

HOUSES

Introduction

Family houses are subject to most of the pest problems found in buildings where people live and work. By their very nature, houses provide a hospitable environment for people. This environment can inevitably support pests, including commensal rodents and scores of different types of arthropods. These arthropods range from insects which damage property, such as ants, pantry pests and carpet beetles, to pests which can hurt people, such as fleas, wasps and spiders. Many pests in houses are just occasional seasonal invaders, but others can become permanent residents, including cockroaches and silverfish.

While the pests may be similar to those in or around other buildings, there are several aspects of houses which make dealing with pest problems different, and often easier, than for other buildings. For example, single family homes are generally less subject to invasion by pests from neighbouring homes than in home units or townhouses.

Perhaps the most important thing for pest management specialists to remember when dealing with homes is that in most cases the homeowners have actively chosen to have something done about pests. In home units pest management usually involves dealing with the management of the complex, rather than individual occupants, who usually have little say in what is done. Likewise in aircraft, hotels,

hospitals and offices, the management decides on pest management services and the respective passengers, guests, patients and office workers are only indirectly involved in the matter. But in private homes there is no management or legal requirement for the occupants to do anything about pests.

Typically, homeowners seek professional pest management services when they independently become aware of a pest problem or a potential problem. In some cases they may already have attempted to solve the problem themselves, but failed. In either case the basis exists for a good working relationship between the homeowner and the pest management specialist, because the homeowner recognizes he has a problem and the specialist has the answers. Moreover, unlike some huge commercial accounts such as hospitals and food processing plants, where lines of communication and internal disputes may make work difficult, communications between the contractor and the homeowner can and should be fast and easy.

Where communication and service is good, it is common for a homeowner to continue using the same pest control company for many years. This contrasts with the annual turnover of many commercial accounts because of clients who choose on the basis of low bids rather than best service. To some

extent the contrast is inevitable because a private home represents for most people their greatest financial asset and the place they house their most valued possessions. Hence, a PCO who respects and helps protect the home and its occupants and contents is a kind of continuing insurance.

Before planning pest management in homes, it is important to understand the various factors which favour pests and those factors which can sometimes make pest management difficult to accomplish.

Factors Favouring Pests

Factors Favouring Pest Entry

- Food provisions are a means of introducing cockroaches and pantry pests.
- Pests can be carried indoors on yard and patio furniture,
- Pests can be carried indoors on firewood.
- Pets may introduce fleas to the home.
- Ornamental foundation plantings provide pest harbourages and make invasion more likely.
- Numerous doors, windows and vents facilitate pest entry.
- Telephone and electricity lines and overhanging trees provide access to homes.
- Exterior lighting may attract insects and increase the probability of invasion.

Factors Favouring Pest Survival

- Warm environment
- Food of many types, including human food, garbage, textiles, etc.
- Water from taps, toilets, condensation and rain leaks.

- Numerous pest harbourages, including furnishings, appliances, wall voids and cupboards.

Factors Favouring Pest Dispersal

- Pets can spread fleas around a home.
- Conduits for water, electricity and heating or cooling systems allow concealed movement of crawling pests.
- Ceiling and wall voids allow easy movement of pests.
- Use of aerosols containing pyrethrum or other repellent insecticides by the homeowner may have scattered nests.

Factors Making Pest Management Difficult

- Houses may be occupied 24 hours a day.
- Children may be present.
- Pets may be present, including aquarium fish.
- Some occupants may be sick and/or vulnerable to some pesticide vapours.
- Cupboards! attics, sheds and garages may be very cluttered.
- Carpets, furnishings and other contents may be susceptible to damage by some pesticides.
- Hygiene may be poor.

Planning a Pest Management Program

The details of pest management programs in homes will vary from place to place, depending on the pests, the nature of the building and contents, and relevant external factors such as climate, soil type and yard vegetation. The age of the home may be relevant because of different construction practices. For

example, modern homes often have hollow internal doors which provide nesting cavities for ants and cockroaches. However, older homes are often overgrown with shrubs and trees which encourage pests.

The type of pest and why it became a problem is of crucial importance. In the case of German cockroaches, an infestation may have been the result of an isolated introduction on a supermarket grocery bag. In this case the pest management effort will essentially be aimed at eradicating this infestation, and no future measures may be needed. However, in the case of pests which live outside and keep invading, such as ants, and carpet beetles, it may be necessary to plan a long-term program of protection, including the repeated application of insecticides.

In both these cases the potential pest problems are unavoidable and not related to the lifestyle of the homeowner. However, in the case of homeowners who keep dogs and cats that roam outside as well as in the home, problems from fleas are part of the price of being a pet owner. Likewise, homeowners whose lifestyle includes buying from food stores where there is not an adequate pest management program, and where turnover of specialty items packaged without preservatives is slow, must expect periodic problems of mouldy, insect-infested food. For the pet owners and the people who choose to buy suspect food, pest management programs can reduce the impact of pests.

