Shoo, Fly, Shoo

Control profit-robbing flies.

by Jami Stump

You must be relentless to win this war. They are annoying, overpopulated and taking a bite out of your pocketbook. Go after them with insecticides, larvicides, sprays, dust bags and face rubbers. You must strategize to keep them from winning the war.

A nuisance to cattle and producers alike, flies cut into profits and transmit infectious diseases. Producers must play a major role in controlling these pests.

Nancy Hinkle, Extension veterinary entomologist at the University of California, Riverside, says losses contributed to flies can be up to 50% of all performance losses. This makes it well worth a producer's time to consider fly-control measures before the problem gets out of hand.

"Hold flies in disdain if you wish, but it's well worth the bother to learn to recognize each of the common cattle pest species and the different ways they interact with cattle," says Don Mock, professor of entomology and Extension specialist in medical and veterinary entomology at Kansas State University, Manhattan.

"Only then can you choose the right products or management inputs for avoidance or control, time the inputs for greatest effects, and reap the most benefits for your time and expense," he says.

Mock says flies can be divided into three categories—biting, nonbiting and those that cause myiasis—based on how they affect cattle. Myiasis is the term for larvae that develop in living flesh.

Biting flies

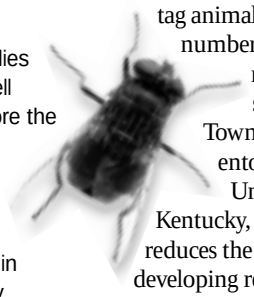
The biting-fly category includes the horn fly, stable fly, horse fly, deer fly, mosquito, black fly, Culicoides gnat and eye gnat. They feed by piercing the animal's skin with their sharp mouthparts and sucking blood. Biting flies cause economic losses by reducing rates of gain.

"Reduced performance is caused by blood loss, irritation, nervousness, lack of comfortable rest and immune response, which physiologically affects many organ systems in the animals," Mock points out. "Biting flies are implicated in transmitting anaplasmosis, vesicular stomatitis, mastitis and epizootic bovine abortion."

The horn fly causes the greatest economic loss for producers. Alone, it is estimated to cost the U.S. beef industry almost $700 million annually.

The horn fly is black and appears to be covered with a grayish powder. It is about half the size of a house fly and is a pest to cattle throughout North America. Horn flies stay on cattle most of the time, crawling and feeding among the hairs on the back, sides or belly.

One of the most effective and commonly used methods of horn-fly control is insecticide-impregnated ear tags.



"For fly control it is best to tag animals after horn-fly numbers reach 50 or more per side," says Lee Townsend, Extension entomologist at the University of Kentucky, Lexington. "This reduces the chances of developing resistance to the active ingredients that are being used."

Townsend adds that tags provide 12-15 weeks of fly control. Tagging too early could mean not providing sufficient control in the fall to help fight the overwintering fly population.

Ear tags contain one of two main types of active insecticide ingredients. Organophosphate insecticides, such as diazinon, fenthion, pirimiphos methyl or a combination of diazinon and chlorpyrifos, provide good horn-fly control and moderate face-fly control.

Synthetic pyrethroid insecticides include fenvalerate and permethrin. Tags that contain these insecticides are sold under a variety of brand names. They are usually less expensive than the newer synthetic pyrethroids, such as cyfluthrin, lambdacyhalothrin and zeta-cypermethrin.

"The two groups of tags contain insecticides that attack the nervous system of the fly in different ways," Townsend says. "Seasonal rotation between the two can be useful in combatting insecticide resistance that has developed in horn flies."

Townsend points out that flies become immune when tags containing synthetic pyrethroid permethrin are used for several consecutive seasons. No immunity to organophosphates or the new synthetic pyrethroids has been observed.

When applying ear tags, producers should wear gloves, even if not specified on the package.

"The concentration of insecticide in the tags varies from 8% to 40%," Townsend says. "The insecticide, if handled with bare hands, can be transferred easily to the mouth, eyes, face or other areas of the body. Some individuals can be very sensitive to the active ingredients on the tags."

All tags should be removed from the animal in the fall after the first frost.

Other methods of fly control include pour-ons, spot-ons, dust bags, sprays, feed additives, boluses and oilers. Dust bags,

oilers, sprays or pour-ons can be effectively used in mid-August as a supplemental treatment method.

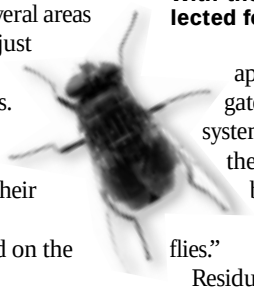
John Campbell, research and Extension entomologist for the University of Nebraska, North Platte, says that since sprays, pour-ons and spot-ons only control flies for a short period of time, the stress to the animal probably offsets the benefits.

"To keep the horn-fly population below the economic threshold would require treatment at least every three weeks," Campbell says. "However, those methods can be used in mid-August to supplement ear tags."

PHOTOS BY SHAUNA ROSE HERMEL

With the genetic heritability for fly resistance pegged at 0.58, cattle can be identified and selected for that trait.

Stable flies, in several areas of the country, are just as critical to control as horn flies. They are dark gray and have dark irregular spots on their abdomens. They predominantly feed on the legs of an animal.



Campbell says stable flies are the most important insect pest on feeder cattle during the summer in Nebraska.

"Heavy stable-fly populations during hot days may cause cattle to go off feed, resulting in weight-gain depressions of 0.48 pounds per day," Campbell says. "Our research indicates that stable-fly-population levels of five flies per front leg, counted on the outside of one leg and the inside of the other, is the economic-injury threshold."

