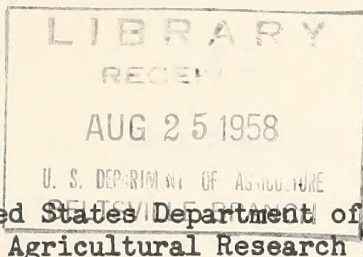


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SUGGESTIONS FOR FLY CONTROL IN POULTRY ESTABLISHMENTS

Prepared by the Insects Affecting Man and Animals Research Branch,
Entomology Research Division

Flies have always been a problem in poultry establishments. In recent years this problem has been increased by the use of batteries of cages with wire floors. Poultry droppings fall through the wire, and if they are allowed to accumulate for several weeks the thick layers and cones formed may provide favorable breeding material for house flies and other species. Surface water from any source, such as a defective watering system or driving rain, will make most of the manure mass suitable for fly breeding. The breeding is generally greater on concrete or other impervious floors than on bare ground, because there is no loss of moisture by seepage. It is very difficult to control flies in such places, and thousands may be produced daily.

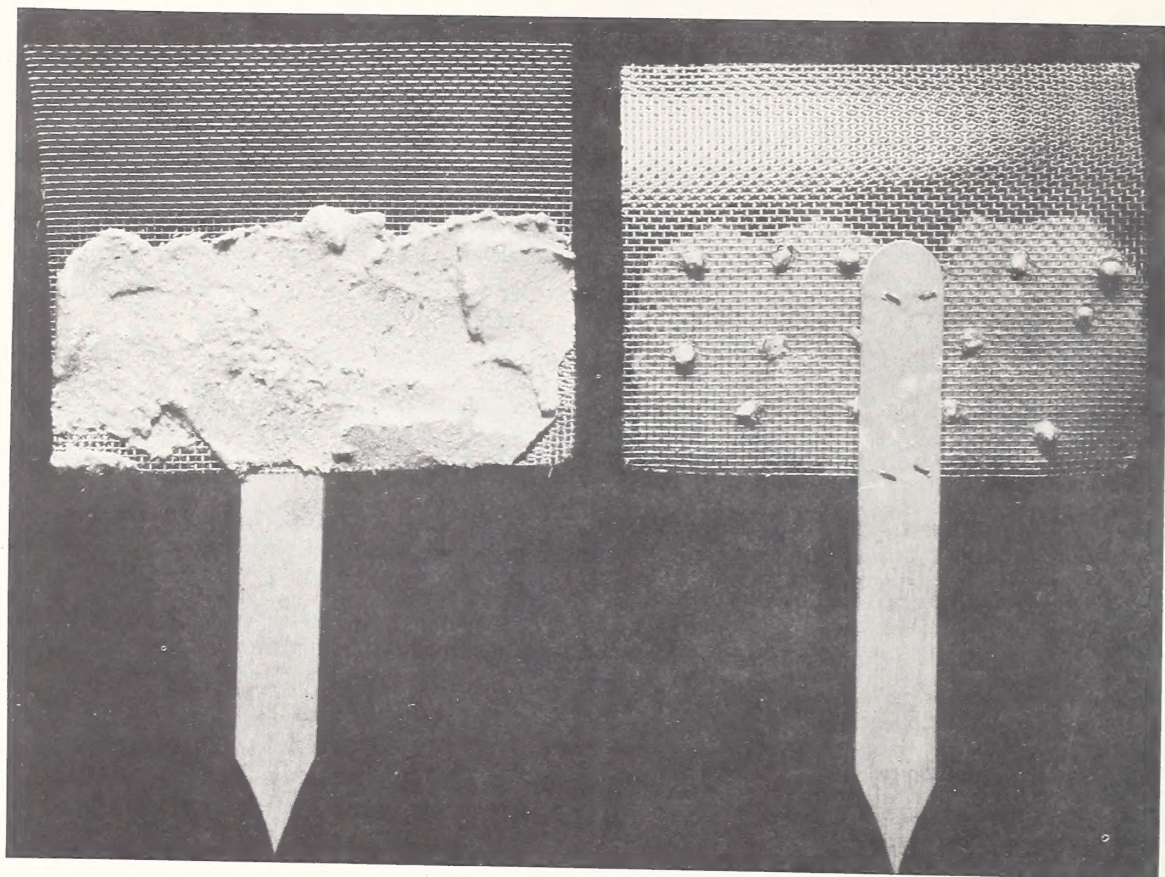
Good sanitation is the first step in controlling flies around poultry establishments, just as it is around livestock barns and certain processing plants. Manure should not be allowed to accumulate, but should be disposed of at least twice each week. If this procedure is not practicable, an insecticide must be used. Several materials are effective and they may be applied in different ways. Choose the method that is most suitable for your establishment. Insecticides and methods of preparing and applying them are given in the accompanying table. Some of these insecticides can be purchased ready mixed, but most of them are available as wettable powders or emulsifiable concentrates.

