

OFFICES, SCHOOLS & COMPUTER ROOMS

Introduction

Offices and schools, though outwardly different, share many features which make it appropriate to consider them together from a pest management viewpoint. In general! they are both non-residential, daytime workplaces where the occupants are engaged in sedentary, non-manufacturing activities.

These buildings are subject to infestation by a wide variety of pests. Some of these pests, such as ants, are mostly just a nuisance. But others, such as cockroaches, may contaminate food in cafeterias and cause a health hazard. In other cases, pests may cause damage to electronic equipment found in offices and schools. Such equipment includes typewriters, word processors and photocopying machines, but perhaps the most vulnerable items are computers.

Computers are an increasingly common feature in offices and classrooms and insects can cause damage or destruction to them. For instance, cases are known of cockroaches entering computers and causing short circuits and fires which destroyed the computer. Sometimes body fluids from insect secretions or from a decomposing insect's body will cause corrosion of circuit boards. What's more, a moving insect or a

fragment of an insect body part can scratch and destroy sensitive components.

Quite apart from the presence of sensitive equipment, offices and schools should be considered a sensitive environment because of the people who work in them. Often the work is tedious and the working environment may be hot and stuffy. Under these circumstances the workers, whether they be typists or students, may welcome any excuse to go home. The presence of pests may provide such an excuse. In planning effective, acceptable pest management programs in these premises, it is important to recognize the various factors which favour pests as well as factors which make eradication or prevention of pests difficult.

Factors Favouring Pests

Factors Favouring Pest Entry

- Food and drinks for cafeterias or vending machines may serve to introduce pests.
- Packed lunches and other personal possessions of workers and students may contain pests.
- Pests may enter from adjoining buildings through cracks or conduits in common walls.
- Pests may enter through doors and windows.

- Grass and foundation plantings around buildings provide cover from which pests may invade.
- Exterior lighting may attract night-flying pests.
- Pests may be brought in on plants.

Factors Favouring Pest Survival

- Warm buildings.
- Food supplies in cafeterias, canteens and vending machines (including garbage).
- Water supplies in bathrooms, kitchens and in drinking fountains.
- Numerous harbourages for pests to hide.
- Contract cleaning services may be inadequate.

Factors Favouring Pest Dispersal

- Conduits for water, electricity and heating or cooling systems allow lateral and vertical movement of pests within buildings.
- Lift shafts and stairwells provide vertical access.
- Corridors allow lateral movement.
- Ceiling voids allow concealed movement of pests.
- Crumbs and lolly papers dropped by workers and students provide pest feeding opportunities away from cafeterias and playgrounds.

Factors Making Pest Management Difficult

- Occupants of infested areas may include children.
- Classrooms and open offices with large numbers of occupants are classic scenarios of pests.

- Computers and other electronic equipment are sensitive to pesticides as well as pests.
- Schools in particular may not allocate sufficient funds for an adequate pest management program.

Planning a Pest Management Program

Pest infestations in cafeterias, canteens, boiler rooms and other utility areas in schools or offices can be approached in the same way as when dealing with restaurants and other commercial food service establishments. Care must obviously be taken to ensure that food and food contacting surfaces are not contaminated with pesticides but, since treatments will essentially be behind the scenes, the pest management program won't have the potentially high profile or liability implications as when treating the rooms where people work for long periods.

To minimize this profile and to reduce liability, it is best to implement the integrated pest management program which combines non-control agent methods with the use of low-impact insecticides.

This System, has been widely used in schools and offices where it has achieved excellent results with minimal disturbance of occupants. The System consists of the following steps in the sequence that they would take place:

1. Obtaining management co-operation.
2. Inspection of premises.

3. Developing recommendations for non-control agent measures.
4. Developing recommendations for control agent treatments.
5. Obtaining co-operation of on-site personnel.
6. Implementation of initial treatments.
7. Implementation of follow-up treatments.
8. Monitoring of results.

In most cases, particularly where there are food service facilities on the premises, re-infestation will occur and the above sequence would need to be repeated. In effect, it becomes a cyclical process but the details of each cycle will change as the pest situation changes. In the first cycle of an infested area the focus will be on pest eradication, but in subsequent cycles will be on pest prevention.