Campbell suggests improved sanitation as the first step to controlling stable flies. The female fly deposits eggs in spoiled or fermenting organic matter mixed with animal manure and dirt. Manure should be removed or mounded and packed.

"If sanitation is not practiced, chemical control may be unsuccessful," Campbell says. "Clean around feedbunks, feed aprons, under fences and gates, around water systems, and at the edges of the mounds. Even small breeding areas support very high numbers of flies."

Residual sprays can be used on surfaces — like fences, feedbunks, buildings and vegetation surrounding cattle lots — after the temperature reaches 80° F.

"Residual insecticides should be effective for 10 days unless washed off by rain or broken down by high temperatures or bright sunlight," Campbell says. "Flies will rest on the treated areas and absorb the insecticide."

Other methods of stable-fly control include area sprays, animal or wet sprays, and biological control, such as releasing wasps to help control fly populations.

Nonbiting flies

Face flies cause significant losses for cattle producers. These nonbiting flies feed on secretions around the animal's eyes, nostrils and wounds, including those made by biting flies.

Face flies commonly transmit infectious bovine keratoconjunctivitis (pinkeye) and other eye diseases.

They closely resemble the house fly, another nonbiting fly, but are slightly larger and darker. The abdomen on the male face fly is orange and the female has an orange stripe.

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"The mouthparts of the fly have small stomatal teeth, which are employed in a rasping manner when feeding," Campbell says. "This feeding creates a wound in the eye tissue, which attracts more flies and provides an avenue for disease entrance."

CONTINUED ON PAGE 394

Shoo, Fly, Shoo continued

Controlling face flies is difficult due to location. Campbell recommends dust bags in forced-treatment situations — when the animal has to pass under the bags to obtain water, feed or mineral.

Dust bags should be hung with the broad side facing east to west to prevent waste due to wind. If dust bags are free-choice, they should be placed in a location frequented by cattle and in enough numbers to provide access for all the cattle. They also need to be low enough to treat calves.

Oilers are another method recommended to control face flies. They can be made by wrapping burlap around chains, cables or wires and suspending them between posts, or they can be purchased.

"Insecticides for use in oilers are usually diluted with No. 2 diesel fuel, which extends the residual value of the insecticide and retards evaporation," Campbell says. "There are some commercial mineral feeders that are provided with dust or insecticide oiler dispensers that seem to provide good control on cows but may not provide much control on calves."

Insecticide-impregnated ear tags, sprays and feed-additive insecticides incorporated in a mineral block or added to feed are all effective in controlling face flies.

"If face-fly populations are high, control may require more than one method of treatment," Campbell says. "It has been found that dust bags or oilers used in combination with animal sprays provide the best control."

Plan ahead

Experts suggest that producers think ahead about their fly-control methods after identifying fly types. Only then will optimal results be achieved.

"In most of the nation, there are a few months of respite from flies, but cattle producers should use that time to review what they did the past season and how well it worked," Mock says. "Producers should seek information from their county Extension agricultural agent and land-grant university entomologists, read, inquire, and plan their fly-management strategies for the future." AJ

Plagued by biting flies, cattle suffer blood loss, irritation, nervousness, lack of comfortable rest and decreased immune response, resulting in reduced performance. The horn fly causes the greatest economic loss, estimated at $700 million annually.

Self-control

A switching tail may look to be the cow's only defense against flies, but researchers say she has other mechanisms at her disposal.

Studies conducted at the University of Arkansas (UA), Fayetteville, show that genetics, hair coat, chemical secretions from hair follicles and protein in blood plasma may be natural defenses against flies.

GENETICS. Animal scientists have collectively identified that the genetic heritability for fly resistance is 0.58. With that number well over 0.3, the point when genetically heritable traits begin to be observed, cattle can be identified and selected for fly resistance.

"We have found you can consistently identify high-fly cows, and that trait is passed on to her offspring," says Dayton Steelman, UA professor of entomology. "For producers this means you can cull her and reduce the number of high-fly cows in your herd or, if you don't want to cull her, you can use different types of insecticides to protect her."

Steelman encourages breeders to use fly-resistance as one of their criteria for selecting bulls and female replacements. The result will be more money in the bank.

HAIR COAT. By doing research on different sizes of Angus cattle, Steelman has identified that the number of hairs per unit of area plays a significant role in fly resistance. His research stemmed from the obvious differences in the number of flies on different cows of the same breed.

"Cattle of larger frame size have the same number of hairs on their body as smaller-sized cattle," Steelman describes. "The difference is that their hair is spread out over a larger area, resulting in less hair per unit of area than smaller cattle."

The distance between hairs in a given unit of area is important because of the chemicals that are secreted by the hair follicles.

HAIR-FOLLICLE CHEMICALS. Researchers agree that each hair follicle has two sebaceous glands and a sweat gland associated with it. These glands secrete chemicals that repel flies.

"The greater the number of hairs per unit area, the greater number of glands to secrete chemicals and, in result, repel away flies," Steelman says. "We are working to identify these chemicals so that we can utilize that information in coming up with new control products."

Steelman says he is still unsure of whether the chemical prevents the horn fly from feasting or the chemicals are actually distasteful.

PROTEIN MARKERS. Another area of study is determining if protein markers in blood plasma play a role in fly resistance.

"We have identified two proteins that fly-resistant cows have in greater quantities," says Steelman. "We believe that these proteins act as a marker, and by taking blood samples of animals, a producer could identify those animals [that] need treatment because they have low amounts of this protein."

Steelman says this area needs more research, but the initial results indicate that protein markers give cattle and producers another weapon against flies.