Dry and Liquid Baits

Poison baits will control adult house flies in certain types of poultry houses and other livestock shelters. Dry baits should be scattered on a fairly dry, hard surface, so as not to dissolve and become ineffective. They may be applied on floors, window sills, in feed rooms, and in other places where flies rest or search for food.

Liquid baits may be applied with an ordinary sprinkling can on floors, boards, sacks, or similar surfaces. About half the holes should be plugged so that the bait will spread thinly in strips 4 to 6 inches wide.

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Bait stations. Station at left shows side of screen to which bait was applied; that at right the other side with projections through the screen that help anchor the bait.

Bait Stations

A special use of poison baits in fly control is in bait stations, where the bait is applied to small pieces of screening.

Although the fly reduction is not so rapid as with dry scatter baits, in some situations the stations offer a means of baiting once to get control that will last for a month or more. In an establishment where 50 to 100 stations were used, the flies were reduced 90 to 99 percent for as long as 3 months. Since the stations provide their own treated surfaces, it is not necessary to apply insecticides directly to any part of the poultry shed. Their use thus avoids the staining of walls sometimes caused by surface applications, particularly of formulations containing sugar.

Bait stations are not commercially available, but they may be prepared from plastic-impregnated screening commonly used on poultry farms. A piece of screening 4 inches square in which several holes $\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter have been punched is stapled to a wooden tongue depressor so that about half the depressor projects beyond the screen. The screen is slightly bent to shield one surface from rain and droppings. This surface is then coated with the toxic bait. When the bait has dried, the portion that has flowed through the holes serves to anchor it to the screen. (See photograph on opposite page.)

The dry baits described in the table may be used on the screens, but a special bait prepared according to the following formula is more effective:

5 lb. of granulated sugar
5 lb. of clean, dry sand
 $\frac{3}{4}$ lb. of 25% malathion wettable powder, or
 $\frac{3}{8}$ lb. of 25% Diazinon wettable powder
Two 3-ounce packages of household gelatin
(sold in food stores for desserts)
2 to $2\frac{1}{2}$ cups of hot water

Thoroughly mix the sugar, sand, and wettable powder in a dry pail. Dissolve the gelatin in $2\frac{1}{2}$ cups of boiling water in a separate container, and gradually add 2 cups to the dry ingredients. Use a trowel or paddle for mixing; do not expose your bare hands to insecticides. The bait should be the consistency of a thick paste. If too wet it will not adhere to the screen and if too dry it may crumble. It may be necessary to add some of the other half-cup of dissolved gelatin. Apply the thick paste to the screen with a paddle or old knife, and allow it to dry overnight.

This amount of bait paste will be sufficient for about 150 stations. The cost is approximately \$5, including the plastic-impregnated screen, which costs about \$2. The quantities of ingredients should be proportionately reduced if fewer bait stations are desired. Cheaper screen may be used if the stations are not exposed to rain.

