Pests) for a copy of the report.

## 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.

This labor-intensive experiment, combined with the high degree of cooperation from the team and the residents, cannot be achieved nor replicated overnight. However it demonstrates that there is a viable alternative to traditional pest control methods. What is more, lead dust cleaning techniques were found effective in reducing cockroach allergen levels.

The 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.

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