1. Obtaining Management Co-operation

Management co-operation will be essential in order to gain site access during off hours and to open lines of communication with kitchen staff, cleaning and maintenance workers, grounds maintenance people and others whose help may be necessary.

Without co-operation at the highest level, it is unlikely that others will co-operate. To achieve management's co-operation, it is usually sufficient to point out the benefits of a pest management program in terms of maintaining a wholesome school or office environment free from complaints and absenteeism caused by pests and the diseases they might carry.

2. Inspection of Premises

An initial inspection of the premises, both inside and outside, is necessary for the purpose of identifying the type and extent of any pest problems and any factors contributing to those problems. For most areas the inspection can best be conducted during off hours to avoid disrupting activities, particularly when the use of pyrethrum aerosols may be necessary to flush pests from hiding places. However, in kitchen areas and computer rooms it may also be necessary to inspect during working hours in order to question staff about pests and to observe any undesirable operation procedures (such as taking food or coffee into computer rooms).

The findings, including locations of pest harbourages, pest entry points and potential sources of food and water for pests should be recorded to help form a baseline for future comparisons. In addition, data that can help in operational planning should be recorded, such as the names of key contacts, times when the building is open, cleaning schedules, grass mowing schedules, and servicing schedules for computers or other equipment that may harbour pests. Situations that may make pest eradication difficult should also be recorded, such as locked files and lockers.

In situations where there have been reports of biting pests, the inspection should be particularly thorough in order to show proper concern and also to determine whether the pests are real or imaginary. It is quite common for workers in offices to

report bites from imaginary pests, such as ‘paper fleas’ or ‘cable mites’. If no biting pests are found, but complaints of bites or itching continue, inspection for other environmental causes could be conducted. Other non-pest environmental causes include dust particles and static electricity. In some cases, bites may be caused by fleas, mites or lice, but where these are living on the person or his clothing they constitute a medical problem and should not be dealt with by the pest management contractor. There are also many medical conditions unrelated to pests which can cause itching which is sometimes confused with insect bites. However, if biting pests are found which spend part or most of their life off their victims, such as fleas and mosquitoes, then plans can be made to treat the premises to alleviate the problem.

3. Developing Recommendations for Non-Control agent Measures

Based on the inspection, a range of non-control agent pest management measures can be developed into recommendations for the client. Many of these recommendations will be for implementation by the client or by other contractors, such as maintenance contractors. But some, such as caulking crevices used by pests or using sticky traps, can be implemented by the pest management specialist. These non-control agent recommendations might include the following:

- Installing tight, self-closing exterior doors.
- Caulking crevices around doors, windows and vents.

- Fitting insect-proof screens on windows and vents.
- Draining stagnant water from nearby mosquito breeding grounds, including drip areas under air conditioners.
- Cleaning gutters and outside drains.
- Eliminating bird roosting sites.
- Trimming or removing foundation plantings, creepers and overhanging trees,
- Keeping grass short, especially along fence lines.
- Establishing a bare strip of gravel or concrete around the foundation of the building.
- Eliminating organic mulches from outdoor plantings and indoor planters and substituting crushed shell, stone or gravel.
- Picking up litter around buildings.
- Keeping rubbish bins closed and emptying and cleaning them frequently.
- Replacing exterior mercury lamps with sodium vapour lamps which are less attractive to flying insects.
- Caulking or patching crevices in walls or floors, especially around plumbing fixtures in food handling areas,
- Repairing plumbing leaks and reducing condensation problems.
- Improving food and waste handling in kitchens.
- Improving floor cleaning, especially vacuuming the edges of fitted carpets in offices.
- Disallowing overnight storage of food materials in school lockers.

For computer rooms, most of the pest management measures should

be non-control agent, including the following:

- Prohibiting food and drinks.
- Sealing across voids which connect with other rooms, including ceiling, wall and sub-floor voids.
- Screening vents (using 40 mesh screen to keep out small flies).
- Prohibiting potted plants from the computer room and surrounding areas,
- Placing sticky traps on the floor or double-sided sticky tape round the computer base.
- Wrapping double-sided sticky tape around power lines leading to the computer (this can also be done for lines leading to word processors, desktop terminals, etc. to prevent insects crawling up them).
- Removing vending machines and other food facilities from the vicinity of the computer room.
- Maintaining a separate, clean, well-maintained supply room for computer supplies.
- Designating someone to inspect all incoming computer supplies (especially paper goods) and to reject infested items.
- Limiting access to the computer room to reduce the risks from pests carried by people.

