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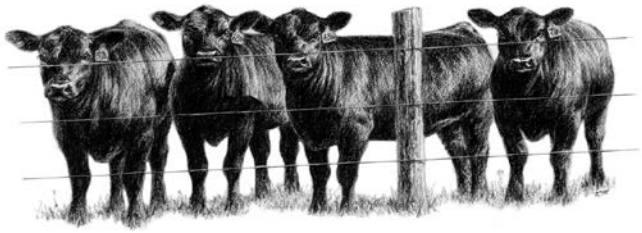
The Tick & Fly Management Edition



BAXTER COUNTY U OF A COOPERATIVE EXTENSION SERVICE NEWSLETTER

April 2021

In this Issue.....

From the County Agent's desk…

Well, we've made it to April, and we've had some pretty wild weather since the February newsletter came out. We had more snowfall than we've had in recent years, and record lows with temperatures dropping well below 0 for many places. What impact that has had and will have on cattle and forages is a little unprecedented for our area. Cattle can withstand that kind of cold, for the most part, as there are beef cattle raised in much colder parts of the country. Severe frostbite on ears is probably the most common issue folks saw because of the cold. Also, some bermudagrass will likely be winterkilled. Will it affect fly and tick populations? Doubtful. Those critters can survive and overwinter in much colder, longer-lasting conditions. As a result of feedback from the Baxter County Extension Ag Committee, this spring and summer, we're going to have a heavy focus on managing flies and ticks in cattle. As such, this spring edition of the newsletter is going to be all about managing those pests and the disease associated with them.

Managing Flies and Ticks on Cattle

Dr. Kelly Loftin, Extension Entomologist

Face Flies

Face flies became common in Arkansas during the late 70's and early 80's after their accidental introduction into North America in the 1950's. Face flies tend to be a bigger issue for cattle producers in the northern half of Arkansas. Although this pest fly does not reach pest status every ear like the horn fly, it will be observed almost every year in north Arkansas. Peaks in their populations usually occur in June and often again in late August.

Economic losses related to face flies include reduced weight gain and milk production as well as their potential role in pinkeye. Face flies are mechanical vectors of *Moraxella bovis*, a bacterium responsible for infectious bovine keratoconjunctivitis (IBK or pinkeye). *Thelazia* spp., a nematode eye worm, can be transmitted to horses and cattle by infective face flies. In fact, I own a mare that was diagnosed with thelaziasis last summer. In addition, to being an important livestock pest, face flies can become a significant nuisance to homeowner if they overwinter in their homes.

Biology

The face fly is not a blood feeder like the horn fly; instead, it feeds on the secretions around the eyes, nostrils or on wounds of animals. Only female face flies feed on the animal; while males feed on nectar. Face flies are intermittent feeders spending a limited amount of time feeding on the animal. Most of their time is spent resting in vegetation or on fences. Female face flies will only lay eggs in fresh bovine manure that is less than 10 minutes old. Eggs hatch into maggots which continue to develop until they reach the pupal stage. Mature maggots pupate in the soil under and around the manure pat. The lifecycle from eggs to adults takes from two to three weeks. Face flies diapause (overwinter) as adults in protected areas such as barns, attics, uninsulated walls, etc. and emerge in the spring.

Face flies (~30) feeding around the eye of a horse. Photo by Kelly Loftin.

Face flies feeding on a calf. Photo by Clemson University CES.

Control

Face flies should be controlled on cattle before they reach more than 10 per head. On cattle they are difficult to control for a couple of reasons: 1) flies feed on the face which is difficult to treat and 2) they spend a significant time off the host. Daily insecticide treatment maximizes control. For this reason, self-application devices such as dust bags and back rubber equipped with face flips or specific insecticide impregnated ear tags are generally more effective. Both cattle and calves should be treated.

