



# EntGuide



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## Stable Fly (Dog Fly) Biology and Control in Florida

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### GENERAL

The stable fly (sometimes referred to as the dog fly in northwest Florida) is a blood-sucking fly that can be a nuisance to man, pets and livestock. This fly becomes a pest of humans only when its primary animal hosts are absent.

### THE PROBLEM

Frequently, the coastal part of New Jersey, shores of Lake Superior and several Tennessee Valley Authority lakes and more importantly, the beaches of northwest Florida have serious problems with adult stable flies attacking man. Blood-seeking stable flies congregate on Florida Panhandle beaches (from Escambia to Taylor County) during August through November as a result of northerly winds associated with high pressure areas and cold fronts. Scientists at the John A. Mulrennan, Sr. Arthropod Research Laboratory (JAMSARL) have documented adult stable flies moving to the beaches from southern Alabama, Mississippi, Georgia and northern Florida farming areas. Often during early afternoon, thermal currents on land pull winds from the Gulf causing flies that congregate on these beaches to become bothersome inland as far as 10-15 miles.

### BIOLOGY

Stable fly adults look like house flies in size and color (Fig. 1A) except that stable flies have a long piercing mouthpart used for penetrating the skin to obtain blood, whereas, house flies do not (Figs. 1B and 1C). Both sexes of this fly usually feed twice daily on blood. The life cycle of the stable fly is shown

in Figure 2. The female lays about 500-600 small (about 1/16 inch), whitish, sausage-shaped eggs in her lifetime. Eggs hatch 2-5 days into larvae (also known as maggots) which feed and mature in 14-26 days. Stable fly maggots look similar to house fly maggots and develop in

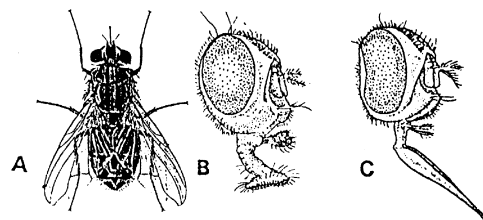


Figure 1. A.) Adult stable fly, mouthparts of: B.) house fly C.) stable fly.

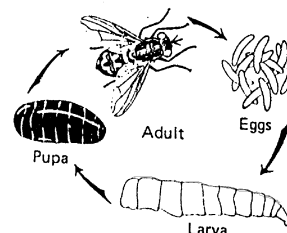


Figure 2. Life stages of the stable fly.

decaying silage, hay or straw mixed with manure, green chop (top portions of young forage used for food), spilled feed along feed troughs, as well as eroded walls of trench silos where silage is stockpiled on animal facilities. Under ideal conditions, more than 3,000

maggots/sq. ft. have been found on W. Florida dairy farms in mid-January and 5 times that in summer.

Mature maggots (about 3/8 inch long) will move to drier areas in order to pupate. The puparium is a bright red to chestnut brown colored barrel-looking structure (about 1/4 inch long) from which the adults will eventually emerge in 6-26 days.

Adult flies live for about 2-3 weeks in warmer weather and longer during cooler weather. The average life span from egg to adult is 28 days (ranging from 22-58 days) depending on weather conditions. Adult stable flies can be carried by winds up to 150 miles from their developmental sites and can be produced continuously throughout the year in Florida.

Stable flies feed mainly on the legs and bellies of cattle and horses. They will also feed on the tips of dogs ears where the hair is not quite as dense (hence the common name "dog fly"). After they have taken a blood meal, stable flies will leave the animal and rest on nearby buildings, fences or vegetation to digest their meal. Cattle will stamp nervously, switch their tails and become irritable during episodes of stable fly feeding. Some animals have been known to stand in water up to their nose to escape these flies during heavy infestations. Stable flies are inactive at night, resting on fences, sides of buildings, in tall grasses or weeds, as well as, trees and shrubs.

## **CONTROL**

### *Nonchemical*

The most practical and economical method for controlling adult stable flies is elimination or proper management of maggot production sources. Any decaying organic matter should be considered a potential source for stable flies. It is important to remember that fly maggots cannot develop in dry materials. Stockpiled vegetation or manure should be turned weekly or spread thinly so that it dries out. This includes any stockpiled rotting vegetables from gardens, grass clippings from compost piles or animal manure. If this method cannot be used, cover the pile with black polyethylene plastic and let it compost. Cover the pile completely so that flies cannot lay eggs underneath the plastic in the compost.

Chickens that run loose on animal facilities (especially horse farms) can contribute to reducing the amount of stable fly maggots in manure. As these birds pick through animal droppings they spread out the manure which eventually dries preventing additional fly development to occur. This method appears to work only on small piles of droppings and not stockpiled manure.