FLY CONTROL IN POULTRY ESTABLISHMENTS

Treatment	Insecticide and Diluted Strength	Preparation*	Application
DRY BAITS	Diazinon 1% Malathion 2%	Purchase a prepared bait or make one by mixing 1½ tbsp. Diazinon WP or 3 tbsp. malathion WP with 1 lb. granulated sugar.	Use daily or every other day at 1 oz./1,000 sq. ft. or 150 ft. of aisle and droppings. Use larger quantities if flies are still numerous after first application.
	Dipterex 1%	Purchase a prepared bait.	5 lb. is maximum for homemade baits; larger amounts do not mix well. Thorough mixing is essential
LIQUID BAITS	Diazinon Dow ET-57 Malathion (all 0.1%)	¾ pt. sugar or molasses. 2 tbsp. WP (any of 3 named), or 1 tbsp. Diazinon or ET-57 EC or 1/2 tbsp. malathion EC. 1 gal. water.	Use 1 gal./1,000 sq. ft. See page 1.
BAIT STATIONS	Diazinon Malathion Dipterex (all 2% for best results)	See instructions on page 3.	Use at least one station for every 10 feet, more where flies are numerous.
SURFACE SPRAYS	Diazinon Dow ET-57 Malathion (all 1%)	1 lb. WP (any of 3 named), or 1½ pt. Diazinon EC or ET-57 EC or 12 fl. oz. malathion EC. 5 gal. water.	Spray supports, overhangs, and weeds at 1-2 gal./1,000 sq. ft. Repeat in 7-14 days.
	Chlordane 2-2.5% DDT 2-5% Lindane 0.3-0.5% Methoxychlor 2.5-5% Toxaphene 5%	Follow directions on label.	Effectiveness very limited; most house flies are resistant to these insecticides.
SPACE SPRAYS	Allethrin Pyrethrum	Follow label directions.	Use daily. Safe even in feed and egg rooms.

LARVICIDES Water-base	Diazinon 0.1% Dow ET-57, 0.1%	2½ fl. oz. EC to 5 gal or 2 oz. WP to 4 gal. water.	Use 2½ gal./100 sq. ft.
	Malathion 0.5%	4 fl. oz. EC to 5 gal. or 10 oz. WP to 4 gal. water.	
Oil-base	Diazinon Dow ET-57 Malathion (all 3 to 4%)	1 to 1 1/3 pt. EC to 1 gal. fuel oil for Diazinon and ET-57 or to 2 gal. for malathion.	Use 1 gal. with Diazinon or ET-57 or 2 gal. with malathion per 1,000 sq. ft. Do not apply Diazinon or ET-57 on manure to be used as fertilizer for food crops other than orchard fruits. Exclude poultry and other animals from treated areas.
DUST	Diazinon 1.25%	2 lb. WP, 36 lb. fuller's earth, and 2 lb. Celite.	Use 3 lb./100 sq. ft. Helps dehydrate manure.
IMPREGNATED CORDS	Diazinon Parathion	Purchase commercial strings.	Hang vertically or with 2 ft. sag in loops, using 30 ft./100 sq. ft. of building. Effective 6 wk. or longer.

*Diazinon, Dow ET-57 (Korlan), and malathion are all available as 25% wettable powders (WP), but the content of the emulsifiable concentrates (EC) varies, thus: 25% Diazinon, 24.4% Dow ET-57, and 50-57% malathion. Quantities given apply to WP or EC.

CAUTION.--When using any insecticide, follow all precautions on the label.
Especially avoid contaminating poultry or eggs with any insecticide not labeled for direct use on poultry.

The tongue depressors may be sharpened on the free end and pushed into the ground at the edge of manure piles, or hung from the cages to a position as near the ground as possible. They may also be tacked to cage supports below and out of reach of the poultry. At least one bait station per 10 feet should be used, and more in places where the flies are congregating. (See photograph on opposite page.)

