This factsheet is about the hazards of insect infestations. In the next *Daily Hazard* we look at the hazards of the chemicals used to treat them.

Tenants in several London boroughs have had successes in forcing councils to undertake adequate treatment. In Haringey, the Broadwater Farm tenants have gone further and taken pest control into their own hands.

Meanwhile, the Centre has had a number of reports of misuse of pesticides in offices. The story usually begins with a contractor spraying around workers at their desks, and ends with sick workers. And sometimes in pursuit of a non-existent bug.

Wherever infestations occur, the approach must be to eliminate the conditions which allow infestation; insist on information and consultation; plan an effective programme; and prevent exposure to dangerous pesticides.

Pests

Insects are pests either because they bite you (fleas), or because they contaminate food with disease, or because they cause allergies (furniture mites, house dust mites). They thrive where people have created artificial environments which suit them. The warm heating ducts, hollow walls and floors, rubbish chutes, dampness and shoddy finish of tower blocks have provided an ideal environment for cockroaches and pharaoh's ants. Race and class stereotypes blame the "dirty tenant" for the results of poor housing design and lack of maintenance and services.

The Insects

Cockroaches

Two frequent types, the German and Oriental. Their flattened body enables them to squeeze through small cracks. They don't make nests, but congregate in suitable places – "harbourages" – such as holes near pipes, or piles of packaging. They breed quickly and protect their eggs in capsules which survive pesticide applications. They carry diseases ranging from salmonella to typhoid and their sheer numbers can make them a frightening pest.

Pharaoh's ants

A tiny reddish ant which thrives in warm damp conditions. Their small size enables them to get into apparently sealed food packaging, and sterile packages in hospitals.

Mites

They like damp places. Various types infest food, furniture (feeding on natural fibres in upholstery) or mattresses (feeding on skin flakes). They cause allergies – food mites cause dermatitis, house dust mites cause asthma.

Silverfish

Like warm damp places, come out at night to feed on mould and carbohydrates. Harmless.

Bedbugs

They're smelly and they bite, but they don't carry disease.

Fleas

More likely to be dog or cat fleas than human. Controllable by frequent cleaning. If you have a "flea" infestation and there are no insects visible, you may have:

"Cable-bug" or "Phantom insect bite"

You are getting what seem to be insect bites, and no insects can be found. Two causes have been suggested for this:

Static electricity. Walking on carpeted floors builds up static in your body. The charges "leak" away unnoticed, leaving a tiny irritable rash like a bite. Other floorings may also generate static, and so do VDUs.

Carpet fragments. Heavy duty workplace carpets shed invisibly small spikes which work their way through clothing and "sting" you. Anti-static carpets release most fragments.

What you can do. . .

In the Workplace

Law

Health and Safety at Work Act Section 2: obliges employers to ensure employees' health, safety and welfare.

Control of Pesticides Regulations 1986: users must take all reasonable precautions to protect the health of human beings.

Control of Substances Hazardous to Health Regulations in force October 1989. For both employees and non-employees, employers must:

- Assess the health risk from a hazardous substance
- Prevent or control exposure
- Monitor exposure "where requisite", ie where a limit may be exceeded
- Provide information on health risks and precautions

Action

Get a survey and report on the infestation by an independent environmental health consultant, not the treatment contractor. The report should specify:

- Pest species
- Extent of infestation
- Environmental causes of infestation, eg openings for rats, mice or birds (all carry insects); lack of cleaning; cracks and holes in warm places which provide harbourages); food sources.
- Methods of eradication. As far as possible these should avoid chemicals in favour of cleaning and structure/design solutions.
- Recommendations for future prevention, eg structure, hygiene, heating, ventilation, control of damp.

Get a written specification of work methods

- Use least toxic chemicals in the smallest effective quantities
- Apply chemicals only where actually necessary to reach pests
- Use chemicals in the least dangerous method of application
- No treatment while workers are in occupied areas
- Advance warning to workers
- Warning signs on approaches to treatment area
- After treatment have thorough ventilation and vacuum with type H industrial vacuum cleaner
- Air and surface-wipe tests after application, and no re-entry until chemicals are at 1/100th of the occupational exposure limit or other recommended limit. 1/1000th is a safer margin.

If you're poisoned

- get out of the office
- ensure the illness is recorded in the workplace Accident Book
- see your doctor and try to get tested for the chemical used
- don't go back in until there has been full ventilation and cleaning.

In the community

Law

Infestations are a Statutory Nuisance under *Public Health Act 1936* Section 92. Under Section 99 of the Act, an individual can go to court to force a local authority to deal with a statutory nuisance.

Consultation: under *Housing Act 1980* Section 43 every local authority must have a procedure for consulting tenants on matters of housing management, including major works on estates, and must publish the procedure.

Action

If there is an active tenants' association, use it. The Environmental Health Department has a duty to inspect premises "prejudicial to health". Get onto them by letter and follow up by phone.