Self-treatment devices should be placed in such a manner that cattle are forced to use the device daily. This is easily accomplished by restricting access to water or mineral which requires cattle to pass through the device daily. Dust bags should be hung in pairs at a height and spacing that results in application to the face (for face flies) and back (for horn flies). Active ingredients used in dust bags include: coumaphos, tetrachlorvinphos, permethrin and zeta-cypermethrin. Back-rubbers charged with an insecticide and fuel or mineral oil mixture and equipped with face flips (burlap or canvas cloth strips affixed around the back-rubber) is a good treatment option for face flies (and also controls horn flies). Active ingredients used in back-rubbers include coumaphos, phosmet,tetrachlorvinpho/dichlorvos combination, permethrin and permethrin/piperonyl butoxide combinations.

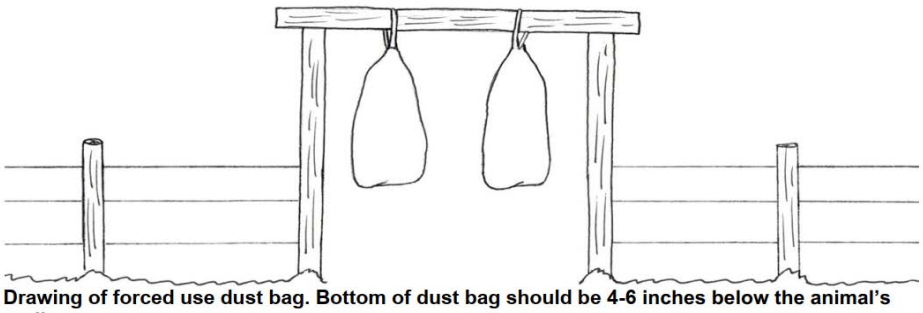
Not all **insecticidal ear tags** are equal in controlling face flies. Some are effective while others only provide some reduction. Ear tags such as Corathon®, CyGyard®, CyLence® Ultra, GardStar® Plus, Python® and Saber® Extra provide reasonable face fly control. Apply two tags per animal; one in each ear.

Specific pour-on insecticides that allow treatment of the face will provide face fly control but may not provide enough residual activity to maintain low face fly number between the minimum application frequencies. **Pour-on insecticides** that allow application to the face include specific pyrethroids such as Ultra Boss®, Permectrin® CDS and CyLence®. **Insecticide spray formulations** are effective in controlling face flies when directed toward the face. However, they may not provide the residual activity necessary to provide control between the minimum spray frequencies.

Insect growth regulators such as methoprene or diflubenzuron applied to feed or minerals and fed to cattle reduce larval development but are not designed to kill adult flies. In circumstances where cattle herds are somewhat isolated from untreated herds and sufficient consumption by the animals can be maintained, IGR feed-through insecticides can be effective against both horn and face flies.

Drawing of forced use back rubber.

Back-rubber equipped with face flips.



Drawing of forced use dust bag. Bottom of dust bag should be 4-6 inches below the animal's topline.

Although face

egg-laying and larval development, face flies readily feed on horses resulting in severe nuisance and potential transmission of eye diseases. Face fly control on horses is a bit easier than control on cattle. This is simply because horses are companion animals and are accustomed to being handled which allows for daily treatment when needed. Several pyrethroid products can be applied around face (but not in the eyes) of horses. Examples of these **paste, ointment or roll-on formulations** include War Paint® Insecticide Paste, Swat® Clear fly repellent ointment, Endure® Roll-on for Horses, Flysect® Roll-on repellent face lotion and Farnam™ Roll-on fly repellent.

Always read and follow directions on the insecticide label. A listing of insecticides uses to control face flies and other pests of cattle and horses is available in the 2020 Insecticide Recommendations for Arkansas at: https://www.uaex.edu/publications/mp-144.aspx.

Horn Flies

A horn fly (*Haematobia irritans*) is about half the size of a house fly and spends most of its time on the back, head and shoulders of its host. They also feed on the belly and legs. In addition to being smaller than the house fly, horn flies can be differentiated by piercing mouthparts that resemble a beak. Horn flies briefly leave the animal to deposit eggs on fresh cattle manure (less than 10 minutes old).

