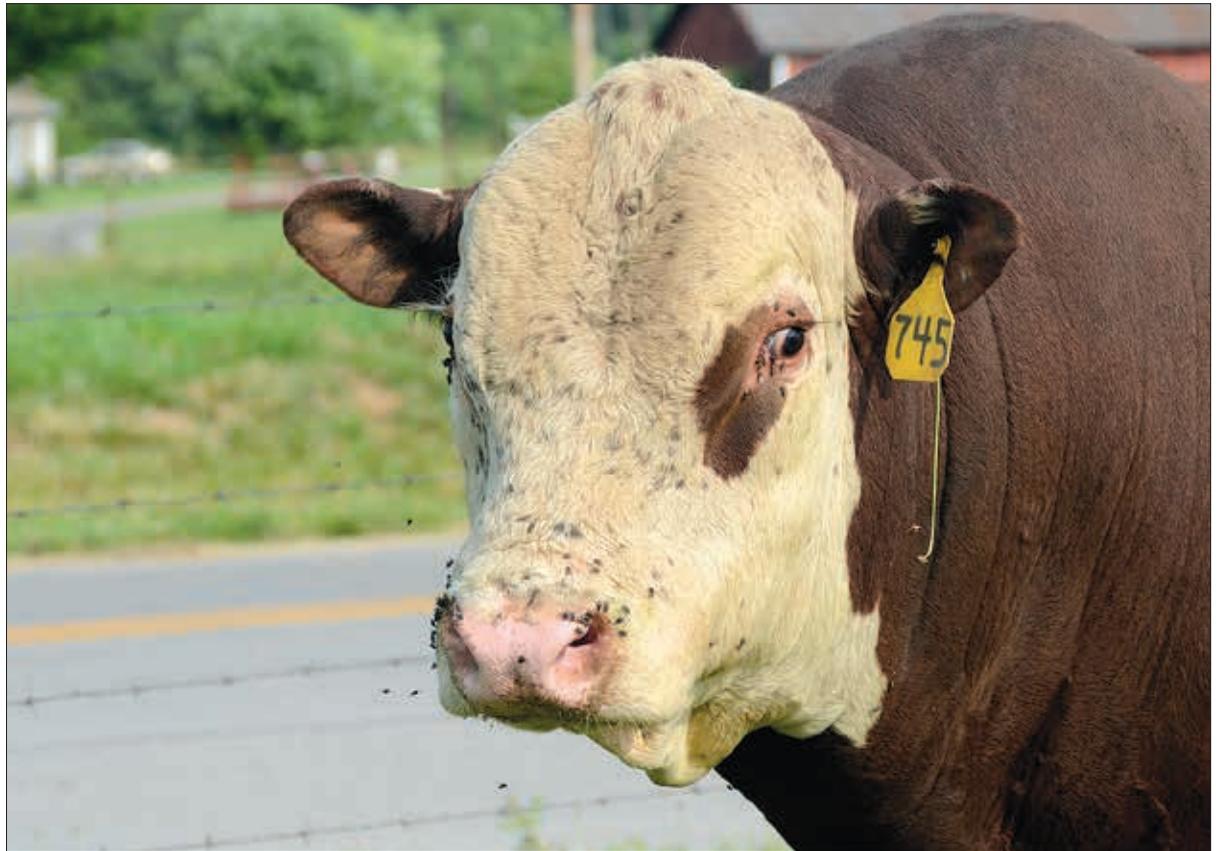


Bite Back

Consider these tips to curb the fly population in your herd.

by Heather Smith Thomas



The battle against flies is constant, but there are ways to reduce these costly pests besides pesticides and toxic chemicals. After the advent of pesticides, it became common practice to spray the premises or use chemicals on the animals themselves via pour-ons, back rubbers, insecticide ear tags, etc. But now, some flies are developing resistance, and there is more concern for the environment. Pesticides can be harmful to beneficial insects as well as the ones you are trying to control. Understanding the fly life cycle can help you find the best way to control the pests.

Flies and organic matter

Flies that breed in rotting organic matter such as old bedding and wasted hay cause a big problem in livestock operations. Bill Clymer, an entomologist and consultant in Amarillo, Texas, says the predominant fly in any geographic region is the house fly and the second most common pest is the stable fly. The stable fly is about the size of a house fly and is an aggressive biter, usually feeding on the legs and lower parts of the body. Cattle attacked by large numbers of stable flies are restless and will not eat, often grouping together tightly to try to avoid the flies.

