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Control Measures for Some Common Household Pests

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Control Measures for Some Common Household Pests

Many kinds of insects are found in or about houses. Some do considerable damage to clothing and house furnishings, some attack woodwork and furniture, while others infest foodstuffs and may render them unfit for human consumption. It is the purpose of this bulletin to give useful information regarding household insects and the conditions under which they thrive, and to make recommendations for their control.

Care and cleanliness in house-keeping will do much to reduce insect development. Woollens, furs, and such articles of animal origin are subject to attack by clothes moths, especially if left unprotected during the summer months. The regular beating of carpets and rugs or cleaning with a vacuum cleaner does much to reduce insect pests. Cracks between floor boards and in cupboards harbour dirt and serve as a refuge for insects. Foodstuffs should, of course, be protected from the attention of flies and the attacks of cockroaches and from the various insects that infest cereal foods. Precaution should be taken to prevent the introduction of insects into houses in foodstuffs and on clothing, in furniture and other house furnishings, particularly second-hand goods.

Insecticides

Where household pests have become established there are numbers of ways in which they may be eliminated. These include the use of fumigants and other insecticides, and the treatment or elimination of breeding places. Reference will be made to certain fumigants and insecticides recommended in the control of various insects infesting dwellings. Among these are carbon bisulphide, carbon tetrachloride, naphthalene, sodium fluoride, pyrethrum, paradichlorobenzene, and calcium cyanide. The nature of these materials, their application, and the conditions under which they should be used are described in this bulletin. These substances can be readily obtained from chemical supply houses, and they form the active principle of most proprietary insecticides.

Carbon bisulphide: Cost about 1s 6d per lb, or, say, 1s a pint. It is a colourless liquid which, on exposure to air, vapourises into a foul-smelling, **highly inflammable, poisonous gas**, heavier than air. Used in sufficient concentration and at the right temperature it is very destructive to insect life and has excellent penetrating qualities. It is extremely useful for carrying out fumigation on a small scale, such as in

fumigating insect-infested materials in air-tight boxes or trunks. Owing to the highly inflammable nature of the gas and the fact that it forms an explosive mixture with air, it must be handled with care, and must not be exposed to any form of fire, sparks from electric switches, sparks formed by hammering upon metal, lighted cigarettes, etc.

Carbon bisulphide is most effective when used at temperatures of 70deg. F. and over, and therefore should only be used in very warm weather and never near a fire. The quantity to use varies from half to one pint of liquid to each 100 cubic feet of space, depending on the gas-tightness of the box. Receptacles may be made more gas-tight by pasting strips of paper over cracks and other openings. Since the gas is heavier than air and penetrates downwards, it is necessary to expose the liquid at the top of the space, or on top of the material to be fumigated, using shallow dishes for this purpose. The fumigation should be allowed to continue for some time (at least 24 hours).

Carbon Tetrachloride—Cost about 1s per pint. It is sometimes used in place of carbon bisulphide as a fumigant, chiefly owing to the fact that it vapourises into a gas which is non-inflammable and non-poisonous to human beings. It is, however, less effective than carbon bisulphide. It is used under the conditions described for carbon bisulphide. The gas is heavier than air. To secure good results it must be used at the rate of two pints of liquid to each 100 cubic feet of space, in reasonable air-tight rooms or trunks, at a temperature of not less than 70deg. F., for a period of 24 hours, and being non-inflammable can be used in a heated room.

Naphthalene—Cost about 6d per lb. It is commonly sold in the form of moth-balls, but is also obtainable in flake form. It is a safe material for use in preventing injury to clothing, carpets, etc. The fumes of naphthalene, when present in a sufficiently high concentration, are lethal to insects. As the fumes are given off very slowly, naphthalene is of value in protecting materials in tightly constructed boxes, trunks, and other receptacles, but loses its effect when exposed to air. It is necessary to use about a pound of naphthalene to an ordinary sized trunk, and to renew the material at least once a year, preferably early in spring.

Sodium Fluoride—Cost about 2s per lb. It is sold in the form of a fine white powder. It is an effective insecticide against cockroaches, silverfish and earwigs, and forms the basis

of many proprietary insect powders. It is applied by scattering or dusting it in places frequented by insects. Small particles of the powder adhere to the bodies of the insects, and in endeavouring to clean themselves they are poisoned by it. Sodium fluoride does not lose its effectiveness on exposure to air and so may be left in infested places until the insects have disappeared. In view of its somewhat poisonous nature, care should be exercised in its use, while children and domestic animals should not be allowed access to it.