Both sexes feed on cattle and take 20 to 40 blood meals per day. Although rare, populations of up to 10,000 per animal have been documented.

Development from egg to adult requires as little as 9 to 12 days, writes Dr Loftin. Larva hatch and develop within the manure. Mature larvae migrate to the lower portion of the manure pat or in the soil to pupate. Adults immerge from pupa after about 5 or 6 days.

Horn flies survive the winter as pupae in the soil. After the adult emerges, it seeks a host to begin

blood feeding. An adult female may begin laying eggs three days after emergence and may lay up to 400 eggs during her lifetime. With such a short life cycle, several generations per year are possible, allowing this pest to develop insecticide resistance.

In Arkansas, two seasonal population peaks occur, one in the late spring and one in the late summer or early fall. Complete elimination of horn flies is impractical and impossible. Most research suggests that economic damage occurs in dairy cattle when 75 to 100 horn flies per animal are present. For beef cattle, this threshold is about twice (150 to 200) that number.

Monitoring horn fly populations is important in managing this pest. Populations are monitored by counting the number of horn flies on the heads, shoulders and backs of at least 10 cows. Average counts approaching 75 to 100 horn flies per animal (dairy cattle) indicate that economic loss may occur and that control measures are necessary.

Horn fly control methods vary widely. Insecticide-impregnated ear tags, self-treatment devices such as back rubbers and dust bags, pour-on insecticides and sprays are the most common method of applying contact insecticides. Other methods include feed additives containing insect growth regulators, walk-through sprayers and walk-through traps.

The walk-through trap is a nonchemical method that traps flies that are brushed off
the Insecticide-impregnated ear tags are economical, easy to use and can provide long-term control. As a result of these attributes, ear tags are often overused or misused, resulting insecticide-resistant horn flies.

This misuse and other factors, such as the short generation time (2 weeks) and multiple generations per season (~10), contribute to insecticide resistance potential. The active ingredients of insecticide-impregnated ear tags fall into three insecticide classes: synthetic pyrethroids, organophosphates and macrocyclic lactones.

To mitigate potential insecticide resistance, rotate insecticide class and remove ear tags at the end of the fly season or when they fail. Also, if ear tags are applied too early, they may fail late in the animal as it passes through the trap. The walk-through sprayer (3-D Quik Hand Cattle Sprayer) sprays the animal as it passes through the sprayer. Both walk-through methods are well suited for some dairy operations. season because of normal loss of insecticide activity or possible resistance.

Remember to study the label prior to insecticide purchase and use. Some insecticides registered to use on beef cattle or non-lactating dairy cattle cannot be used on lactating dairy cattle. The animal sections of MP144, Insecticide Recommendations for Arkansas, and FSA7031, Controlling Horn Flies on Cattle, provide more detailed information on insecticides and horn fly control. Both are available at your county Extension office or online at http://www.uaex.edu/publications/mp-144.aspx (MP144) and http://www.uaex.edu/publications/PDF/FSA-7031.pdf (FSA7031), respectively.

Ticks

Recent surveys showing prevalence of anaplasmosis in Arkansas cattle has renewed interest in tick surveillance and control. Anaplasmosis caused by the bacterium, *Anaplasma marginale*, can be transmitted to cattle by the bite on an infected tick, mechanically by biting flies such as horse flies or through contaminated veterinary equipment (some ear taggers, hypodermic needles, etc.). Transmission by infected ticks is different than transmission through biting flies or contaminated equipment in that ticks are true biological vectors. In a biological vector the causal organism (in this case *A. marginale*) lives, receives nourishment and may multiply within the tick. In addition, *A. marginale* remains in the tick as it molts from one life stage to the next (larval (seed) tick, nymphal tick and adult tick, referred to as transstadial transmission). In addition to potential disease transmission, ticks are of economic importance resulting in conditions such as “gotch” ear, tick paralysis, loss of condition, lowered weight gain and in severe cases, anemia.