“Stable flies don’t breed in straight cow manure like they do in horse manure,” Clymer explains. “They prefer any kind of decaying plant matter such as wet hay or old bedding. Texas A&M did a study a few years ago and found that if you don’t clean up areas where you feed big bales, this makes ideal breeding ground for stable flies.”

The research estimated that the area around one big bale feeder would foster the breeding of more than a million stable flies.

“On my own operation we unroll big round bales in the pasture, but in the corral we put bales in feeders,” Clymer says. “In

the spring, one of the first things we do when it starts warming up is move the feeders and spread out wasted hay with a front end loader, so it will dry out — or put it in a big pile so it will start heating. Otherwise this material stays wet almost all summer and continually provides breeding sites for stable flies.”

The waste needs to dry out or heat up — properly composted material becomes too hot for flies.

Clymer’s favorite advice for controlling these flies is to follow three rules: sanitation, sanitation and sanitation. Sometimes, however, no matter how well you clean up your farm, stable flies come in from neighboring areas. He recalls a place in southeastern Colorado that had a serious problem. “It was the cleanest place I’d ever seen, regarding manure management, but in the southwest corner the stable flies were terrible,” he says. “I couldn’t find any breeding sites on the property so I started driving toward the southwest — the direction of prevailing winds.”

About a mile away was a pole barn where alfalfa hay had been stored. “The hay had been taken out, leaving a thick mat of alfalfa leaves,” Clymer says. “A blowing rain earlier that season got that material wet. I dug into it with the toe of my boot and saw hundreds of stable fly larvae. We cleaned out that barn with a front end loader, scattered the litter around on the ground where it could dry, and within a day eliminated the stable fly problem.”

Cleaning up in the spring and using a biological control like predator wasps can keep the fly population from building up by summer. These tiny parasitic



wasps are sold commercially and lay their eggs in manure and rotting organic material. Their hatching larvae feed on fly larvae and pupae in the manure. The wasps can be ordered from several different companies and put out early in the season before the fly population becomes large, with more wasps put out periodically throughout the summer.

“If you can keep flies from getting ahead of you in the spring, you may not have to do as much to control them during the hottest part of summer,” Clymer explains. Heat and drying make it harder for fly larvae to survive. But a big rain makes conditions ideal again — about 10 days after the rain a tremendous increase in house flies and stable flies will be seen.

“I’ve had the best results in fly control by using sanitation coupled with parasitic wasps,” Clymer says. “This won’t have any effect on deer flies or horse flies (since they don’t breed in manure) but this can greatly reduce numbers of house flies and stable flies.”

Another biological control is the use of Muscovy ducks — a breed of meat duck that spends its time on land, rather than in water, eating insects. Some small farmers claim that four or five ducks per cow virtually eliminate a fly problem. According to Dennis French, DVM at the University of Illinois, in research trials, Muscovy ducks removed adult house flies 30 times faster than fly traps, fly paper rolls or bait cards. Ducks in cages with 100 flies took only 0.6 hours to remove 90% of the flies compared to 15.3 hours for the most effective commercial bait devices.

“In other studies, the ducks lived for 12 weeks in pens with calves, without injury or any additional feed for the ducks,” French says. “They ate about 25 house flies per 15 minute observation periods when fly populations were low to moderate.”

Horn fly overview

These flies are small, but probably cause the most problem for cattle because they spend almost all their time on the host animal. During fly season, an animal may have thousands of these flies covering neck, shoulders and back. Smaller numbers may be on the rest of the body or along the underside/midline of the belly. Cattle with horn flies continually try to rub them off by slinging their heads over their backs or walking under low-hanging brush, but the flies rise up in a black cloud and settle right back on the animal again. Horn flies have a short life cycle — about 11 days. Many generations arise during one fly season. Adult flies lay their eggs in fresh cow manure.

Studies at several universities have shown that horn flies

often reduce daily weight gain in calves $\frac{1}{8}$ to $\frac{1}{4}$ lb. per day, or more. Research at Auburn, Calif., showed that calves from herds with fly control gained $\frac{1}{2}$ lb. more per day than calves from unprotected herds. Tests in Georgia, where fly season is five months long, showed that fly control could provide as much as 40 lb. more per calf.

Horn flies can often be controlled with the proper insecticides applied in several ways. Back rubbers and dust bags can be effective if placed in gateways where cattle travel daily or on their way to water. These applicators should never be too close to a water source to avoid spillage and contamination of the water. Insecticides used for flies do not harm mammals but kill flies and other insects by affecting their nervous systems.

“Insecticide spilled into a stream could harm aquatic insects and other invertebrate life forms,” Clymer says.

