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IOWA AGRICULTURAL EXPERIMENT STATION

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ENTOMOLOGY SECTION

Cockroach Destruction in Buildings

By B. B. FULTON

To have a building overrun with cockroaches is both undesirable and unnecessary. In the household, cockroaches chew leather and book bindings, soil and impart a disagreeable odor to food materials, and they are potential carriers of disease. In restaurants and hotels roaches are apt to discourage patronage. Infested grocery stores may act as distributors of the insects, and the housewife will not take kindly to finding a roach among the edibles delivered to her kitchen.

Under most conditions cockroaches can be entirely eliminated or at least reduced to negligible numbers by any one of the methods described in this circular.

Sodium Fluoride

The easiest and cheapest treatment against cockroaches is the application of sodium fluoride as a dust to their runways and living quarters. The first essential to success in this method is to locate the breeding and congregating places of these pests, which are usually narrow cracks just wide enough to admit their bodies. They come out for feeding just after dark, and a little careful scouting about the building at that time with a flashlight will usually reveal their breeding quarters and customary paths of travel to food supplies. The sodium fluoride, in the form of a very fine dust, should be blown from some form of hand dust gun into all cracks that are apt to be harboring roaches. A little dust should also be sifted on all places where they run about in search of food. This treatment will be effective only in dry places where the material can remain as a dry dust. The roaches get it on their feet and when cleaning them get it into their mouths. Its action is slow, so to secure satisfactory results it must be left in place for several weeks or until no more roaches can be found.

Sodium fluoride is poisonous to human beings but not extremely so. If only a light coating of dust is applied to exposed places there is no danger from its use. It would require the consumption of several grams to cause the death of an adult person.

Fumigation

In damp basements the use of sodium fluoride may not prove very successful. If it fails to control the cockroaches the more costly method of fumigation with hydrogen cyanide gas may be used. This gas may be generated by the old method of using sodium cyanide and sulphuric acid, but fumigation with calcium cyanide as described here is much simpler for house fumigation since it requires no acid. Cyanide fumigation has the advantage of quick results but is dangerous to human life if carelessly handled and necessitates vacating the building for 12 to 24 hours.

The cubic contents of each room to be fumigated must be computed. From 2½ to 3 pounds of calcium cyanide for each 1000 cubic feet will give good results if the building is of fairly tight construction. The granular form is probably the most desirable for this purpose. Best results will be obtained by fumigating in the summer, during a period of humid weather.

The building must have two or three windows and doors on each floor arranged so they can be opened from the outside to permit ventilation after fumigation and before one enters. This may be accomplished for the windows of upper floors by suspending a rope or wire from a screw eye placed in the under side of the upper sash. If the windows are left unlocked they can be opened by pulling down on the rope. Cracks around outside doors and windows should be calked with rags or paper. Exposed food products and house plants should be removed during fumigation and should be examined carefully for live roaches or eggs before being returned. The floor space upon which to spread the cyanide should be covered with several thicknesses of old newspaper. The proper amount of cyanide for each room should be weighed out-of-doors, put in small airtight containers and then placed in its respective room. When everything is ready, spread the cyanide in a thin layer as quickly as possible while holding the breath. If there are several rooms to fumigate on each floor it would be best to have a man in each room to apply the poison simultaneously so that all can leave at once. The ground floor should be treated last, so that it will not be necessary to pass thru any room after the cyanide is in place. *Remember the extremely poisonous nature of the gas and never take a full breath in a room after the calcium cyanide has been scattered. The building should be locked to prevent entrance of anyone not aware of the poison.* Since roaches generally travel into all parts of a building, it is better to fumigate the whole building rather than a part.