### *Parasites*

Stable flies have natural insect enemies, such as parasitic wasps, which are found in and around fly developmental areas. Wasp parasites have been available, commercially, for a number of years to aid in reducing filth flies around animal facilities. Parasitic wasps are very small (about 3/32" in length) and control stable flies by laying their eggs in the fly's puparium. When the wasp egg hatches into a larva, it eats the fly pupa thereby killing the developing stable fly. During this time, the immature wasp will continue to devour the contents of its host pupa (the stable fly) and eventually emerge as an adult wasp.

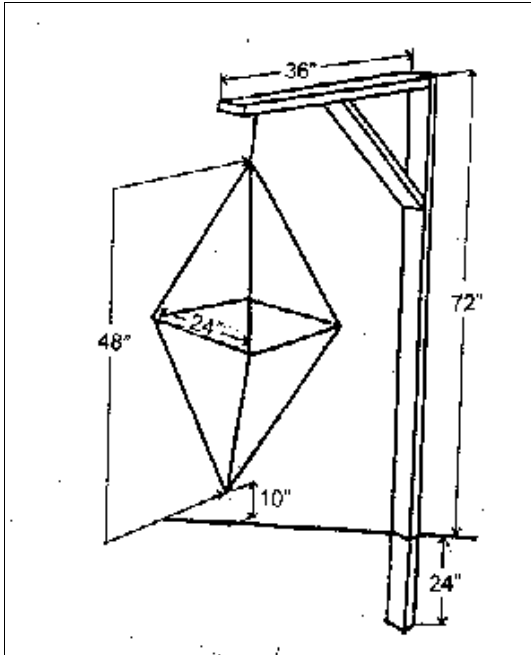
Sometimes the level of adult stable fly control can vary tremendously when using parasitic wasps. A number of variables must be considered if parasites are used. Suitability or adaptability of parasite species to locale, purity and age of mass-reared parasite stock that is used, adequate placement of parasites, number and frequency of releases plus weather, all affect the results obtained. Although parasitic wasps may aid in controlling stable flies, they are not fast-acting nor 100 percent effective. As a result, these insects should not be relied upon as a sole source for control. Sanitation, through manure management, is essential when using parasites. Usually adult stable fly production quickly overwhelms what control the wasps may have exerted when manure management is not practiced. Unfortunately, little is known about what parasites are effective, plus how many are needed for control, when used against stable flies on animal facilities in Florida. Funding sources for such research initiatives are currently needed.

### *Sticky Traps*

Non-insecticidal reduction of adult stable flies, in livestock facilities, using adhesive-coated sheets or tapes have been used with some success. These products are usually hung indoors from ceilings or over alleyways of barns. Sticky ribbons or fly papers are sold in a variety of sizes at livestock supply, hardware and discount stores.

A "pyramid" sticky trap fashioned out of white-painted triangular plywood panels fastened together in the shape of a diamond and covered with adhesive or adhesive-coated cellophane sheets has been reported by U.S. Department of Agriculture scientists to reduce stable flies around barns. The pyramid trap is suspended from a scaffold so that it is about 2 feet above the ground. Stable flies are attracted to the vertical underside surface of the trap. Other flies, such as house flies can be trapped on the upper surfaces (Fig. 3). A sticky trap being

evaluated for stable fly control on animal facilities, by Mulrennan Research Laboratory scientists, consists of an 8 inch diameter x 12 inch clear fiberglass (Alsynite®) cylinder covered with an adhesive-coated cellophane sleeve. The cylinder is oriented vertically and



**Figure 3. Illustration of pyramid trap.**

one side is fitted onto a slotted wooden stake about 2 feet above the ground. The trap is then placed in or near barn entrances. Depending on the size of the barn, at least two traps should be used. This trap will also collect house flies. Care should be taken to place traps in areas where they will not be trampled by animals.

#### *Chemical Control*

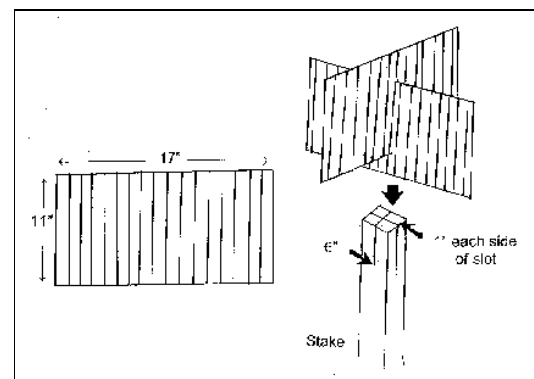
Application of insecticides to kill maggots in decaying organic matter is not recommended. This is because: 1) earthworms or other beneficial organisms present may be killed, 2) organic matter tends to bind up some insecticides and render them ineffective against the target pest, and 3) stable fly maggots tend to be found at ground level at the vegetation interface; a large volume of insecticide would have to be applied to get the material to this level making it economically unfeasible for large livestock production areas. Therefore, widespread use of insecticides in maggot developmental areas is generally avoided.