Oral larvicides added to mineral mixes kill fly larvae in the manure when flies lay their eggs. The larvicide goes through the digestive tract with no harm to the animal, ending up in the manure. This control method can be effective in breaking the

in any given fly population survive the effect on their nervous system or they produce an enzyme that breaks down the chemical before it can kill them. These flies survive, and their resistance is passed to succeeding generations.

Most of the tags work best if applied at the rate of two tags per animal — one in each ear. But many stockmen put only one tag in each animal, and some use only one tag per pair in either the cow or the calf, which would be 25% of the recommended dose of insecticide. Dosage that low can result in accelerated development of fly resistance.

Some companies developed organophosphate tags that were approved for adequate control at the rate of one per animal. Tests showed these tags perform about as well as other tags but not for as long; fly control using just one tag drops dramatically after 12-14 weeks. Protection may run out when it is needed most, in late summer. After a few months the insecticide level in the tag drops below what is needed to kill flies and continues to drop until there is no insecticide left. If flies are still active after the tag has lost effectiveness, these low levels produce the same results as having too few tags at the

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life cycle and can keep cattle free of horn flies most of the summer, unless flies come from neighboring untreated herds. Even though horn flies spend most of their time on a host animal, they can easily fly a mile in a day, according to Clymer.

Pour-on chemicals and sprays can provide strong control, reducing fly populations to fewer than 100 flies per animal, but they must be administered regularly, and care must be taken in selecting insecticides that flies are not yet resistant to. Many cattlemen install insecticide-impregnated ear tags at the start of fly season, and the animal does the rest, rubbing the insecticide over shoulders and body while slinging its head at the flies.

Horn fly resistance

The first insecticide ear tags became available in the 1970s. In some regions, fly populations are no longer susceptible to these chemicals. Resistance occurs because a small percentage of flies

start of fly season, encouraging development of fly resistance. It’s wise to remove the tags in the fall.

Use of the same type of insecticide for many years will result in horn fly resistance, no matter how well managed your fly control program. Eventually, as it is recommended, rotate between synthetic pyrethroids and organophosphate insecticides.

To make sure tags are effective through the peak of fly season, don’t tag cattle too early. Cows and calves can tolerate low fly populations in early spring. The later you can put tags in, the more of the season they will cover. Several types of tags are designed to be effective for up to five months but are most effective during the first 60 days. If you wait until May or June to put them in, the better your season-long fly control will be.

Insect growth regulators

Another tactic that can be effective under certain conditions is insect growth regulator (IGR)



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hormones that guide development of immature stages of flies and other insects. If the normal concentrations are upset, flies don’t progress to an adult stage and die as maggots.

University of Kentucky Extension Entomologist Lee Townsend says several companies make a feed-through product that contains a synthetic version of IGR.

“Levels of this juvenile hormone tell the fly maggot whether it should stay a maggot longer or become a pupae and then an adult,” he explains. “Feed-through products containing IGR pass through the animal’s digestive tract and end up in the manure in small amounts — just enough to disrupt fly development.”

To be effective, there must be a certain amount of the product added to the manure. “If you are using a mineral supplement to administer this hormone, every animal must eat at least this amount, every day,” Townsend says. If some animals are under-consuming the supplement, it won’t be as effective.

“Even if you are getting good control of maggots with a feed-through product on your own cattle, there may be adults flying in from outside sources if neighbors don’t control their flies,” Townsend says. “In this situation you need a supplemental fly control strategy such as an oiler or dust bag for the cattle to use.” A multi-pronged attack usually works best, rather than trying to rely on one control method, especially if several types of flies are being targeted.

“The label for feed-through insect growth regulators specify the horn fly as the insect this product is most effective against. In a feedlot, you are more likely to

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An biologic alternative for horn fly control is the use of dung beetles.

have problems with stable flies and house flies,” Townsend says.

In a pasture situation where horn flies, rather than stable flies, are the biggest problem, with no other herds nearby, an insect growth regulator product may be helpful.

Biologic control with dung beetles

Many stockmen are trying to use fewer chemical pesticides. One alternative for horn fly control is the use of dung beetles. These insects spend their entire lives in manure. Adults use liquid contents of manure for nourishment and lay their eggs in manure. Their hatching larvae consume more manure. Dung beetles are some of our best allies for controlling parasites that depend on manure for part of their life cycle, according to Clymer. Some beetles also bury manure, which helps fertilize the soil and get rid of large accumulations of manure on top of the ground.

