AgriLIFE EXTENSION
Texas A&M System

E-208
8-11

Protecting Cattle *from* Horn Flies

*Sonja L. Swiger and Jeffery K. Tomberlin**

The most damaging insect pest for beef cattle in Texas is the horn fly (Fig. 1). Research shows that a calf infested with more than 200 horn flies will weigh 15 to 50 pounds less at weaning. Horn fly feeding on dairy cows can also reduce milk production up to 20 percent.

To suppress horn flies effectively and economically:

- Identify them properly,

Photo: Jeff Tomberlin, Texas A&M University

Figure 1. Horn flies resting on the back of a cow.

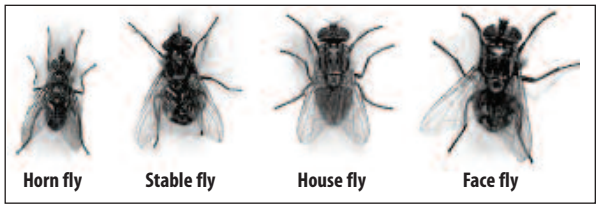

Photo: John B. Campbell, University of Nebraska-Lincoln

Figure 2. Comparison of the horn fly to the stable fly, house fly, and face fly.

- Understand the insect's life cycle, and
- Use a combination of control strategies.

Identifying horn flies

Horn flies look like house flies and stable flies but are slightly smaller (Fig. 2). Like the stable fly, horn flies have piercing mouthparts.

To distinguish horn flies from stable flies, observe their feeding behavior. Horn flies rest on an animal between feedings; stable flies remain on the animal only while feeding. Also, horn flies feed most often on an animal's back, shoulders, and sides, whereas stable flies feed principally on the legs.

Life cycle

Horn flies lay eggs in fresh manure pats, where they hatch as maggots. They develop from the egg to the adult stage within 10 to 20 days and live for about 3 weeks, feeding 20 to 30 times a day.

In Central Texas, horn flies are usually first observed in early spring. Populations tend to peak

* *Assistant Professor and Extension Entomologist, Texas AgriLife Extension Service; Assistant Assistant Professor, Texas A&M University; The Texas A&M System*

in early summer, then decline when the weather becomes hot and dry. In the fall, horn fly populations usually surge again when the temperatures drop and rainfall increases. Generally, they are no longer a problem after October or November, depending on when temperatures start to drop.

Control methods

To suppress horn fly populations efficiently, use an integrated pest management (IPM) approach. IPM relies on multiple tactics including cultural, biological, and chemical methods to suppress insect pests.

Biological control: Parasitic wasps suppress horn fly populations naturally. Producers who want to use parasitic wasps to control horn flies can order fly pupae parasitized with the wasps from insectaries in Texas or across the United States.

The parasitized pupae are best used around barns where manure accumulations allow for the development of fly pests. However, research has not proven that releasing parasitic wasps suppresses horn flies or that the use of parasitized pupae reduces them in pasture situations.

Dung beetles and fire ants also suppress horn fly populations. Dung beetles compete for manure use and shrink the manure pats where horn fly larvae grow. Be careful when applying pesticides—moxidectin and, to a greater extent, avermectin kill dung beetles.

Fire ants feed on horn fly larvae and pupae, thus reducing the number of horn fly adults. Fire ant control is effective when horn fly populations are small, but as they increase in the summer, the impact is not as apparent.

A walk-through trap designed to collect horn fly adults from cattle can also lower populations. For more information and design instructions, see http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1195.

Cultural methods: Remove and properly dispose of fresh manure from barns and stalls to interrupt the horn fly's life cycle and help prevent new populations from developing.

Chemical control: Several chemical control methods can help reduce the number of horn flies on cattle: ear tags, sprayers and dusters, feed additives, and boluses. To prevent resistance, rotate chemical classes of insecticide products each year—and even within a year—if a mid-to-late season horn fly increase warrants further insecticide applications.