Several general outdoor aerosol insecticides to control flying insects are available over-the-counter and may offer temporary relief against adult stable flies when used per label instructions. The amount of area

treated, persistence of the aerosol cloud and rate of influx of new flies into the area, after treatment, will affect duration and degree of control.

Insecticides applied as residual sprays may be applied to sides of buildings where adult stable flies congregate. **Water soluble (EC) formulations** of pyrethroids, such as permethrin, are useful in this situation and afford quick knockdown of adult flies as well as provide some residual action to kill other flies that contact the treated surfaces. Before using residual sprays one should apply the material to a small area to make sure that staining does not occur. Control can be variable depending on type of substrate treated. Residual sprays should be used on an as-needed basis because continual applications may contribute to fly resistance.

Another method of reducing adult stable flies is by using white Orlon® yarn treated with an emulsifiable formulation of the insecticide permethrin (e.g. Atroban®, Ectiban®, or PermethrinII®) and wrapped around clear 12 x 18 inch fiberglass panels. Yarn is treated by placing it in a 1% permethrin solution (approx. 1 tablespoon per gallon of water) and heated to 150°F (do not boil) for 20-30 min. After the yarn has dried, string the treated yarn on the fiberglass panels leaving a 1 inch space between each string (use protective gloves when handling treated yarn). After two panels have been strung, each panel is slotted to interlock in a criss-cross pattern and placed in a notched stake approximately 2 feet above ground (Fig. 4).



**Figure 4. Fiberglass trap showing yarn arrangement.**

Stable flies are attracted to the fiberglass panel and the vertical surface of the yarn. Those flies that land on the insecticide-impregnated yarn pick up enough insecticide to kill them and fly off before dying. There will be no traces of dead flies under the traps. Do not place traps where they will be trampled by animals. The level of stable fly control and longevity of the insecticide

in the yarn is currently being evaluated. **Always follow label instructions when using insecticides.**

Several insecticide formulations for biting fly control on pets and livestock are available commercially. A listing of products for on-animal treatment and application to areas around livestock facilities are listed in the references section of this EntGuide. Most insecticides applied to the hair coat of dogs for flea and tick control will usually kill stable flies. Dogs that are outdoors sometimes have their ears bloodied by attacking stable flies. Products such as, Fly-Off Ointment<sup>®</sup> or Swat<sup>®</sup> (Farnam Companies, Phoenix, AZ) may help reduce this problem. These are directly applied as an ointment to the dog's ears. The insecticide kills flies upon contact and the ointment aids in healing the broken skin of the ear. **Contact your veterinarian if you have any questions regarding safety when applying insecticides to animals.**

#### **THE STATE OF FLORIDA DOG FLY CONTROL PROGRAM**

Because of the tremendous effect on tourism when stable flies accumulate on Florida panhandle beaches, the State has funded a special Dog Fly Control Program since 1972. This program is currently administrated through the Department of Agriculture and Consumer Services and consists of an aerial spray program which controls stable flies along the beaches. A DC-3 aircraft dispenses the insecticide naled

(Dibrom<sup>®</sup>) from an altitude of about 150 feet. Dead flies can usually be found on the ground about 5-10 minutes after the spray cloud moves across the beach. The aerial spray program is only initiated when landing rates of 5 or more flies per minute are recorded by trained surveillance personnel. Such personnel are usually provided by local mosquito control districts. For more information about the Dog Fly Control Program, contact Joe Ruff, Director, (904) 872-4250.

#### **PERSONAL PROTECTION**

Stable fly bites can be painful to man as well as animals. These flies are persistent feeders, when hungry. Stable flies tend to bite man around the ankles. Commercial repellents containing 25-40% DEET (diethyl metatoluamide), sold at most hardware and grocery stores under trade names such as, Ultra Muskol<sup>®</sup>, Cutter<sup>®</sup> (stick or creme), Deep Woods Off! <sup>®</sup>, Sun & Bug Stuff<sup>®</sup> and Ultrathon<sup>®</sup> have been reported by Consumer Reports to have kept stable flies off the arms of human volunteers for at least 2.5 hours.

Although the bite of a stable fly may hurt, little irritation exists after the bite and few people exhibit severe allergic reactions. To lessen itching associated with stable fly bites, a topical anesthetic such as benzocaine or lidocaine may be applied to the area. These materials are available over-the-counter by a variety of trade names at most stores.

#### **References for More Information**

1. Consumer Reports. 1993. Bug off! How to repel biting insects. Consumer Reports July, pp. 451-454.
2. Pickens, L G., E. T. Schmidtman and R. W. Miller. 1994. How to control house and stable flies without using pesticides. USDA, Agricultural Research Service, Agricultural Information Bulletin 673.
3. UF Coop Ext. Serv. Control recommendations for pests around animal facilities. Fact Sheet ENY-255.
4. UF Coop Ext. Serv. External parasite control recommendations for horses, mules and ponies. Fact Sheet ENY-252. For dairy cattle see Fact Sheet ENY-251.

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