

Suppression of Stable Flies on Cattle

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The most significant livestock pest in the United States is the stable fly (Fig.1). Its painful bite and blood-feeding stresses cattle and causes them to injure themselves trying to escape attack. The harm to animal health is especially noticeable when fly populations reach more than 20 per animal, and can significantly lower income for livestock producers. Research shows that heavy infestations of stable flies on beef cattle have reduced weight gain by 25 percent and, in dairy cattle, have decreased milk production by 10 to 20 percent.

To effectively and economically suppress stable flies:

- Identify them properly.
- Understand the insect's life cycle.
- Use a combination of control strategies.

Identification

The stable fly, *Stomoxys calcitrans* (Fig. 2),



Figure 1. Adult stable fly.

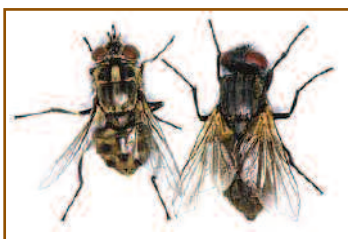


Figure 2. Comparison of the stable fly to the house fly. (Photo courtesy of David Boxler, University of Nebraska West Central Research and Extension Center.)

looks like the house fly and horn fly, but it is considerably larger ($\frac{1}{4}$ inch). Unlike these flies, stable fly mouthparts resemble a bayonet that protrudes from its head. It differs from the house fly in that it depends on blood as food and its bite is extremely painful. And, while the stable fly also resembles the deer fly and horse fly, it primarily attacks the legs of livestock.

When attacked by stable flies, animals will stomp and kick their legs, making dairy cows difficult to milk. Unrestrained animals will typically bunch together when attacked, increasing heat stress.

Biology and habitat

The stable fly life cycle includes egg, larval (maggot), pupal, and adult stages (Fig. 3). Populations can increase quickly. Under optimal conditions, the egg-to-adult cycle is about 3 to 4 weeks and several generations can develop each year.

An adult female stable fly lives for 3 to 4 weeks and lays 500 to 600 eggs during its lifetime.

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Figure 3. Stable fly maggots and pupa. (Photo courtesy of Bart Drees, Texas AgriLife Extension Service.)

The eggs are typically laid in wet straw, wet hay bales (Fig. 4), or other decomposing vegetation mixed with the urine and feces that the animals produce.

Management

To efficiently suppress stable fly populations, use an integrated pest management (IPM) approach of cultural, biological, and chemical tactics.

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

In confined animal facilities:

- Eliminate stable fly breeding sites.
- Remove and spread decomposing vegetation or bedding material that has become mixed with urine and feces to allow the material to dry faster and prevent colonization by stable flies.
- Design the stalls to allow for complete manure removal and drainage.
- Clean out the wet feed that remains in the ends of troughs weekly.
- For small to moderate adult fly populations, install sticky ribbons and other mechanical traps when combined with sanitation. However, sticky ribbons used alone will not substantially reduce fly numbers. Change



Figure 4. Remnants of hay bales can become breeding sites for stable flies.

them and other mechanical traps every 1 to 2 weeks because the ribbons dry out, become coated with dust, or become “saturated” with flies.

- At range or pasture cattle-feeding sites, spread decomposing vegetation such as hay bales that provide supplemental feed during the winter. These become ideal stable fly breeding areas the following spring (Fig. 4). Feeding hay in hay feeders reduces wasted hay trampled into the soil, and periodically moving the feeding site reduces the accumulation of wasted hay, helps eliminate breeding sites, and allows the location to dry out.

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

The parasitic wasp, available commercially, lays an egg into the stable fly pupa. Then the immature wasp feeds on the pupa, eventually killing it. The wasp develops into an adult and emerges from the pupa to start the cycle again.

Research has not determined whether parasites can effectively reduce fly populations. Wasps may supplement an integrated program based on sanitation, but are unlikely to adequately control many breeding sites. They are more likely to be successful if used with waste and water management and chemical control. If you use

both biological and chemical controls, apply with limited sprays or other application techniques that will not come in contact with breeding sites and kill the parasites. Do not count on establishing a population on your farm: Wasps must be released each year. For more information, see <http://www.ca.uky.edu/entomology/entfacts/ef502.asp>.

Chemical control: If a stable fly problem persists, many compounds are available for suppressing adult and larval populations. These compounds include sprays, backrubs, pole-rubs, misters, and premise products.

Treat animals as needed with ready-to-use sprays containing pyrethrins. Apply residual wall sprays such as Demon (400g/kg cypermethrin), Atroban 42.5 percent EC (permethrin), or Elector (2.46 percent spinosad) to surfaces where the insects rest.

For beef and dairy cattle, use spray products such as Disvap III (0.2 percent dichlorvos, 0.02 percent permethrin, 0.1 percent piperonyl-butoxide, 0.3 percent dipropyl-isocinchomeronate) or Vapona Concentrate (40.2 percent dichlorvos). Use these products in backpacks or truck sprayers for range or pasture cattle, or daily in misters on dairy cattle. Beef cattle sprayed with Vapona require one-day

withdrawal. Because of a hypersensitivity to organophosphates, do not treat Brahman and Brahman-cross cattle.

Backrubs, which use Atroban 11 percent EC (permethrin), can help reduce stable fly populations. However, because these rubs apply insecticide only to the animal's back, they do not treat some areas, such as the animal's legs. Because stable flies typically feed on the legs, backrub devices offer little protection in high populations. A pole-rub might be more effective.

Many premise products can be sprayed around a livestock facility and on side walls where stable flies rest. These products include Vapona, Annihilator, Atroban, Grenade, permethrin, Brute, GardStar, Elector PSP, StandGuard, Durashield, and Tengard. Take care to not spray animals with products labeled for premise-use only.

For more information

Additional information on insecticides labeled for livestock arthropod pests is available at <http://livestockvetento.tamu.edu>.

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Revision