Pyrethrum—Cost about 3s per lb. It is a yellowish powder made from the finely ground flower-heads of certain species of chrysanthemums. It has excellent insecticidal properties when fresh, and forms the basis of numerous proprietary insect powders and fly-sprays. Its effect is due to the presence of volatile oil, hence it is necessary to use fresh pyrethrum of good quality and to store it in tightly-sealed containers. Pyrethrum is harmless to human beings and domestic animals.

Pyrethrum-kerosene spray is a useful insect spray and is easily prepared by adding $\frac{1}{2}$ lb pyrethrum to 1 gal. of kerosene, allowing the mixture to stand and agitating it at intervals over a period of two hours. A residue settles at the bottom and the clear liquid may be poured off. For household use and to prevent staining fabrics or furniture, water-white kerosene should be used, and in order to impart a pleasant odour, methyl salicylate (oil of wintergreen) should be used by adding at the rate of three fluid ounces for each gallon of spray. The spray should be stored in tightly-corked containers. To destroy flies the spray is applied in the form of a fine mist, with a small hand sprayer, using about one fluid ounce to each 1000 cubic feet of space (a room about 10 x 12). Best results are obtained when doors and windows are closed. The dead and paralysed insects should be swept up and burned to prevent any from re-covering.

Paradichlorobenzene: Cost about 2s per lb. It is a white crystal-line powder which, at ordinary temperatures, slowly vapourises into a gas. The gas is non-inflammable and non-poisonous to human beings. It may be used in the same manner and in the same quantities as naphthalene.

Calcium cyanide (or commercially "Cyanogas"): Cost about 8d per lb. It is one of the most effective fumigants used in the control of insects and it may be employed without fear of injury to furniture, fabrics, or other household equipment. Calcium cya-

nide is sold in tightly sealed tins, in dust or granular form. It is applied by merely spreading it thinly on dry papers. It combines with the moisture in the air forming hydrocyanic acid gas (cyanogas), and leaves a residue of calcium hydroxide. To increase the activity of the material, a little water should be sprinkled about the building before the fumigant is distributed. When the gas given off is inhaled it is extremely poisonous to animals and **human beings**, and it should therefore be used only by intelligent and careful persons, fully alive to its dangerous properties. The antidote for hydrocyanic acid gas poisoning is the inhalation of ammonia fumes. Calcium cyanide should not be left where it is accessible to irresponsible persons or children. It is extremely dangerous to remain in any part of a building which is being fumigated. The amount of material to use depends on the airtightness of the building. For general purposes, 2lb of calcium cyanide to each 1000 cubic feet of space should prove satisfactory. When the fumigant has been scattered in a thin layer on papers the building must be vacated immediately and remain closed for 48 hours or more. After being thoroughly aired for two hours by opening all doors and windows from the outside, the building may be occupied and the residue of the powder rolled up in the papers and burned.

Houseflies

Houseflies pass through four life-stages, namely, egg, maggot, pupa, and winged adult. The female flies deposit their eggs in batches in fresh manure, human faeces, garbage, or other decomposing organic matter. The eggs may hatch within 24 hours into maggots which live close to the surface of the material in which they are developing. On reaching maturity in less than a week in warm weather, they go into a resting stage, usually along the edge of manure piles or in the surrounding soil. This pupal stage lasts about a week, depending on the temperature. In warm weather the period elapsing from the time the egg is laid until the emergence of the winged fly may be less than two weeks.

Control.—The most effective and desirable method consists in eliminating their breeding places as far as possible by properly treating or disposing of such material as manure or garbage. Fresh horse manure is a prolific source of housefly production. One neglected manure heap or garbage dump is often sufficient to infest a whole neighbourhood, and it is therefore necessary to enlist the active co-operation of the whole community.

Where practicable, manure should be removed daily and spread thinly where the drying effect of the sun and wind will prevent breeding. An alternative method is to take advantage of the heat produced by fermentation when manure is placed in tightly-packed piles. The manure pile should be placed on concrete to prevent the maggots having access to soil in which to pupate. The sides of the pile should be clean cut and almost vertical. As fresh manure is added to the pile it should be tightly packed. The heat produced will destroy all housefly eggs, maggots and pupae, except, perhaps, a few close to the surface of the top layer. The application by means of a watering can of a solution of borax made by dissolving 1lb of borax (cost approximately 3d per lb) in six gallons of water will

destroy those near the surface. Six gallons of solution is sufficient to treat 30 square feet of surface area. A 5 per cent. solution of cresol in water applied at the rate of one gallon to the square yard may also be used (cresol costs about 5s a gallon).

Organic refuse and all garbage should be stored in fly-proof garbage tins until finally disposed of by burning. The covering of garbage with soil or ashes does not prevent flies from breeding. Flies have been known to force their way to the surface from maggots and pupae buried to a depth of six feet in soil.

