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SUGGESTIONS FOR FLY CONTROL IN POULTRY ESTABLISHMENTS

Prepared by the Insects Affecting Man
and Animals Research Branch

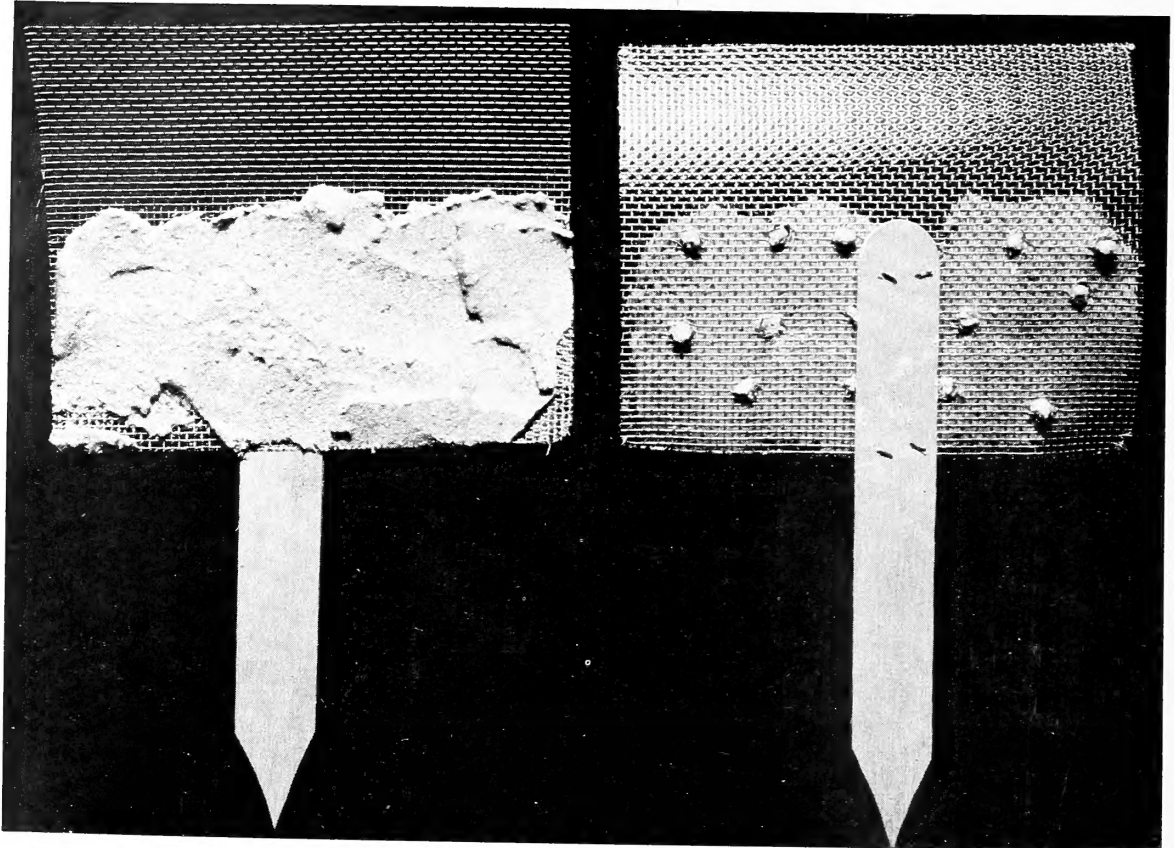
Flies have always been a problem in poultry establishments. In recent years this problem has been increased by the use of batteries of cages with wire floors, which have provided favorable places for the house fly and other flies to breed. When poultry droppings are allowed to accumulate for several weeks, the thick layers and cones formed may provide favorable breeding material, especially if they are moist. A defective watering system, driving rain, or surface water 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. In such places thousands of flies may be produced daily, and it is very difficult to control them.

Good sanitation is the first step in controlling flies around poultry establishments, just as it is around livestock barns, certain industrial processing plants, and homes. Manure should not be allowed to accumulate, but should be removed and disposed of at least twice each week. This procedure is not always entirely practical; so an insecticide must be used. Insecticides and formulations to use are given in the accompanying table.