If there is no action, you will have to put pressure on through councillors. You will need to:

- Raise awareness among tenants through meetings or leafleting.
- Demonstrate the extent of infestation by conducting a survey. Cockroaches can be caught using sampling traps: the most effective ones are baited with pheromones (cockroach sex hormones). Get the traps into a sample of the flats for 1–2 weeks. Write up the results and arrange a meeting to present the results to councillors. Take some filled traps with you!

Demand

- Proper identification of the nature of the infestation and its causes, and a plan to deal with it. "Block treatment" is almost always necessary: the entire building should be treated in the shortest possible period, moving inwards from the outside.
- Full information on the methods to be used, followed by a public meeting to discuss them. Information must be provided in all community languages.
- If the work involves piercing walls, check whether they're made of asbestos.

CASES

The office

Monthly spraying of a poorly cleaned office led to a build up of pesticide-laden dust but left workers still bitten. The union branch (MSF) successfully demanded proper cleaning: since when, no bites. The pest was never identified and the pesticide company admitted their product was being misused. Cleaning and identification should have been the first steps.

The hospital cleaner

This one got into the official HSE records: cleaning after a treatment, this worker was poisoned by bendiocarb. The HSE pointed to poor training and supervision.

The schoolteachers

Treated with organophosphates before the weekend and left shut, the building poisoned staff on Monday. Two people were hospitalised. The pesticide had been used according to the manufacturer's recommendations. Investigators concluded that these were based only on outdoor use; they also kept staff and pupils away till pesticide levels were 1/100th of the "safe" level.

The tenants get block treatment

Eight years of pressure by a Camden tenants' association finally led to block treatment of cockroaches. Instead of piecemeal spraying in homes, holes were drilled to dust insecticide below floors, behind walls, and in the heating ducts and rubbish chutes. Eighteen months later, the roaches haven't reappeared.

The tenants take over

The community organisations on Broadwater Farm estate ran a successful campaign for block treatment of cockroaches. They insisted that the pest control contractors employ and train local people. Once trained, the locals set up a company which maintains pest control on the estate and also works elsewhere.

Contacts

Health and Housing Group, tel 01-373 8028. Independent environmental health officers.

Beta Pest Control ("The Bugbusters"), tel 01-885 4992. Company set up by Broadwater Farm tenants. Contact them for information on campaigning – or for help with pest control in their area.

INSECT INFESTATIONS - 2:

INSECTICIDES

In Part 1 of this factsheet we looked at how to take action about insect pests in workplaces and housing. In this part we give more information about the insecticides to which workers and tenants are exposed by attempts to exterminate these pests.

WHAT DO WE KNOW ABOUT PESTICIDES?

There is no such thing as a totally non-toxic pesticide. It has been estimated that a complete assessment of hazards is only possible for about five per cent of pesticides. 'Government Approval' is no guarantee of safety.

Exposure limits for airborne contamination are drawn up on the basis of eight hour workplace exposures, not the longer exposures people get at home. They frequently turn out to be set too high. They are also based on the assumption that those exposed are healthy men of working age: children, older people and pregnant women may be more vulnerable, depending on the chemical, as may sufferers from asthma, allergies or eczema, weak livers or weak hearts or anyone otherwise not in perfect health.

Information about the pesticide's behaviour may be derived from outdoor use: its indoor behaviour may be different, for example it may disperse more slowly. In a school in the USA, contamination after a treatment with dichlorvos and the carbamate propoxur took 14 days to sink to acceptable levels: the manufacturers had said it would take three hours.

From October 1989 the Control of Substances Hazardous to Health (COSHH) Regulations will provide the right to information for employees or other persons on the premises. Health and safety representatives already have the right to information affecting health, under the Safety Representatives and Safety Committees Regulations. Get the Manufacturer's Safety Data Sheet (MSDS) and have it checked.

Look for the safest method of application. Air spraying is the most dangerous, surface spraying and dusting the next, baits the least.

THE SOLVENT HAZARD

If the pesticide is in liquid form, it will contain at least one other hazardous chemical in the form of a solvent. First, the active ingredient will have been dissolved in a powerful solvent such as xylene or toluene to form an emulsion concentrate. Then, before application, the concentrate is diluted in a carrier, which may be water (aqueous solution) or may be another solvent such as kerosene or white spirit. Aqueous solutions are less dangerous but there is still a solvent hazard.

THE PESTICIDES

The pesticides most often used fall into several groups: organophosphates, carbamates, organo-chlorines, synthetic pyrethroids and synthetic hormones.

Organophosphates

including fenitrothion, actellic (pirimiphos methyl), vapona (dichlorvos).

Organophosphorus insecticides can permanently damage the nervous system. They block the production of an enzyme, cholinesterase, whose job is to 'switch off' nerves after an impulse has been passed through them. Thus they poison by overloading the nervous system. People with low cholinesterase levels are more vulnerable: this may be due to the later stages of pregnancy, liver damage, or an inherited deficiency. Very young children also produce less cholinesterase.