Sulfur Fumigation

Houses may also be fumigated by burning sulfur, and this method is usually effective for cockroaches if at least 2 pounds

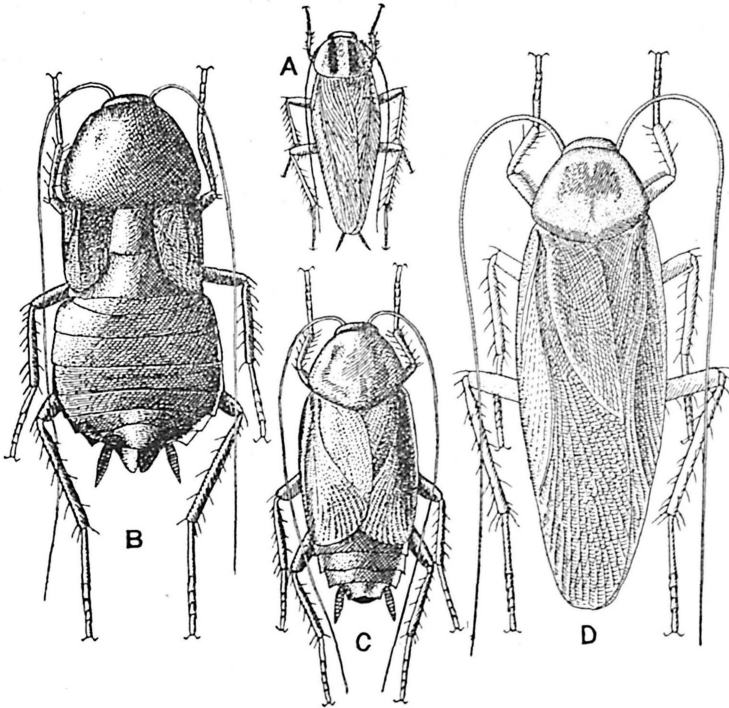


Fig. 1. . A. German Cockroach. B. Oriental Cockroach, female. C. Oriental Cockroach, male. D. American Cockroach.

per 1000 cubic feet are used and the fumes are confined for 24 hours. Sulfur fumes are not so poisonous to man as cyanide, but this method is objectionable because it bleaches colors and tarnishes metals and its use is attended with some fire risk. It can be recommended only for buildings where these factors are of minor importance. Colored fabrics, house plants and metal objects can be removed during fumigation, and metal fixtures may be coated with vaseline. The sulfur should be placed in a pan and moistened with alcohol to facilitate ignition. The pan should be placed on bricks in the middle of a tub containing water.

Common Species of Cockroaches

Several species of roaches inhabit buildings, the most common being the German cockroach¹, or Croton bug, which can be recognized by its small size, pale brown color and the presence of two dark stripes on its thorax. The next most common roach in

1. *Blattella germanica* (Linnaeus).

buildings is the Oriental cockroach² which is very dark brown or black with wings shorter than the body, the wings of the female being reduced to mere flaps. The American roach³ is a large long winged species having reddish brown wings and paler thorax with a diffused dark central blotch. The Australian roach⁴ is similar to the American but has a more sharply defined dark spot on the thorax and has yellowish borders along the outer edge of the wings for a third of its length. The Smoky Brown roach⁵ is also similar to the last two but is entirely dark uniform brown in color.

Life History

The eggs of cockroaches are deposited in horny brown capsules which contain a large number of eggs. The egg capsule of the German roach is shaped somewhat like an elongated bean but is more rectangular. The capsules of the other house roaches are shaped like a purse. The young roaches are flat like the adults but lack the wings. The females of the Oriental roach are the only adult forms of house roaches that lack wings, and even these can be distinguished from the immature by the more elongated form of the pads which represent the wings.

The young roaches shed their skins five times in the course of their development. Roaches breed continuously in heated houses, so all stages of growth may be found at any time. The German roach develops most rapidly. It is said to have two or three generations per year, while the American roach requires about a year for a single generation.

2. *Blatta orientalis* (Linnaeus).
3. *Periplaneta americana* (Linnaeus).
4. *Periplaneta australasiae* (Fabricius)
5. *Periplaneta fuliginosa* (Serville).