Cloth strips, 2 or 3 inches wide and about 30 inches long, treated with the bait paste may also be used as bait stations. These strips, tacked in place, may be useful in localities where flies gather high in a building rather than on and near the floor. They may be made of a cheap grade of cotton or burlap.

Surface and Space Sprays

Insecticides may also be used as sprays, either applied to the surface or discharged into the air within the building. In a small poultry house a hand sprayer is satisfactory, but in a large one a power sprayer may be preferable. For applying a space spray a fogger or an aerosol bomb is also suitable. A fogger utilizes the material most economically.

Surface sprays leave residues that are effective against adult flies for several weeks. Space sprays do not leave satisfactory residues, but will kill flies with which they come in contact. They are most effective in buildings that can be closed tightly.

All the insecticides listed may be useful in some localities, but house flies are becoming resistant to DDT, chlordane, methoxychlor, lindane, and toxaphene. Space sprays containing pyrethrum plus piperonyl butoxide, propyl isome, or sesame oil are effective against all flies, and some of them also contain small percentages of DDT, methoxychlor, lindane, or malathion. Diazinon, Dow ET-57 (Korlan), chlordane, and toxaphene are not recommended as space sprays.

Larvicides

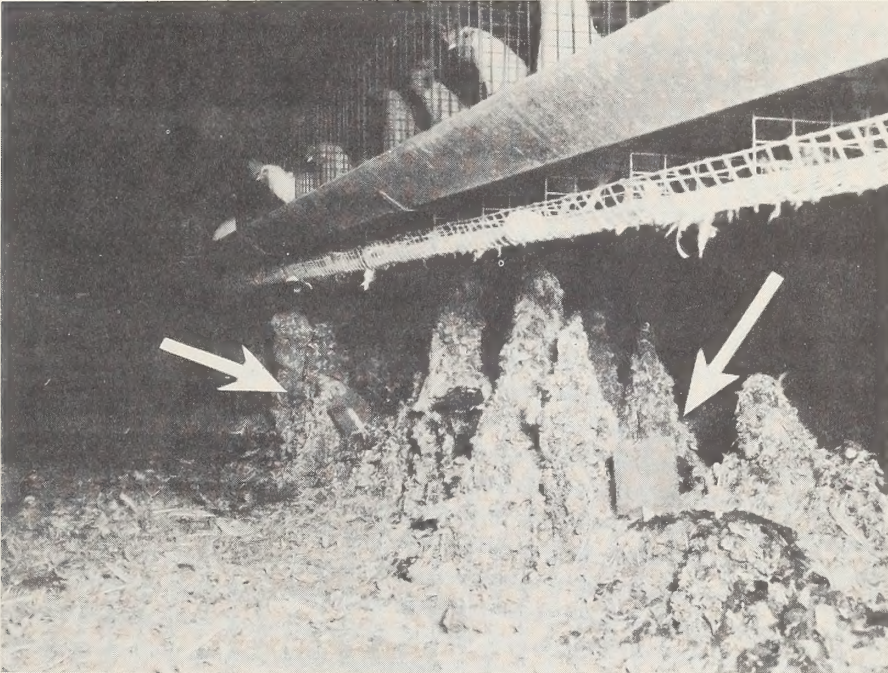
House fly larvae in poultry manure can also be destroyed with sprays. Applications are usually made with hand sprayers and must be repeated every week or two. Water-base sprays have been found to liquefy the manure in many humid localities. Oil-base sprays do not cause liquefaction and are equally effective.

Impregnated Cords

In many places cords impregnated with insecticides have been found effective when hung vertically or in loops from the ceiling of the poultry building. Flies resting on these cords are killed because of the residual effect of the insecticide. Residual control lasts 4 to 6 weeks, sometimes longer. In some States these cords may be used only by pest-control operators.

Miscellaneous Methods

Fly paper, electric grids, jar traps, and similar devices are sometimes useful. They are most effective in well-screened establishments.



Bait stations in use among cones of manure in a poultry house.