Ear tags

Ear tags (Table 1) are 2- to 3-inch plastic tags impregnated with an insecticide and attached to a cow's ear. Several insecticides are formulated for use in ear tags and many brands are available. This large selection can make it difficult to decide which tag to use. For descriptions of several types of ear tag products, see http://insects.tamu.edu/extension/publications/epubs/eee-00047.cfm.

These guidelines will help you use ear tags effectively:

- Avoid tagging cattle until there are more than 200 horn flies per cow. This delay minimizes the chance for the flies to develop early-season resistance to the insecticide in the tag. If you do not tag cattle until the horn flies appear, the tags will remain effective late in the year when horn fly populations rise.
- Read the ear tag labels carefully to determine when to remove them from the animals, and do not use the tags beyond their recommended useful life. If left in longer, the flies are exposed to lower insecticide doses, which may increase chances for fly populations to develop resistance.
- Rotate classes of insecticides (not brand names of tags) every year. Most ear tags contain one of two classes of insecticide—pyrethroid and organophosphate. If you use

Table 1. Various insecticides used to suppress horn flies on cattle. Please read the label to determine if the product is approved for use on lactating animals.

Insecticide and dosage	Method	Comments
Sprays		
Permethrin (pyrethroids):		
GardStar 40 percent 4 fl oz / 25 gal water 4 fl oz / 25 gal water	 High pressure spray Low pressure spray	 1 qt coarse spray per animal. See label for other spray considerations.
Atroban 11 percent EC 1 pt/50 gal water		1 qt coarse spray per animal.
Permectrin II 8 oz/50 gal water	Use 0.5 to 1 gal spray per animal	
Rabon + Vapona		
Ravap 23 percent + 5.3 percent = 2 qt/100 gal water	Use 0.5 to 1 gal spray per animal	Treatment interval no less than 10 days. No waiting period.
Pour-ons		
Cyfluthrin 1 percent		
CyLence	Ready-to-use	Read the label for proper rate based on weight of the animal.
Gamma-cyhalothrin		
StandGuard	Ready-to-use	Read the label for proper rate based on the weight of the animal.
Lambda-cyhalothrin		
Saber	Ready-to-use	Read the label for proper rate based on the weight of the animal.
Ultra Saber	Ready-to-use	Read the label for proper rate based on the weight of the animal.
Permethrin: pyrethroids		
Synergized DeLice 1 percent + 1 percent PBO[1] 0.5 fl oz /100 lb body weight	Ready-to-use Maximum 5 fl oz / animal	Pour along the back of the animal. Do not treat more often than every 14 days. PBO[1]
Brute 10 percent	Ready-to-use	Follow label directions. Read the label for proper rate based on the weight of the animal.
Atroban 1 percent–DeLice	Ready-to-use	
Permectrin CDS	Ready-to-use	
Boss	Ready-to-use	
Ultra Boss	Ready-to-use	
Ear tags		
Organophosphate tags:		
Diazinon 18-21 percent Terminator II Optimizer	Read the label.	Follow label directions.

Insecticide and dosage	Method	Comments
Organophosphate tags (continued)		
Diazinon 40 percent Patriot	Read the label.	Follow label directions.
Diazinon 30 percent + Chlorpyrifos 10 percent Warrior	Read the label.	Follow label directions.
Pirimiphos-methyl 20 percent Dominator	Read the label.	Follow label directions.
Diazinon 35 percent + Coumaphos 15 percent Corathon	Read the label.	Follow label directions.
Pyrethroid tags:		
Permethrin 10 percent GardStar Plus	Read the label.	Follow label directions.
Beta-cyfluthrin 15 percent CyGuard	Read the label.	Follow label directions.
Zeta-cypermethrin 10 percent + PBO[1] 20 percent Python Python Magnum	Read the label.	Follow label directions. PBO[1]
Lambda-cyhalothrin 10 percent + PBO 13 percent Saber Extra	Read the label.	Follow label directions.
Combination ear tags with pyrethroids:		
Lambda-cyhalothrin 6.8 percent + Pirimiphos-methyl 14 percent Double Barrel	Read the label.	Follow label directions.

