West Virginia University
Extension Service

IPM: Integrated Pest Management

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House Fly Biology and Management

House flies are well-known cosmopolitan pests of both farm and homestead. Not only are they a nuisance, but they can transport disease-causing microorganisms. Thus, large populations of flies are a potential threat to the health of animal and man.

Identification

The adult house fly, ***Musca domestica***, is 1/4-inch long and light gray, with four dark lengthwise stripes on the thorax, pale yellow sides on the abdomen, and reddish eyes. House fly maggots are 3/8-inch long, creamy white, and spindle-shaped.

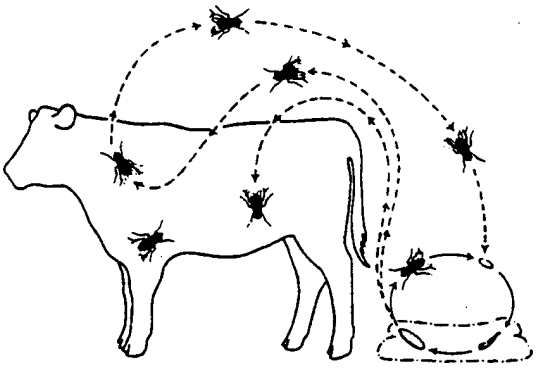
Biology, Habits, and Life Cycle

The house fly is a nonbiting fly belonging to a group of flies known as filth flies. This name comes from the female flies' habit of laying their eggs in various types of moist, decaying organic materials. House flies prefer to breed in either manure or garbage. Each female fly lays up to 500 eggs in several batches of about 150 each over a three to four day period. House fly maggots feed on and develop in the material where the eggs are laid. When the maggots are full grown, they crawl to a drier region of the breeding material and transform to the pupal stage.

The house fly overwinters in either the larval or pupal stage under manure piles or in other protected locations. The life cycle from egg to adult requires as little as seven to 10 days. House flies are active in the northeast from May through October with the largest populations occurring during July, August, and September.

Economic Threshold

House flies are monitored with baited traps, sticky ribbons, or spot cards. Spot cards are 3-inch by 5-inch white index cards attached to fly resting surfaces. Cards have some advantages over the other monitoring methods in that they are nontoxic, inexpensive, and can be filed away for a permanent record of fly activity. A minimum of five cards should be placed in each animal facility and left in place for seven days. A count of 100 or more fecal or vomit spots per card per week indicates a high level of fly activity and a need for control.



The lifecycle of the house fly is about 10-14 days long

Management Strategies

Integrated pest management for house flies combines cultural manure management methods with the use of traps and biological control agents.

Cultural Control. House fly management begins with removing the maggots' food source. Management of livestock waste is therefore the first step in a pest management program. Since the house fly can complete its life cycle in as little as seven days, removal of wet manure at least twice a week is necessary to break the breeding cycle. The manure can

be spread to dry or added to a liquid manure pit. If a pit is used, care should be taken not to allow any manure to accumulate above the water line as this provides ideal conditions for fly development.

Wet straw should not be allowed to pile up in or near buildings. Since straw is one of the best fly breeding materials, it is not recommended as bedding. Coarse sawdust or shredded paper make suitable bedding materials and do not harbor flies. Spilled feed should not be allowed to accumulate but should be cleaned up every two to three days.

Mechanical Control. Traps for adult flies can be useful in house fly control programs if enough traps are used, if they are placed correctly, and if they are used both indoors and outdoors. House flies are attracted to white surfaces and to baits that give off odors. Thus, cone- or pyramid-shaped traps covered with white freezer paper and coated with sticky adhesive are usually effective. Such traps can be baited with a mixture of molasses, water, grain, and milk. An alternative bait—developed at the Beltsville, Maryland Agricultural Research Center and known as the Beltsville Bait—is more convenient to mix and store (see recipe below).

Outdoors, one trap should be installed for every 20 to 30 feet of perimeter of fly breeding area. Recommended placement areas include near building entrances, in alleyways, beneath trees, and around animal sleeping areas and manure piles. Indoors, ultraviolet light traps collect the flies inside an inverted cone or kill them with an electrocuting grid. One trap should be installed for every 30 feet of wall inside buildings.

Biological Control. The use of biological control agents in fly management programs is still at a relatively early stage. At present, parasitic wasps are the most widely used biological control agents for house flies. A highly recommended parasitic wasp for livestock operations in the northeast is the species ***Muscidafurax raptor.*** Other species commonly sold through farm magazines have proven ineffective in some cases.

In addition to the parasites that occur naturally in a manure ecosystem, populations can be supplemented by periodic releases of wasps purchased from a commercial insectary. House fly populations develop twice as fast as parasite populations. Therefore, without supplemental parasite releases there is a lag time of several weeks between numbers of flies and numbers of parasites.

An early-season augmentative parasite release program can greatly increase the population of parasites. Such a release program should begin in mid- to late May and continue through August. Research indicates that weekly releases of 200 parasites per cow can provide effective control. Using this number, the average cost per cow for the parasites is 26 cents per week or between $2.60 and $4.70 for an entire season. The cost of the parasites normally is more than offset by savings in traditional insecticides. Since each farm is different, however, the actual number of parasites used may require adjustment to be both effective and affordable.

Parasitic wasps should not be used as the sole method of control. Their use should be combined with a program of manure management and trapping. If it becomes necessary to include the use of insecticides into a management program, only products that are not harmful to the parasites, such as baits and pyrethrin space sprays, should be used.

Beltsville Bait [1]

1 pound granulated sugar
1 pound baking powder (double-acting type)
2 ounces dry bakers' yeast
6 ounces air-dried blood or freeze-dried fish meal
1/4 cup honey
2 tablespoons water (actual amount required may vary with humidity of the air)

Mix the ingredients thoroughly. Press the mixture into a plastic ice-cube tray to form cubes. Invert the tray to dump the cubes, then let them dry to form hard blocks. To use the bait, add 2 bait cubes to 2 quarts of water. Place the bait in a wide-mouth pan beneath a cone- or pyramid-shaped trap.

[1] Pickens, L. G., E. T. Schmidtmann and R. W. Miller. 1994. How to control house and stable flies without using pesticides. USDA Agricultural Information Bulletin Number 673.

Reference: Foreyt, William J. 1994. Veterinary Parasitology Reference Manual. 3rd edition.