Where there is no separate computer room and for desktop terminals and other electronic equipment in general office or computer laboratory areas, some of these non-control agent measures will not be feasible. Nonetheless, as far as possible these areas should be kept clean, closed and food free. In addition, areas housing computers should be kept at moderate

temperatures and humidities, because high temperatures and humidities will favour insect breeding and increase activity and hence the likelihood of them crawling into equipment.

As already mentioned, most of these measures are for implementation by on-site personnel or by other contractors, but the pest management specialist has a role to play in defining and prioritizing these non-control agent measures.

4. Developing Recommendations for Control agent Treatments

Recommendations for control agent treatments will be based on the findings of the inspection and they will be customized to the particular pest and the sites of use. Existing or potential problems from control agents already present in the air of offices and schools should be recognized. These control agents include gases from cigarette smoking or heating systems, petroleum solvents from furniture and floor cleaners, formaldehyde from resins (used in particle boards desks, shelves and cabinets) and chlorinated solvents used in cleaning typewriters. Many of these control agents are capable of causing eye, skin and lung irritation, organ damage and a multitude of mild symptoms, including headaches and nausea. The problem is worst in modern, energy efficient buildings.

Because of the possibility that pesticides will be blamed for ill effects arising from control agents already present in the building, it is essential to choose pesticides which

have low volatility, which do not leave lingering odours, and which have a good safety record. A vast range of products meet these requirements, but it is often preferable to apply any pesticide when people are not present. This is because there have been many cases of hysterical behaviour in offices and schools when pesticides have been applied, particularly when the pesticides have strong odours. Even when the pesticides are odourless, even when water alone is applied, and even when the technician has only drilled holes prior to injecting insecticide, there have been cases of occupants feeling nauseous because of the foul smell, and even fainting. Thus, while it is legal to apply products in the presence of people (provided children do not contact treated surfaces until the spray has dried) it is less contentious to plan all applications during off-hours.

For pests which nest outdoors and invade offices and schools, recommendations should focus on treating the nests when these can be located, provided they are on the clients properly. Nests of ants can be sprayed or dusted. For those ants which have deep gallery systems, drenching treatments using 5-10 litres on each mound are highly effective.

Where pests such as fleas are a nuisance over large expanses of grassed areas around schools, area spraying with insecticide is recommended. For occasional invaders, perimeter spraying can be recommended around foundations,

eaves, doorways, windows and vents. In addition, control agents can be recommended for injection of pest entry points, such as weep holes and exterior crevices under thresholds and around plumbing and air vents. For insect pests which have already entered or been carried into offices and schools, the following four types of insecticide application can be recommended:

- Treatment of exposed insects such as ants or fleas with directed contact sprays.
- Spot treatments of spots or bands around doorways, counters, plumbing fixtures, etc., across which insects must crawl in their search for food or water, using fan sprays of.
- Crack and crevice applications to harbourages where cockroaches or other insects may hide, using low-pressure pinstream injections.
- Deep treatment of wall and ceiling voids, conduits and other voids where insects may nest or retreat, using hand or power applications. For machinery voids, including food mixers and vending machines, insects can be flushed out with pyrethrum aerosols after first treating surrounding surfaces or potential new harbourages with appropriate products.

In computer rooms and near remote terminals or other sensitive electronic equipment, no sprays or dusts should be allowed to enter the air, and no insecticides of any kind should be put inside the equipment. For these situations, treatment of

structural cracks and crevices and voids with products can be recommended, provided there is no risk of insecticide coming out and contaminating the equipment. To totally avoid risk of drift or bounceback, control agents can be applied by paintbrush to crevices and spots that insects will contact. The pest management specialist should warn the client not to use over-the-counter pesticides in computer rooms.

