Stable Fly Biology and Management

The stable fly is the most common biting fly pest of confined livestock. Its irritating bites can cause considerable distress to animals and result in reduced production.

Identification
The stable fly, Stomoxys calcitrans, is 1/4-inch long with a pale spot behind the head, indistinct stripes on the thorax, and seven dark spots on the abdomen. The stable fly is similar in size and appearance to both the house fly and the face fly. Two important differences are the stable fly’s biting habit and its biting mouthparts that stick out like a bayonet from the front of the head. An easy field identification tip is the stable fly’s behavior of biting cattle (or people) on the lower legs. Since they inflict a very painful bite, stamping of the feet is a sign that stable flies are present and feeding.

Biology, Habits, and Life Cycle
Stable flies have piercing-sucking mouthparts used to puncture the skin and obtain blood. The flies perch with their heads pointed downward while feeding. Both male and female stable flies feed on blood. Each fly feeds several times per day, taking only a drop or two of blood at a time. Adult flies are common near barns, animal pens, and shade trees. They often bite while cattle are in the shade around a building or under a tree.

Female stable flies lay their eggs inside barns in such decaying organic matter as wet straw or manure-straw mixtures. Stable fly larvae also develop in other wet, decaying plant material such as spilled feed, silage, and grass clippings. Development from egg to adult requires about 3 weeks during warm weather and up to 9 weeks when temperatures are cooler. Stable flies overwinter as larvae or pupae in piles of larval breeding material.

Although the stable fly has historically been a pest only of cattle housed in barns, it is becoming a pasture pest in operations where large hay bales are used. In such situations, larval development takes place in decaying hay at the base of improperly stored bales.

Economic Threshold
Stable flies are monitored by counting the flies on all four legs of about 15 animals. When the average number exceeds the treatment threshold of 10 flies per animal, control measure should be implemented. Stable fly feeding can cause a decline in production due to the animals’ fatigue from trying to dislodge the flies. Heavy infestations of more than 50 flies per animal can reduce weight gain by 25 percent and milk production by 40 to 60 percent.

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

Cultural Control. Management of livestock waste is the first step in pest management. Since the stable fly can complete its life cycle in as little as 21 days,
removal of wet manure at least weekly 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, be certain not to allow manure to accumulate above the water line, since this provides ideal conditions for fly development.

Wet straw should never be allowed to pile up in or near buildings. Moreover, since straw is one of the best fly breeding materials, it is not recommended as bedding. Coarse sawdust or shredded paper make excellent bedding materials and do not breed flies. Likewise, spilled feed should not be allowed to accumulate but should be cleaned up every 2 to 3 days.

**Mechanical Control.** Traps for adult flies can be useful in stable fly control programs if enough traps are used, they are placed correctly, and they are used both indoors and outdoors. Outdoors, stable flies are attracted to vertical white panels not more than 30 inches above the ground. Once attracted to the trap by a carbon dioxide producing bait, the flies can be trapped with sticky adhesive or killed with an electrocuting grid. 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. Indoor fly traps of the ultraviolet light type kill flies with an electrocuting grid or trap them inside an inverted cone. One trap should be used for every 30 feet of wall.

**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 stable flies. A highly recommended parasitic wasp for livestock operations in the northeast is the species *Muscida furax 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 augmented by periodic releases of wasps purchased from a commercial insectary. Because stable fly populations develop twice as fast as parasite populations, without supplemental 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.

A parasite release program should begin in mid- to late May and continue through August. Research suggests 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 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.

**Reference:**