Measures should be taken to exclude all flies from dwellings and to prevent them from contaminating food. Doors and windows of houses should be screened, and any flies that gain entrance should be destroyed by spraying with pyrethrum-kerosene spray. The best means to achieve this where the fly nuisance is serious is to screen doors and windows. Maximum ventilation helps to drive flies out of doors.

Earwigs

The following poisoned bran mixture is recommended for the destruction of this pest:—Sodium fluoride, 12oz; molasses, 2 quarts; wheat bran, 12lb; water, six quarts.

Dissolve the molasses in water, add the sodium fluoride, then wet the bran with the poisoned mixture, stirring all the while. The mixture must not be made into a sloppy mass. It is spread in places frequented by earwigs during warm evenings. In gardens the mixture may be scattered among plants to be protected. When this bait is used it should be scattered thinly and not in lumps, and not left where children or domestic animals would have access to it. The use of traps, i.e., rolled up paper, pieces of bamboo, etc., placed about the ground collect the earwigs, which can then be destroyed by burning.

Clothes Moths

Articles of clothing and other materials subject to attack should not be left undisturbed for long periods, particularly during summer. Such articles, after being thoroughly brushed and beaten and hung in strong sunlight, should be placed in well-made trunks with tightly-fitting lids, or enclosed in cardboard boxes sealed with paper strips. One pound of fresh naphthalene flakes or a similar quantity of paradichlorobenzene, scattered among the garments in an ordinary sized trunk, assures perfect protection from moth injury. Valuable articles of clothing may be protected by placing in cold storage. Articles of clothing already infested with moths may be freed of the insects by placing them in a tight trunk and fumigating with carbon bisulphide or carbon tetrachloride. Moth damage to piano felting may be guarded against by placing 1lb of naphthalene flakes in suspended cheese cloth bags, inside the piano. When a house is closed up for a time, particularly in summer, it is wise to scatter naphthalene flakes liberally over rugs and carpets, afterwards rolling them tightly and tying them up in stout brown paper.

When upholstered furniture becomes infested with moths, it should be fumigated with carbon bisulphide or carbon tetrachloride.

Silverfish

These are wingless insects about half an inch long, possessing each a

pair of long feelers and three long tail-like appendages at the end of the body. They occur in dwellings, libraries, and bakehouses, where they may be found in warm, moist, secluded situations among papers, books, clothing, etc. Silverfish feed mostly on starchy materials and glue. They may prove troublesome by attacking starched clothes, bindings of books, or dry foodstuffs containing starch.

Like most household pests, silverfish thrive best in situations left undisturbed for relatively long periods. When discovered, the infested rooms ought to be thoroughly cleaned and then sprinkled with pyrethrum powder or sodium fluoride in places where they are likely to be numerous. When pyrethrum is used, it requires to be renewed at intervals.

Booklice

These are small greyish-white active insects slightly larger than a pin head, louse-like in appearance but quite unlike true lice in habits. They frequently occur in old books which have been left undisturbed for some time. They feed on a variety of organic substances, but rarely do serious damage. They may occur in large numbers in poorly-lighted, warm rooms, and may occasionally be found breeding in straw mattresses and furniture stuffing of vegetable origin.

Thorough cleaning and airing of infested rooms should give satisfactory results. When present in large numbers, efforts should be made to find the source of infestation which should be removed. Spraying with pyrethrum-kerosene spray will destroy them. Mattresses and upholstered furniture may be cleaned of booklice by means of fumigation.

"The Borer" (Wood-boring Beetles)

The usual beetles found attacking wooden buildings and furniture are the "white pine borer" and "powder post beetles." To prevent attack on furniture by these beetles, the most effective substance to use, where its smell and dark colour is not objectionable, is creosote applied to the outside of the timber, preferably about October.

Other effective dressings for use against attack by wood-boring beetles are:—(1) Turpentine, 9 parts; kerosene, 1 part; paradichlorobenzene, 1 part. This dressing stains light coloured wood slightly. (2) Maxwell Lefroy's mixture: Paradichlorobenzene, 50 parts; kerosene, 47 parts; barium oleate, 3 parts. Cracks and bore holes should be filled after the treatment of wood to eliminate signs of attack and to protect against reinfestation. The following substance may be used according to the nature of the surface:—(a) On polished surfaces—Resin 1 part, beeswax 3 parts. (b) On unpolished surfaces use a liquid filler—1 part beeswax, 3 parts paraffin wax (140deg.-145deg. Fahrenheit), 8 parts turpentine (to which 10 per cent. kerosene has been added).

Infested articles of small furniture can be fumigated, inside an air-tight box, with carbon bisulphide or carbon tetrachloride.

Copies of this Bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.