Of the various types of insecticide application for indoor insects such as cockroaches, which hide a lot and avoid light, treatment of cracks and crevices and voids will constitute the majority of the recommendations. In cases where the occupants report imaginary pests, such as paper fleas, but no pests have been found in the inspection, there should be no recommendations for applying pesticides. Too often, complaints about imaginary pests can turn into complaints about imagined ill effects from pesticides. Instead, the application of anti-static compounds might be considered or the client should be told to seek advice from other specialists regarding humidity or dust levels, etc.

5. Obtaining Co-operation of On-Site Personnel

As can be seen from the recommendations for potential non-control agent measures, a lot of co-operation from on-site personnel is necessary to deal with pests effectively and safely. Improvements in site hygiene, food storage, waste handling and building maintenance

can be achieved by directives from the building management to those responsible for these functions.

Before conducting any pest management measures which involve opening lockers, desks or other places where personal property may be present, the building occupants should be given adequate written notice to allow time for removal of such property. Where policies do not allow involuntary opening of lockers, and where voluntary opening cannot be obtained, the PCO must anticipate and inform the client of the continuing possibility of pest problems.

To help deal with any future questions on pesticides, the pest management PCO should inform appropriate management personnel in office and schools about what pesticides will be used.

6. Implementation of Initial Treatments

If the inspection reveals a current pest problem, steps should be taken to implement the recommended non-control agent and control agent measures. Most of the non-control agent measures are preventive in nature and will take a long time to implement. If the pests represent an imminent threat to people or property, the initial treatments will focus on the use of control agents to quickly eliminate these pests.

For such an offensive against established pests it is important to commit sufficient manpower to treat the whole infested area in a relatively

short period of time. This will minimize any disruption of activities in the office or school, but more important it will increase the chances of eradicating the pests. This is because a thorough treatment in a short period will not allow pests to escape to untreated areas and move back to treated areas when the effects of the treatment have worn off.

With fast-breeding insects, such as German cockroaches, it is essential to achieve a fast population reduction because research has shown they are much less likely to repopulate after such a crash. Programs of slow kill always fail because the insects can breed as fast or faster than they are killed.

Prior to the initial treatments, notice should be given to all people who must carry out any essential preparation. This is particularly important in kitchen areas where any food should have been covered, garbage disposed of, and floors, drains and sinks cleaned and dried. By making it harder for pests to find food and water, they are more likely to move around and be killed by pesticide deposits or traps used in the initial treatments. Likewise, if food and water are removed from the vicinity of computers, any pests that find harbourage inside the computer for its warmth and darkness will have to move to new harbourages nearer food and water.

Whatever products are used, all applications should be in accordance with label directions and records

should be kept of all pesticide applications.

7. Implementation of Follow-up Treatments

Follow-up inspections should be made from one day to two weeks later to check on the success of initial treatments. For long-established infestations of stubborn pests, such as German cockroaches, it is almost inevitable that an inspection after one or two weeks will reveal some survivors and a retreatment should automatically be scheduled two to four weeks after the first. In such cases it is important to establish why they survived and to modify the follow-up treatment accordingly. In most cases, survival is because one or more pest harbourages were missed during the initial treatment. The main purpose of follow-up treatments is to deal with these missed harbourages rather than to re-treat harbourages which are already treated.

For ants, it is best to wait a week or more to determine whether any have survived and started nest activity again.

Where occasional invaders are likely periodically to invade the buildings a program of monthly or bimonthly follow-up perimeter treatments may be necessary, depending on climate and pest pressure.

In computer rooms and for desktop terminals and other electronic equipment vulnerable to pest invasion, the protective sticky traps on floors and sticky tape around cables should be replaced regularly.

8. Monitoring the Results

The sticky traps and tape used to protect computers, etc., will serve as monitoring tools, since they will capture and hold pests for later identification and action. Sticky traps can also be placed in areas previously found vulnerable to pests, such as kitchen and storage areas, and behind vending machines.

For most offices and schools, regular checking and/or replacement of sticky traps, together with the use of flushing pyrethrum aerosols or dust to check potential harbourages will provide the information necessary to prevent pest problems. Staff who work in food preparation areas and maintenance and cleaning workers should also be regularly asked about any pest sightings.