Whether the pest problems are self-inflicted or not, and whether the objective is eradicating an existing problem or preventing future problems, the best approach is to implement an integrated pest management program. This System combines non-control agents measures with the use of pesticides specially suited for use in and around homes. For houses, the System involves the following steps:

1. Obtaining homeowner co-operation
2. Inspecting the premises.
3. Developing recommendations for non-control agent measures.
4. Developing recommendations for control agent treatments.
5. Instructing homeowners regarding specific duties.
6. Implementing initial treatments.
7. Implementing follow-up treatments where necessary.
8. Monitoring of results.

1. Obtaining Homeowner Co-operation

The homeowner's co-operation will always be necessary to carry out an integrated pest management program, and the more the homeowner co-operates the more successful the program will be. At the very least, co-operation is needed to gain access to the site for inspection and subsequent treatments. In addition, the homeowner can assist by providing information that may help in developing recommendations. The homeowner can also help in implementing some of the recommendations and in preparing the home for pesticide treatments.

In the case of many other contracted services in houses, such as plumbing or electrical work, the homeowner usually plays no active role. But pests pose a greater challenge than a leaking pipe, a broken wire or other work involving inanimate objects. Pests are living, breeding, mobile problems. The relationship between the pests, the building and the occupants is not static, it is dynamic. The occupants are often part of the problem, so they should be persuaded to be part of the solution.

2. Inspecting the Premises

An initial inspection is necessary to identify the type and extent of any pest infestation and any factors which contribute to the pest problem or which might limit pest management options. The inspection will involve visual examination of the premises and questioning of the homeowner. The following examples illustrate the kind of relevant data that can be obtained from the homeowner:

Pantry Pests:

- When pests were first noticed by homeowner.
- Where pests were first noticed.
- What food items have already been discarded.
- What food items are oldest or least used.

German Cockroaches:

- When and where pests were first noticed by homeowner.
- Where they have been seen recently.
- Where the homeowner thinks they came from.

- What measures the homeowner has already taken against them.

Fleas:

- What pets are present.
- Where do the pets travel in the home.
- Where are the pets' main indoor resting areas.
- Where do pets rest outside.
- What treatments have the pet already received, e.g. collars, dips, shampoos.
- Has the pet ever become sick following its treatment.
- How often and how well are the carpets vacuumed.
- Has the home been treated before against fleas.

Ants:

- Where and when they have been seen by homeowner.
- How many are seen indoors each day.
- Whether or not winged ants have been seen indoors.
- The location of current moisture problems (e.g. roof or plumbing leaks).
- The location of past moisture problems.
- Proximity to trees, especially hollow hardwood trees.

Occasional Invaders:

- Where and when they have been seen by homeowner.
- How often doors and windows are left open, including garage doors.
- What exterior lights are used.
- Where and for how long is firewood kept indoors.

The inspection should also note any potentially sensitive situations.

These include the presence of tropical fish, sick residents and any pre-existing damage or stains on wall coverings, carpets or other surfaces which may later be touched or treated by the technician. The various findings should be recorded to form a baseline for future comparisons and to help in developing recommendations for dealing with the pest problems.

3. Developing Recommendations for - Non-Control agents Measures

Various non-control agents measures may help alleviate a pest problem, most of which can be carried out by the homeowner or other contractors. These measures include the following:

- Disposing of infested food (or pet feed) to eliminate the prime sources of a pantry pest.
- Changing sources of food purchases to reduce future infestations.
- Disposing of packaging materials, such as grocery bags, which might harbour pests.
- Keeping food refrigerated or in insect-proof
- Avoiding leaving food or dirty dishes exposed overnight.
- Keeping garbage in covered containers.
- Installing tight exterior doors and keeping doors shut when not in use.
- Caulking crevices around doors, windows and vents.
- Fitting insect-proof screens on windows, attic vents and other openings.
- Draining puddles, including drip areas under air conditioners to reduce mosquito breeding.
- Cleaning gutters and drains to reduce fly breeding.
- Eliminating bird roosting sites and removing old nests in which pests breed.
- Trimming or removing foundation plantings, creepers and overhanging trees to reduce pest harbourages and entry routes and to reduce moisture levels around the base of the home.
- Keeping grass short to reduce cover for pests.
- Modify herbaceous borders to reduce plants prone to insect infestations, especially flowering plants supporting carpet beetles.
- Eliminating bark or other organic mulches from outdoor plantings and substituting crushed shell, stone or gravel.
- Establishing a bare strip of gravel or concrete around the foundations to discourage invasion by yard insects.
- Avoiding bringing infested flowers indoors.
- Replacing exterior mercury porch or security lamps with sodium vapour lamps which are much less attractive to flying insects.
- Eliminating contact between wooden elements of construction and the soil.
- Repairing leaks in the roof.
- Repairing plumbing leaks and reducing condensation problems.
- Regularly vacuuming carpets and upholstery and removing lint accumulations from the edges of the carpets and crevices between floorboards.

