

## Integrated Pest Management: A Cost-Benefit Study for Hotels

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Integrated Pest Management, or IPM, is used by hotels all over the country to keep pests at bay and their reputations intact. But why? Is IPM more effective than traditional pest control methods? Is it more cost-effective? These are valid questions, but until last year, no “official” answers were given. The pest management industry was convinced from experience that IPM was more effective, but the cost benefit for commercial IPM users had not been directly addressed.

Recently, Orkin, Inc. and Virginia Polytechnic Institute and State University teamed up to study and evaluate, once and for all, the differences in efficacy – and cost – of IPM and conventional pest control programs.

### IPM: Where Did It Come From?

Before studying IPM, it is critical to agree on a definition. You will hear various definitions in the marketplace, but simply put, IPM is the use of all appropriate technology and management practices to bring about pest prevention and suppression in an environmentally sound manner. Notice that there is no mention of not using pesticides. Pesticides still have a place in an IPM program, but they should be considered the last option for controlling pests.

How did IPM come into being? Here’s a quick look at the pest-management milestones that led to the development of IPM:

1900-1960s – During this period, chemical-based pest control was king. The ability of pests and crops to develop resistances to pesticides and disease was largely ignored. The introduction of DDT in mid-1940s, seen by the agricultural industry as a “one-size-fits-all” solution to pest problems, sealed the industry’s total dependence on chemical pesticides.

In the late 1960s, following heated debate on the environmental impact of pesticides – DDT in particular – sparked by Rachel Carson’s “Silent Spring,” the agricultural community began to search for alternative methods of pest management. The EPA’s instituted a ban on DDT in the late 1960s further solidified the need for alternative solutions.

IPM was first introduced in the late 1960s, but its application was confined mostly to agricultural environments until the 1980s and 1990s, when it started becoming more common in schools, hospitals and other environments that are highly sensitive to pesticides.

In the early days of IPM, some considered it nothing more than a sales or marketing ploy. A way for companies to differentiate themselves from competitors. But today, IPM is the method of choice for many highly sensitive environments, such as food processors, restaurants, hospitals, hotels and schools.

### A “Monster” of a Testing Site

The first step of our study was identifying a suitable location to conduct it. We settled on a government-subsidized, low-income housing development in Eastern Virginia. As any pest management professional knows, this type of facility has traditionally been a difficult monster to control. We knew that any differences in the two methods’ efficacy would be readily apparent in such a setting.

Once the location and facility was selected, we then had to pick the units in the complex to include in the study. We selected the 100 units with the highest pest populations, based on the results of glue-trap placements throughout the facility. Half of these units (50 units) were treated with conventional pest control methods. The other half were treated with IPM-based procedures.

## Treatment Procedures

The conventional units received a liquid pesticide treatment applied as a general surface application in the primary rooms of concern – the kitchen and bathroom. Two common pesticides, boric acid aerosol dust and liquid cyfluthrin, were placed under the kitchen cabinets around the sink area. The liquid application was repeated every treatment and the dust replaced as needed. All applications were made per the label directions.

In the IPM units, areas that obviously harbored cockroaches were first vacuumed out with backpack-style, HEPA-filtered devices. In addition to physically removing the roaches, we also removed a great deal of organic debris that the roach population was using as a food source. After vacuuming, the units were treated with cockroach baits and an insect growth regulator (IGR). These non-volatile, non-residual methods are common components of IPM programs. The bait material was placed in the areas where the roaches were harboring in the kitchens and bathrooms, including under the sinks and countertops. The IGR used was applied as a station under the kitchen cabinets and replaced every three months. The bait material was replaced as the material was consumed.

After each treatment, glue boards with attractants were left in all of the units overnight. These monitors were placed in the same spots after every treatment. By recording the number of roaches on each board, we were able to monitor the changes in pest populations.

The IPM and conventional treatments continued for one year, with every service provided by the same technicians. The technicians working on the IPM-treated units never worked on the conventionally treated units and vice versa.

### Results: IPM More Effective, But At What Cost?

The first thing we noticed after the second month in the study was that the cockroach populations in the IPM units crashed significantly. The number of insects being caught on the monitor boards was decreasing steadily after every treatment. Based on the drop in trap captures, we were able to make some alterations to the service frequency in some IPM units. By the end of the study, we had almost completely eradicated the roach population in some of the IPM units. As a matter of fact, by the end of the sixth month, forty of the fifty units had trap counts so low that they were placed on an every-other-month service frequency.

As for the conventionally treated units, the number of cockroaches caught in the traps never dropped significantly. Service had to be repeated monthly just to keep the original infestation from growing. At the end of the twelve months in the study, we were never able to completely eliminate the population of roaches in the conventional units.

Our efficacy results were not entirely surprising. Years of anecdotal industry experience had shown IPM to be far more effective than conventional methods in reducing pest populations. But we still had to analyze how the cost factors added up.

To figure the total cost of the services, a couple of cost factors were considered: material and supply cost, and the cost of technician time. For the cost of materials and supplies, we used the average market prices for all. To determine the exact amount of material used in each unit, all applicators were weighed on an electronic scale before and after each treatment. The base cost of the product per gram or ounce, depending on how the original package was weighed, was determined.

Over the course of the yearlong study, the total amount of pesticide material used in the IPM-treated units versus the conventional units was vastly different. In the IPM apartments, an average of only 5.7 grams of bait and IGR was applied in each unit. Conversely, in the conventional units, an average of 138.1 grams of combined liquid and dust material was used in each unit. However, the lower amount of material did not result in a lower cost. The reason for this is that the materials used in the IPM units cost more per gram than conventional pesticide products. So, even though the conventional treatments required an average of 24 times the amount of material than the IPM treatments, the total cost of materials and supplies was about 19 times less.

The greatest variance in the cost difference, however, was found to be in the labor and time costs. To analyze this, we broke the times up into two factors. Time for the initial treatments and time for the average maintenance service. Labor costs were computed at a rate of \$60 per hour. In the IPM units, the time spent on the initial service was considerably higher, at about 12 minutes, versus an average of less than 3 minutes on the conventional units. As the study progressed, however, the initial time spent on the IPM treatments was more than offset by the maintenance time saved. The time savings were compounded by the fact that the IPM treatments could be reduced to every other month while the conventional treatments had to continue on a monthly basis. At the end of the year, the IPM units were serviced in an average of about one minute per treatment, while the conventional units required closer to two minutes per treatment.

## **Conclusion: IPM More Expensive, but Far More Effective**

After reviewing the data, we concluded that while IPM-based service is significantly more expensive over the course of a year than conventional service – a cost that is often reflected in higher prices for IPM customers – it is able to control cockroaches in a way that conventional techniques cannot.

For hoteliers, the lesson is simple. Because IPM and traditional pest control differ so widely in efficacy, cost should never be the sole deciding factor. When choosing a pest management service provider, ask for a detailed description of the proposed service procedures so you can be sure you are comparing “apples to apples.” Finally, you should consider which costs more: the marginal expense of an IPM program, or the lost revenue and damaged reputation that comes with pest sightings in your hotel.

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