Symptoms of organophosphate poisoning include: vomiting, diarrhoea, cold sweating, stomach cramps, tingling, shooting pains, salivation, headaches, numbness, insomnia, blurred or double vision, fatigue, confusion, anxiety, and irritability.

Organophosphates are absorbed through the skin and are as dangerous by this route as they are by swallowing or inhalation. Dilution for spraying, and use as a powder, can further increase the amount absorbed through the skin.

The usual test for organophosphate poisoning is to measure cholinesterase levels in the blood. But there are cases on record in which such tests did not reveal organophosphate poisoning.

Vapona (Dichlorvos). Extremely poisonous. Has caused asthma and neurological damage resembling multiple sclerosis. Easily absorbed through the skin. Very volatile, and therefore easily breathed in. A specified substance under the Poisonous Substances in Agriculture Regulations 1984*.

Fenitrothion. Very poisonous by mouth or skin. The Centre knows of several cases where office workers have been poisoned. A woman gave birth prematurely after her flat was sprayed. A link has been suggested with a rare children's disease, Reyes Syndrome.

Nuvanol (Iodofenphos). 'Only' moderately toxic.

Actellic. 'Only' slightly toxic. May be irritant. Evidence of reproductive hazard. Camden Council have recently stopped using actellic because of the possible hazard.

Carbamates.

Including Ficam (bendiocarb), and carbaryl. Carbamates produce similar effects to organophosphates, though the immediate effects of carbamate poisoning only last a few hours and the body quickly gets rid of the chemical. But the World Health Organisation has pointed out that little is known about the long term effects of carbamates on humans, and said that 'Users should be encouraged to be aware of the necessity to establish safe re-entry periods according to local conditions' - in other words, people should not be present during application.

Carbaryl may be able to cause birth defects and cancer. ***Bendiocarb*** is very poisonous.

Organochlorines

Include lindane(Gamma HCH).

Organochlorines accumulate in the body fat. Immediate effects include headache and nausea. Long-term effects include lethargy, poor memory, personality changes, epilepsy, anaemia, and probably cancer.

Synthetic Pyrethroids

Include permethrin, cypermethrin, alpha-cypermethrin, deltamethrin, phenothrin, tetramethrin. Widely promoted and seen as the 'safe' insecticide. In fact they vary widely in toxicity. Valued by pest controllers because of their quick 'knockdown'.

Deltamethrin is as poisonous as fenitrothion, and irritates eyes and skin. A specified substance under the Poisonous Substances in Agriculture Regulations 1984.*

Cypermethrin is almost equally toxic, can irritate eye and skin and may cause permanent allergy and eye damage. Some evidence that it causes cancer. Spraying of cypermethrin with workers present at a DSS office caused severe rashes, and breathing problems.

Permethrin. Moderately to very toxic. Can irritate skin and cause conjunctivitis. Some evidence that it may cause cancer.

Pyrethrins

Products include Drione and 4-Cide. These are extracted from plants, which doesn't mean they're harmless. They are fairly poisonous and can cause allergic skin reactions and dermatitis. Large amounts have caused liver damage and low-weight offspring in test animals.

Synergisers

Pyrethrins and pyrethroids are often mixed with another chemical 'synergiser' to intensify the effect. This is commonly piperonyl butoxide, which causes cancer in animals and may trigger other potential carcinogens.

Synthetic Hormones

Methoprene (marketed as Pharorid) imitates the hormone which controls growth in pharaoh's ants. It seems to be virtually harmless to laboratory animals. It is mixed in baits (consisting of liver, swiss roll and runny honey!) and the ants take it back to the nest where it destroys their breeding cycle. Methoprene has been acknowledged for several years as the most effective and least dangerous way of controlling pharaoh's ants.

Hydroprene is an imitation hormone for use on cockroaches. It is used on the young cockroaches (nymphs) which then grow into sterile adults. Since it doesn't kill adults directly, a conventional pesticide is used with it on the first treatment to kill off the current generation of fertile adults. So although it is claimed to be the most effective treatment discovered so far, it doesn't completely eliminate the problem of pesticides. Hydroprene has been used successfully in the USA for at least two years. At the time of writing it isn't approved yet for use in this country: a manufacturer submitted it for approval in mid-1988.

Borax

Traditional inorganic poison for ants and cockroaches. Relatively low toxicity by all routes. Powder is mixed with sugar as bait: it then looks like sugar so strict care must be taken to keep it away from foodstuffs and children and to clean up unused deposits.

NOTE

* Poisonous Substances in Agriculture Regulations 1984. Where a substance is specified under these regulations, it is illegal (among other things) to re-enter a greenhouse for 12 hours after its use. If it is dangerous in a greenhouse, it must be dangerous in any other indoor space, such as an office or a home.