- Storing firewood outdoors away from the house. Which of the above recommendations are relevant will depend on the particular pest and site situation.

4. Developing Recommendations for Control agents Treatments

Recommendations for control agent treatments will be based on the findings of the inspection and should be customized to the particular situation. No two houses are alike, and the recommendations should reflect the differences in the pests and site situations, as well as the different wishes or concerns of the homeowner. For instance, where any occupants have respiratory problems there should perhaps be a greater emphasis on non-control agent measures, and little or no use of pyrethrum and pyrethroid insecticides which are irritant. However, one should keep in mind that the presence of some pests, including cockroaches, can cause allergic respiratory reactions, such as asthma attacks. The containers prior to use.

The careful use of non-irritant pesticides, to eradicate these pests provides a clear benefit in such situations.

To reduce the risk of staining carpets or other textiles, samples should be taken and tested, or inconspicuous areas in wardrobes or under furnishings should be tested with the candidate pesticide. Alternatively, pesticides which have a good record and which have labels indicating safety to fabrics, should be used.

Where ants or other pests are not nesting in the house but merely foraging from outdoors, the focus moves to outside treatments. For ants, the recommendations will include treating the nests (if these are on the client's property) using sprays or dusting. For ants which have deep gallery systems, drenching treatments are highly effective.

Where a completely odourless treatment is wanted by the homeowner, control agents can be used for whole-yard treatment against ants or fleas. For occasional invaders such as spiders, a perimeter application around the foundation, doors, windows and eaves can be carried out. Additional protection against crawling pests can be provided by dusting crawl spaces and weep holes.

Where pests have already entered or been carried into homes, the following four types of insecticide application can be recommended:

- Fan sprays directed at exposed insects such as ants or fleas for contact kill. For fleas, entire carpets must be treated as well as upholstered furniture and pet resting areas. These treatments will also provide residual protection.
- Spot treatments around windows, doorways, shelving, counters, plumbing fixtures, wardrobes, furniture, rug edges and cabinets for residual control of cockroaches, carpet beetles and occasional invaders which cross treated surfaces foraging for food, water or shelter.

- Crack and crevice applications to harbourages where cockroaches and other insects may hide using low pressure pinstream or injection- tube methods.
- Void injections into wall voids, ceiling voids, conduits, plumbing voids, attics, etc. for hidden insects, including silverfish, ants and cockroaches.

In many cases more than one type of indoor application will be necessary. Moreover, with many pests, including ants and fleas, it will often be necessary to treat outdoors as well to reduce the likelihood of reinvasion.

5. Instructing Homeowners Regarding Their Specific Duties

Many of the non-control agent measures, including improving site sanitation, food storage and building maintenance, are best conducted by the homeowner. However, it is the job of the pest management contractor to point out what needs to be done by the homeowner and to explain how it will help and the consequences of not doing it. For instance, if the homeowner does not repair leaks in the roof or clear clogged gutters, the resulting damp wood will encourage ants. In the case of fleas, unless carpets are thoroughly vacuumed regularly and the pets disinfested by the homeowner or veterinarian, the flea problems will soon return. In the case of carpet beetles, unless the homeowners screen their windows, remove lint accumulations and store woollens in sealed plastic bags, they can expect continuing damage.

Many of these homeowner duties may not be obvious and the contractor can build a lasting relationship by providing this kind of information to the homeowner. Sometimes this information can be transmitted in the form of homeowner information leaflets imprinted with the contractor's name to reinforce the contractor's identity.

Involving the homeowner in the program not only contributes to its success but it serves another vital function. It demonstrates that dealing with pest problems is not just a matter of spraying a miraculous control agent. Indeed, the more that homeowners believe in miracle cures the more likely they will be disappointed. In this regard it is important to advise homeowners about the results they can expect from a particular treatment, so they don't have false expectations.

False expectations are one of the main reasons for callbacks. Some homeowners complain because they were not warned about a pesticide odour. Many are also surprised and complain because their home is littered with dead insects following a pesticide application. Somehow they expected the living pests to simply disappear! Others complain because they did not know that they might keep seeing ants 10 days or more after a treatment. In the case of fleas, some new adult fleas may hatch from pupal cocoons several weeks after a treatment and they will not die until they have contacted surfaces treated with a residual insecticide. All these things can and should be explained to the

homeowner, and then they will be in a better position to report any abnormal results.