Backrubber applications

Mix the insecticide formulations listed below as directed on the label for use in homemade or commercial backrubbers. Backrubbers are most effective when placed in a forced-use situation such as gateways, doors, or alleyways. Install them so that all animals use them once a day. If backrubbers cannot be installed in a forced-use situation, place them in areas where animals often loaf. To be effective, backrubbers must be maintained and filled often. Use only No. 2 diesel fuel, No. 2 fuel oil, or an approved backrubber oil to mix insecticides for backrubbers. **Do not use fresh or used motor oils.**

Coumaphos		
Co-Ral 11.6 percent ELI	Restricted-use pesticide	
Co-Ral 5.8 percent Livestock Insecticide Spray (LIS) 4 qt/13 gal (9.75 oz/gal) of No. 2 fuel oil or No. 2 diesel fuel	Backrubbers only	
Malathion		
Malathion 57 percent EC 2.25 pt/4 gal of No. 2 diesel fuel or approved backrubber oil	Backrubbers	Follow label instructions for mixing. No waiting period before slaughter for any of these materials

Insecticide and dosage	Method	Comments
Backrubber applications (continued)		
Rabon + Vapona		
(Ravap) 23 percent + 5.7 percent 1 gal/25 gal diesel or 5 oz/1 gal diesel		
Permethrin		
Permectrin 10 percent EC 1 qt/20 gal No. 2 diesel fuel or approved backrubber oil		
GardStar 40 percent EC 4 oz/10 gal No. 2 diesel fuel or suitable mineral oil		
Permectrin II 1 qt/20 gal No. 2 diesel fuel or approved backrubber oil		
Atroban 11% EC 1 pt/10 gal No. 2 diesel fuel or approved backrubber oil		
Synergized DeLice 1 percent + 1 percent PBO 1 pt/gal No. 2 diesel fuel or approved backrubber oil.		PBO[1]
Phosmet		
Prolate 1 gal/50 gal No. 2 diesel fuel or approved backrubber oil		

[1]*PBO = piperonyl butoxide, a material that increases the effectiveness of some pyrethrin and pyrethroid insecticides*

the same class of insecticide 2 years in a row, horn flies can quickly become resistant.

- Do not use ear tags that contain both pyrethroids and organophosphates. These combination tags do not slow resistance development and may actually increase it.

Sprayers and dusters

Free-range cattle can be treated with small sprayers and dusters powered electrically from the back of a truck. Although sprays (Table 1) can also be applied during seasonal roundups, they usually do not suppress horn flies for long.

Feed additives

Confined and free-range cattle can be given feed additives that suppress horn flies. These products contain insecticides that pass through the animal's digestive system and remain in the manure where horn fly maggots develop. But, the herd will still be susceptible to biting flies moving from neighboring properties.

One disadvantage of feed additives is that it is difficult to regulate each cow's feed intake. Some animals might take in the proper amount; others might receive too little.

Boluses

Another method for controlling horn flies is boluses, which look like large pills. Boluses are

retained in the cow's reticulum (second stomach) and dissolve slowly, releasing the insecticide into the digestive tract. Unlike feed additives, boluses release the insecticide continuously in the manure and kill immature horn flies. However, the herd will still be susceptible to biting flies from neighboring properties.

Summary

Regardless of the method you choose, follow these guidelines:

- Do not treat infestations of less than 200 flies per cow. Treating when horn fly populations are below this level is not cost-effective, and the unnecessary use of insecticides can speed the development of resistant fly populations.
- Read the treatment label to ensure that it is suitable for use on beef or lactating dairy cows.
- Be careful when applying insecticides and wear protective clothing as recommended on the product label.

Acknowledgments

Ed Bynum, Allen Knutson, and Chris Sansone, Extension entomologists with the Texas AgriLife Extension Service, and Ron Swiger reviewed this manuscript.

Produced by AgrLife Communications, The Texas A&M System

Extension publications can be found on the Web at http://AgriLifebookstore.org

Visit the Texas AgriLife Extension Service at http://texasextension.tamu.edu

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, the Texas AgriLife Extension Service, The Texas A&M University System.

Revision