

# Managing Stable Fly Production at Pasture Feeding Sites

Blood-feeding stable flies (*Stomoxys calcitrans*), also called biting house flies, are pests of livestock in confined animal feeding operations (AFOs). Confined feeding sites provide an abundance of diverse larval habitats including manure older than 10 days and spilled feed. These are among the most important larval breeding substrates. Previous efforts focused on reducing economic losses by controlling stable flies in confined operations. As a general rule, control measures are warranted if 150 stable flies per day are caught on sticky cylinder traps in AFOs. While stable flies have not been major pests of pastured cattle, they do affect animal performance.



Stable fly: Bloodsucking mouthparts extend from underneath the head.

Stable flies have become a pest to cattle and horses on pastures in the Midwest. Kansas State University researchers found as many as 800 flies per day in traps located within pastures in Riley, Pottawatomie and Reno counties. Pastured cattle react similar to confined cattle when bitten by stable flies. Stable flies mainly feed on animals' legs. To avoid being bitten animals stomp their feet and switch their tails. Other natural instincts include standing in water, lying with legs tucked underneath and bunching at the corners of pastures. Defensive responses to horn flies are different. Animals may throw their heads back and switch their tails. Horn flies behave in groups, lifting and landing as clouds on the host.

The effect of stable flies on weight gain performance of pastured cattle is similar to that of livestock in confined operations. Researchers in Nebraska recorded a reduction in average daily gain of 0.5 lb per head per day in 84-day trials compared to cattle that had insecticide application at least three times per week. Five stable flies per leg is considered the economic threshold, which can easily be exceeded under current pasture conditions.

## Stable Fly Production

Recent K-State research has identified winter feeding sites of hay in round bales as a main breeding ground for stable flies in pastures. These sites accumulate manure and wasted-feed, primarily hay, during the winter months. By spring, they are ideal breeding grounds for stable flies. The use of round-bale feeders is a common practice among livestock producers and urban livestock owners.

Data show from 2 to 60 percent of the bale fed in hay rings is wasted because of cattle feeding habits. Residue accumulates quickly in these areas because of increased animal activity around the feeding sites. Frequent cleaning or moving of the feeding site reduces the residue build-up. This creates a less than ideal habitat for stable flies to breed. Ideal stable fly breeding habitats include moisture, mild temperatures, and an abundance of larval substrate (wasted hay and manure).

Field sampling has shown the number of stable flies emerging from core samples of residues at feeding sites in Kansas was highly variable. Up to 364 stable flies emerged per square foot at some feeding sites. The common denominator at these sites was surface areas covered by accumulated manure and wasted hay residues. While an 8-foot bale ring may only occupy 50 square feet of space, the residue area of manure and waste hay may equal to 50 feet beyond the edge of the bale ring with a total affected area of nearly 2,800 square feet. This can result in more than 1 million stable flies being produced at a single feeding site.

## Stable Fly Control Methods

Currently, there are no effective methods to control stable flies attacking pastured livestock. Insecticide spraying on the legs of cattle results in only temporary (few days) relief. The insecticide residue is removed as cattle walk through vegetation wet with early morning dew. Dust bags, oilers, pour-ons, and ear tags are only partially effective because they fail to treat the belly and legs of cattle. Feed additives are ineffective because stable flies breed only in old manure where larvicide levels are degraded.

## Managing Feeding Sites

Cultural control (i.e., sanitation) is the most important method for on-site reduction of stable fly populations in livestock operations. Stable flies do not develop in pens where cattle continuously tread upon the manure because most common larval sites are old manure under fences, poorly drained areas and other areas avoided by the cattle. For AFOs, cleaning pens seasonally and scraping under fences, in addition to spreading manure, can be effective control measures.

For temporary feeding sites or urban livestock owners, preventing stable fly production involves eliminating the breeding habitat.

First, producers should prevent large accumulations of residue and moisture at the feeding site. Although research data is lacking on the effectiveness of different management practices at reducing residue and moisture accumulation in order to limit stable fly production, practical recommendations may include the following:



*Feeding sites can be a breeding ground for stable flies in pastures.*

- Continual physical movement of feeder location between feedings.
- Rolling hay out in different locations throughout the pasture.
- Avoid rolling out poor quality or rotted hay that will not be eaten.
- Grinding hay helps prevent sorting by the animal, which decreases waste.
- Avoid overfeeding regardless of feeding method to prevent trampling of hay, which becomes habitat once mixed with manure.
- Feeding locations should have adequate drainage to keep moisture from accumulating around the feeder. However, runoff from these sites should not enter open surface water, which could jeopardize water quality.

Secondly, if residue levels cannot be minimized, proper cleanup and removal of residue is necessary. Because the majority of fly production occurs in May and early June, the site must be cleaned and waste disposed of before April 15.

Management options for producers to clean sites include:

**Pile and compost the residue.** Composting generates heat, which might kill the larvae and some of the bacteria. This may be a practical alternative to complete removal of material. The pile must be turned after a couple weeks of initial composting to incorporate the outside material. Otherwise, the stable flies may breed on the outside of the material even though the internal portion of the pile is heating. Adequate residue is necessary to prevent seepage or liquid discharges from piles that may provide suitable breeding areas for the stable flies.

**Burning the residue.** Because the majority of the residue can be from wasted hay, producers may be able to dispose of the material by burning. However, moisture content of the residue may limit the effectiveness of this option in certain years.

Certain limitations based on costs associated with labor, type of feeding practice, equipment available for site clean up and the actual feeding site location will influence what management practices can be used to minimize stable fly production. Producers need to be aware of the impact that feeding sites have on production of stable flies, which in turn affect the performance of livestock in pastures and grasslands.

## Summary

Stable flies have been identified as major pest of animals grazing in pastures. Weight losses due to stable flies may be as high as 0.5 lb per head per day based on studies in Nebraska. The most practical control strategies are to frequently remove and destroy the residue around hay feeding sites, frequently move the hay feeding sites or use alternative feeding methods to the bale ring feeders.

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