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SUPPRESSION OF STABLE FLIES ON CATTLE

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The stable fly may be the most significant livestock pest in America. Its painful bite and blood-feeding behavior causes stress and may lead to self-injury while trying to escape an attack. More than 20 flies per animal can adversely affect animal health and significantly lower income for livestock producers. Evidence shows that heavy infestations of stable flies on beef cattle reduce weight gain by 25 percent and, in dairy cattle, decrease milk production by 10 to 20 percent.

Figure 1. Adult stable fly.

To suppress stable flies effectively and economically, it is important to:

- Identify them properly,
- Understand their life cycle, and
- Use a combination of control strategies.

IDENTIFICATION

The stable fly, *Stomoxys calcitrans* (Fig. 1), looks like the house fly but is smaller, measuring about 5 to 7 millimeters. Stable fly mouthparts protrude bayonet-like from the front of the head, unlike the house fly with its non-protruding, sponge-like mouthparts.

The stable fly abdomen differs from the house fly by having seven circular spots in a checkerboard pattern. The house fly abdomen has no pattern.

Because stable flies primarily bite the legs of livestock, they may first be noticed when livestock stomp and kick their legs excessively. Stomping also makes dairy cows difficult to milk. When stable flies are present, unrestrained animals will bunch up in self-defense, which can cause an increase in heat stress.

BIOLOGY AND HABITAT

The stable fly has a complete life cycle with egg, larval (maggot), pupal, and adult stages (Fig. 2). Populations can increase quickly. Under optimal conditions, the egg to adult cycle is about 3 to 4 weeks; therefore, several generations can develop each year. A female stable fly lives for 3 to 4 weeks and lays 500 to 600 eggs during her lifetime.

Figure 2. Stable fly maggots and pupa. *(Courtesy of Bart Drees, Texas AgriLife Extension Service)*

The eggs are typically laid in wet straw, wet hay bales (Fig. 3), or in other decomposing vegetation mixed with the urine and feces produced by the animals.

Figure 3. Remnants of hay bales can become breeding sites for stable flies. *(Courtesy of Jeff Tomberlin, Texas A&M University)*

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MANAGEMENT

To suppress stable fly populations efficiently, producers should use an integrated pest management (IPM) approach. IPM relies on three tactics for successful suppression of an insect pest: cultural, biological, and chemical.

Cultural control: Cultural control methods involve manipulating the environment to reduce insect pest populations. The most economical and effective method for suppressing stable fly populations is sanitation.

In confined animal facilities, a top priority should be to eliminate stable fly breeding sites as often as possible. To do this, remove and spread decomposing vegetation or bedding material that has become mixed with urine and feces. Spreading the bedding will allow the material to dry faster and prevent colonization by the stable fly.

Another tactic for confined animal areas is to design the stalls to allow for complete manure removal and drainage. Cleaning out the wet feed remaining in the ends of troughs should be done weekly, as the wet feed serves as a breeding site for flies.

For small to moderate populations of adult flies, sticky traps and other mechanical methods, combined with sanitation, are effective in confined areas. However, sticky traps will not substantially reduce fly numbers alone. Sticky traps should be changed weekly as they become coated with dust or "saturated" with flies.

Spreading decomposing vegetation, such as unused hay, should also be implemented for range or pasture cattle. When hay bales are provided as supplemental feed for cattle, sites where hay bales have been placed can become ideal stable fly breeding areas (Fig. 3). Hay rings can help to reduce stable fly populations in the field or pasture by reducing the amount of wasted hay trampled into the soil. Regularly moving cattle feeding sites reduces accumulations of wasted hay and helps eliminate breeding sites.

Sticky Traps: The use of sticky traps provides a non-chemical approach to controlling both male and female stable flies. Sticky traps are attractive to adult flies as resting locations during bloodmeal digestion. These traps are best placed out of reach of animals. Currently, there are three traps on the market designed to work against stable flies: the Knight Stick Biting Fly Trap from BugJammer, Inc., Starbar Bite Free Stable Fly Trap, and Olson's Biting Fly Trap.

Biological control: This IPM tactic uses natural predators, such as fire ants, parasitoids like the wasp *Spalangia sp.,* or pathogens, such as *Bacillus thuringiensis,* to suppress pests.

The parasitic wasp, *Spalangia sp.,* is available commercially. The wasp lays an egg into the pupa of the stable fly. The immature wasp feeds on the pupa, eventually killing it. The wasp then emerges as an adult and begins the cycle again.

At this point, there is no clear answer to the effectiveness of using parasites to reduce stable fly populations. Chances for success are greatest when coupled with waste and water management and chemical control as needed. Chemical controls should be limited to sprays or other application techniques that will not come in contact with breeding sites which could kill the parasitoids. Wasp releases must be conducted on a set schedule and are needed each year; do not count on establishing a population on your farm. Wasps may supplement an integrated program based on sanitation but are unlikely to provide adequate control by themselves when numerous breeding sites are available.

Chemical control: If a stable fly problem persists, an insecticide can be used. Many compounds are available for suppressing adult and larval stable fly populations. Always read the pesticide label in its entirety before making any applications.

Animals can be treated as needed with sprays containing permethrin (Catron, GardStar, Permectrin II, Permethrin, and Tengard), Ravap® EC (23% tetrachlorvinphos), and Vapona® EC (40.2% dichlorvos). Residual wall sprays such as Atroban® 11% EC (permethrin), Demon®WP (cypermethrin), Ravap®, and Vapona® can be applied to surfaces where the insects rest. These products can be used in backpack or truck sprayers for range or pasture cattle or used in misters daily on dairy cattle for protection against stable fly feeding. **Brahman and Brahman cross cattle should not be treated due to hypersensitivity to organophosphates.** One day withdrawal is required for beef cattle sprayed with Vapona®.

Many premise products are available (Annihilator®, Atroban® 11% EC, Brute®, Demon® Max, Durashield®, Elector® PSP, GardStar®, Grenade®, Permectrin II, permethrin, Ravap® EC, Rabon® 50 WP, Tengard®, and Vapona®) that can be sprayed around a livestock facility and on sidewalls that are used as resting sites for fed stable flies. Always follow product labels for conducting premise spray applications.

FOR MORE INFORMATION

Additional information on insecticides labeled for livestock arthropod pests can be viewed at: http://livestockvetento.tamu.edu.

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