Dry and Liquid Baits

Poison baits have been very successful in controlling 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 the floor, 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. About half the holes should be plugged so that the bait will spread thinly in strips 4 to 6 inches wide. They may be applied on dry floors, boards, sacks, or other impervious materials.



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 baits in fly control is in bait stations, where the bait is applied to small pieces of screen to give a supply that will last for several months without additional treatment.

Although the fly reduction obtained with bait stations cannot be expected to be so rapid as with dry scatter baits, experiments indicate that in some situations the stations offer a means of baiting once to get control that will last for a month or more. In a poultry establishment where 50 to 100 stations were used, the flies were reduced 90 to 99 percent for as long as 3 months. The stations furnish their own treated surfaces, and where they prove effective it is not necessary to apply insecticides directly to any part of the poultry shed. Thus they avoid the staining of walls sometimes caused by residual 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 4- by 4-inch piece of screen, with several holes $1/8$ to $1/4$ inch in diameter, is stapled to a wooden tongue depressor, with about half the depressor projecting beyond the screen. The screen is slightly bent to shield one surface from rain and droppings. The inner 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.)

Dry baits formulated as described in the table may be used at these stations, but they are not so effective as a special bait prepared according to the following formula:

5 lb. of granulated sugar
5 lb. of clean, dry sand
 $3/4$ lb. of 25% malathion wettable powder, or
 $3/8$ 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 dry ingredients (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.

FLY CONTROL IN POULTRY ESTABLISHMENTS

Treatment	Insecticide and Concentration	Formulation	Remarks
DRY BAITS	Diazinon 1%	Purchase a prepared bait or make one at home by mixing 1½ tbsp. 25% WP with 1 lb. granulated sugar.	Use daily or every other day at 1 oz. per 1,000 sq. ft. or 150 ft. of aisle and droppings. Use larger quantities if flies are still numerous after first application.
	Malathion 2%	Purchase a prepared bait or make one at home by mixing 3 tbsp. 25% WP with 1 lb. granulated sugar.	5 lb. is maximum mix for home-made baits; larger amounts do not mix well. Thorough mixing is essential.
	Dipterex 1%	Purchase a prepared bait.	
LIQUID BAITS	Diazinon 0.1% Malathion 0.1%	Mix ¾ pt. sugar or molasses and 2 tbsp. 25% WP, or 1 tbsp. 25% Diazinon or ½ tbsp 57% malathion EC with 1 gal. water.	Apply 1 gal. per 1,000 sq. ft., using a sprinkling can with half the holes plugged. Bait forms a 4-6-inch swath of rivulets. Ineffective on absorbent surfaces.
BAIT STATIONS	Diazinon Malathion Dipterex (2% for best results)	Prepare according to instructions on page 3.	Place a station every 10 ft. in ground or near floor below cages, but to one side of manure piles.
SURFACE SPRAYS	Diazinon 1% Malathion 1%	1 lb. 25% WP, 1½ pt. 25% Diazinon EC, or 12 fl. oz. 57% malathion EC per 5 gal. water.	Spray supports, overhangs, and weeds at 1 to 2 gal. per 1,000 sq. ft. Repeat in 7-14 days.
	DDT 2 to 5% Chlordane 2 to 2.5% Methoxychlor 2.5 to 5% Lindane 0.3 to 0.5% Toxaphene 5%	Use according to label directions.	Effectiveness very limited; most house flies are resistant to these insecticides.
SPACE SPRAYS	Allethrin Pyrethrum	Follow label directions.	Use daily. Flies must be contacted. Little residual effect. Best in closed areas. Can be used in feed and egg rooms.