In addition to providing information about the pests and about non-control agent measures, it is also necessary to tell the homeowner about any essential preparation prior to carrying out pesticide applications. These instructions would depend on the pest problem but they might include the following:

- Empty and clean all kitchen cabinets.
- Empty and clean bathroom cabinets, medicine cabinets and linen cupboards.
- Check containers of spices, flour, cereals, etc. and if these show signs of infestation by stored product insects, dispose of them.
- Place open food or drink in the refrigerator or oven.
- Place other items removed from kitchen or bathroom cabinets in another room or, in the case of dishes, pans and cutlery, stack them on the kitchen table covered with a plastic sheet or cloth.
- Preferably remove children and pets from the home during pesticide treatments.
- Cover fish tanks and air pumps serving fish tanks with a clean plastic sheet or cloth during the application of pesticides. (Turn on air pumps after spray has dried).
- Dispose of all garbage.
- Vacuum all carpets, especially the edges of fived carpets, and dispose of the vacuum bag in the case of flea infestations.
- Don't use pyrethrum aerosols before the contractor's treatment.

- Remove shoes, etc. from floors, and toys from the floor of childrens' rooms.
- Tidy sheds, store rooms and garages to allow access to the floor and corners.
- Arrange for pets infested with fleas to be treated.

6. Implementing Initial Treatments

Adequate notice should be given when initial control agent applications will be made so that the homeowner has time for any essential preparation, such as site cleanup. In addition, some of the long-term non-control agents measures can at least be started, including repairing leaks and sealing and screening against pests.

The more non-control agent measures that can be implemented prior to control agent applications, the less likely reinvasion will occur. However, in most cases the homeowners want fast relief from a pest problem and with a well-established infestation, this can only be achieved by professional pesticide applications.

To help deal with any questions or concerns about the pesticide applications, the contractor should tell the homeowner what products will be used. Whatever products are used, all applications should be in accordance with label directions and records should be kept of all pesticide applications.

The treatments will vary with the situation. However, in all cases the procedure should be methodical to avoid duplication and to minimize

backtracking over treated grass or carpets. Where preparation by the homeowner has been inadequate, a decision should be made before making any applications whether or not to reschedule the job or to alter the treatments, guarantees or warranties to suit the circumstances. Before leaving the treated premises, the homeowner should be reminded of any special precautions, such as not allowing pets or children to contact treated surfaces until they have dried completely. In view of the great variation in drying time of surfaces such as carpets (because of variances in pile height and density as well as variances in temperature and humidity), it is unwise to suggest any specific number of hours before pets and children can go on treated surfaces. Following residual application against fleas, homeowners should be told not to clean carpets for at least one week to minimize removal of the insecticide before it has done its job.

7. Implementing Follow-up Treatments Where Necessary

Ideally follow-up treatments should be planned, rather than made in response to a complaint. Callbacks can be reduced by providing information to the homeowner so that the results of the initial treatment cause little surprise. Most callbacks arise in the few days following the initial treatment because some pests are still alive. If the homeowner had been told it would take 10 days, 30 days, etc. for a particular infestation to succumb, these premature callbacks would be avoided and the contractor's credibility would remain

high. It is a good practice for the PCO to tell homeowners at the time of the initial treatment that they will call the homeowner a specific number of days after the initial treatment to check on results. This follow-up phone call maintains positive communications between the contractor and homeowner and discourages premature callbacks.

For some pests it can be anticipated that follow-up treatments will be necessary and this should be pointed out to the homeowner at the beginning. While fleas can usually be eradicated with a single treatment (particularly when the yard is also treated), many contractors find it expedient to offer a two-treatment program. This is good practice when experience has shown that single treatments are often insufficient because of flea invasion pressure or other reasons.

German cockroaches usually require more than one treatment to eradicate a well-established infestation; a follow-up treatment should be automatically scheduled no later than four weeks after the first and no sooner than one week later. The main purpose of the second treatment will be to treat harbourages that were missed the first time, rather than to re-treat harbourages that were previously treated.

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

Where occasional invaders are likely to periodically invade the building, a

continuing program of monthly, bi-monthly or quarterly follow-up perimeter treatments may be necessary.

Since it can be expected that many of the factors influencing the pest situation will change from season to season and from year to year, the follow-up treatments should be adjusted to the changing situation.

8. Monitoring of Results

The results of the initial treatment and any follow-up treatments can be monitored by inspections and by arranging a feedback from the homeowner.

Sticky traps can be routinely used for monitoring pests, and these can be placed in areas inaccessible to children or pets or inside tamper-proof rodenticide bait stations. Traps can be placed on one visit and inspected and replaced on subsequent visits. In addition, pyrethrum aerosols or dusts can be used to check potential harbourages for any hidden pests. Other means of checking for the re-appearance of insects include looking inside light fittings, checking inside window sills and looking for insects trapped in spider webs.