The beetles that feed on cattle manure are active year-round in warm regions. “Today there are more than 90 species of dung beetles in North America, including some imported during the 1970s and 1980s,” Clymer says. “Australian research found that beetles bury 95% of horn fly eggs and larvae and 90% of internal parasites passed in manure.”

Some types of dewormers and pesticides destroy dung beetles, however, killing their larval stage. Use of ivermectin and related products will eventually decimate beetle populations because fresh manure of treated cattle is toxic to beetle larvae. If you use these deworming/delousing products but don’t want to affect dung beetles, use them in early spring or late fall, so there will be several months during summer when beetles can reproduce and keep horn flies at bay. A single pat of manure without dung beetles can generate 60 to 80 adult horn flies.

Long-term control of these pest flies is better achieved with dung beetles degrading the manure than by sporadic application of a toxic chemical.

Fly traps

There are a number of fly traps available for different types of flies, and new ones are being developed. Panel traps work well for stable flies. They are made with flexible plastic with a sticky covering on each of the panels. Sunlight is reflected off the panels and attracts the flies.

“Researchers used white plastic panels around the perimeter of a property to catch flies migrating in from somewhere else,” Clymer says. “You don’t get all of them, but in the Florida study they got several hundred flies per day in each trap.”

French says some horse fly/deer fly traps are quite simple. “One is a black ball that attracts the flies. They go up underneath a canopy to get to it, and when they decide this isn’t where they want to be they fly straight up and into a jar that captures them. Another type of fly catcher, called Quikbayt, is one of the better bait systems I’ve seen – more effective than sticky strips and stink bombs,” says French.

Devices that kill flies on contact, such as the fly electrocutor, kill some flies but not all types. Townsend says house flies will go to these, but stable flies and horse flies typically do not. “Some of the mosquito magnets produce warmth and carbon dioxide and are attractive to a number of biting flies, but it’s hard to say how what percent of the fly population they kill,” he says.

“In large open areas without many sources of blood meals for mosquitoes and blood-sucking flies, a trap might be more useful than in an area where there’s vegetation or buildings and a lot of competition for the flies’ attention,” Townsend says. “We’ve used some of these traps for mosquito studies and we do get other insects and flies caught in them, but you shouldn’t rely on these to solve a fly problem.”

An effective way to control biting flies, especially horse flies and deer flies, is the Epps Biting Fly Trap™, invented by Alan Epps, an Oklahoma cattleman. He came up with this novel trap after being frustrated by the failure of other methods to control horse flies. In summer his steers were covered with flies and dripping blood from the bites with big welts all over their bodies. He’d tried insecticides on the cattle, but nothing worked well or for very long.

Epps’ trap is now produced and marketed by Horseline Products. Flies are attracted to the shape

and silhouette of an animal, so Epps made a framework of wood to attract them. The frame has a large contrasting surface area, utilizing a dark portion and transparent panels to simulate air space above an animal and under its belly – the areas flies normally circle before landing to bite. When flies hit the transparent sheets they ricochet into trays of water below and drown. Adding a few drops of dishwashing soap will break the surface tension of the water so insects can’t float on it – they are immediately wetted completely, sink and drown.

Natural resistance

Some cattle tend to be resistant to horn flies. In every breed and in every herd, there will be some individuals with fewer flies. Color and gender make some difference – flies are more attracted to black animals and to males. Bulls tend to have more horn flies than most females, as testosterone attracts the flies. Even with these generalizations, however, some individuals are more resistant.

A study looking at horn fly density on 215 beef cows in seven different breeds and 51 different sires was done at the University of Arkansas in 1991. Consistent differences in the number of flies observed on individual animals had already been reported in earlier studies, with suggestion of genetic differences. In the Arkansas study, the total horn fly numbers were determined once a week on each individual cow from May through October. No insecticides were used on the cattle.

Horn fly resistance seems to be an inherited trait. Observed in the study were 126 daughter-dam pairs and a number of maternal half-siblings. Cattle may be selected for horn fly resistance. Some traits become interrelated if no insecticides are used, and cattle that have poor resistance also tend to have poor performance because of the drain on them from flies. Cows drop in milk production, pregnancy rates and body condition. Calves grow slower, weigh less at weaning and take longer to reach optimum breeding weight as yearlings. Before the days of insecticide products, these poorer-producing animals were often culled, leaving the more resistant animals in the herd to reproduce. Over time, a higher proportion of the herd would be more resistant to flies.

With the advent of insecticide products, however, selection for parasite resistance has been largely overlooked – for about four decades. If you want to save money on fly control, genetic selection for fly resistance could be added to the traits evaluated when you are keeping breeding stock. **HW**



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