LARVICIDES Water-base	Diazinon 0.1%	Mix 2½ fl. oz. 25% EC per 5 gal. or 2 oz. 25% WP per 4 gal. water.	Use 2.5 gal. per 100 sq. ft. In humid localities the manure may liquefy; if so, use an oil-base larvicide or dust.
	Malathion 0.5%	Mix 4 fl. oz. 57% EC with 3 gal. or 10 oz. 25% WP with 4 gal. water.	
Oil-base	Diazinon 3 to 4%	Mix 1 to 1 1/3 pt. 25% EC per gal. fuel oil or kerosene.	Use 1 gal. per 1,000 sq. ft. Do not apply Diazinon on manure to be used as fertilizer for food crops other than orchard fruits. Exclude poultry and other animals from treated areas.
	Malathion 3 to 4 %	Mix 1 to 1 1/3 pt. 57% EC per 2 gal. fuel oil.	Use 2 gal. per 1,000 sq. ft. Neither Diazinon nor malathion spray will liquefy manure.
	Diazinon 1.25%	Mix 2 lb. 25% WP with 36 lb. fuller's earth and 2 lb. celite.	Use 3 lb. per 100 sq. ft. Helps dehydrate manure.
FLY CORDS	Diazinon Malathion Parathion	Purchase commercial strings.	Hang vertically or with 2-ft. sag in loops, using 30 ft. per 100 sq. ft. of building. Gives residual control for 4-6 wk. Use of parathion cords may require a permit from State Commissioner of Agriculture.

WP = Wettable powder. EC = Emulsifiable concentrate.

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.

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

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 point 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. As far as is known, they are not commercially available but may be made of a cheap grade of cotton or burlap.

Surface and Space Sprays

Surface sprays leave a residue that may be effective for several weeks. DDT, methoxychlor, chlordane, toxaphene, lindane, malathion, and Diazinon are recommended for such use in poultry houses. Apply the spray at the rate of 1 or 2 gallons to 1,000 square feet. Wet the surface without causing runoff. Use a power, compressed-air, or knapsack sprayer, depending on the size of the building.

Space sprays do not leave a satisfactory residue, but when discharged into the air will destroy flies present in the building. A hand or power sprayer or fogger or an aerosol bomb may be used. A fogger uses the material most economically. Pyrethrum sprays containing piperonyl butoxide, propyl isome, or sesame oil are effective against all flies. Some of these sprays also contain DDT, methoxychlor, or lindane. Space sprays are most effective in poultry houses that can be closed rather tightly.

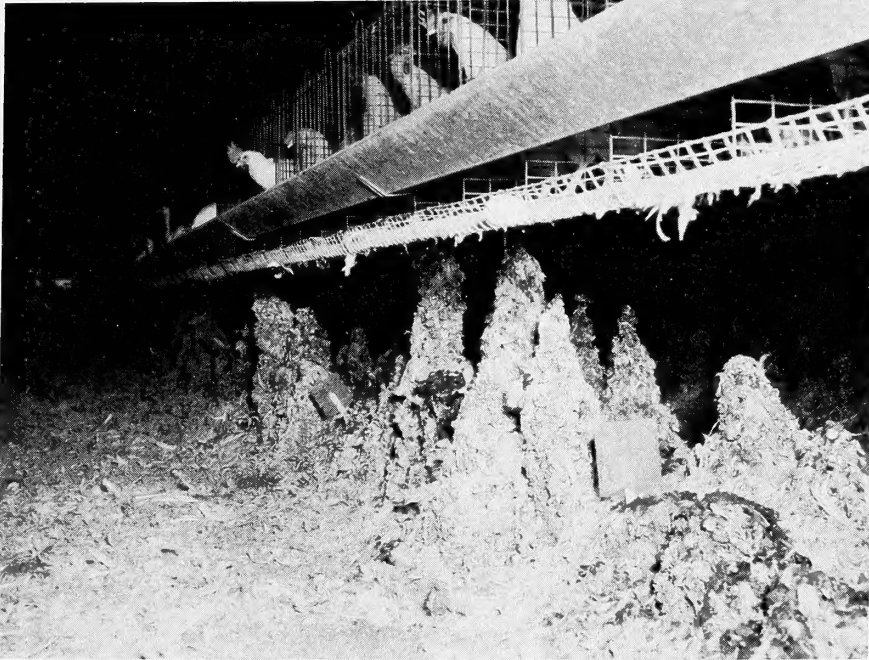
In some localities house flies are resistant to DDT, chlordane, methoxychlor, lindane, and toxaphene.

Fly 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 from 4 to 6 weeks.

Larvicides

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



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

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