Types of Ticks

The **American dog tick** is considered a potential biological vector of *A. marginale*, the causal organism of anaplasmosis in cattle. It is also the primary vector of Rocky Mountain Spotted Fever (RMSF) in humans and can also transmit *Francisella tularensis*, the organism causing tularemia. In addition, it may cause tick paralysis. Tick paralysis can occur when the tick attaches the base of the skull and feeds for several days. The tick is thought to release a salivary gland protein into the body that causes the paralysis. If the tick is not removed, respiratory failures can cause fatality. Normally once the tick is properly removed, recovery occurs within hours to a few days. Tick paralysis may occur in cattle, dogs and humans. However, human cases are rare and are usually in children when tick attachment goes unnoticed.

The **winter tick** is a one-host tick that is encountered on Arkansas cattle. This tick also feeds on other large mammals such as horses, mules, deer, elk and moose. The winter tick is considered a potential vector of *A. marginale*, the causal organism of anaplasmosis. In areas where **lone star ticks** are abundant, they can reach intense densities on cattle, especially in areas with high white-tailed deer densities. High tick densities on cattle can adversely impact production through lowered weight gains and loss of condition. The **Gulf Coast tick** is a three-host tick that is now established across the state. This tick feeds on large and small mammals as well as birds. On cattle, it tends to feed inside the ears causing a condition referred to as “gotch” ear. This condition results in swollen, deformed, curled, drooping and sometime necrotic ears. In addition, the Gulf Coast Tick transmits *Hepatozoon americanum* to dogs and coyotes which is an often fatal, tickborne protozoal disease of dogs in the United States. In humans, Gulf Coast ticks are capable in transmitting *Rickettsia parkeri*, one of the spotted-fever Rickettsial diseases.

Control

Tick populations on cattle vary widely and densities are influenced by habitat and abundance of alternate hosts in the area such as white-tailed deer. Woodland pastures are often associated with higher populations of American dog ticks, lone star ticks and blacklegged ticks. Gulf coast ticks are more often associated with grass prairies. Lone star tick (male left, female right) can severely infest cattle. It is also a primary vector of human ehrlichiosis, STARI, Heartland Virus, spotted fever group Rickettsia and one of the vectors of tularemia. This tick is also associated with Alpha-gal Allergy.) The abundance of most tick species is also influenced by the availability and abundance of alternate wildlife. Generally, the greater the abundance of suitable wildlife hosts the greater the tick density. Habitat modification such as brush control can reduce the humidity necessary for ticks to thrive and reduce tick populations in localized areas. Wide-area use of acaricides applied to pastures is not feasible or practical for most production systems. In specific situations such as small horse lots or cattle working areas with an abundance of ticks, acaricides applied to the environment can provide temporary relief. Current methods of tick control on cattle include whole body sprays, self-treatment devices, pour-on insecticides, ear tags and dips. Plunge dips were a very effective method of tick control used into the 1950's in the cattle fever tick eradication program. This method has been replaced by the spray dip machine that is primarily used in the cattle fever tick eradication program in south Texas. **Whole body sprays** are also effective for tick control. Care should be taken to treat hard to reach areas such as beneath the body and around the tail. The downside of this method is that cattle must be gathered, handled and may require additional applications during the tick season. Product used for on-animal tick spray applications include permethrin, CoRal® (coumaphos), Prolate/Lintox HD™ (phosmet), Rabon® 50 (tetrachlorvinphos), and Ravap® EC (tetrachlorvinphos/dichlorvos). **Pour-on insecticides** exhibit limited effectiveness against ticks. Most all pyrethroid pour-on insecticides are only labeled for horn flies and lice. However, some permethrin pour-ons synergized with piperonyl butoxide, such as Permectrin® CDS and Martin's® Fly-Ban pour-on are labeled for tick control. All **insecticide impregnated ear tags** are effective against non-insecticide-resistant horn flies and some are effective against ticks and face flies. Although most insecticide ear tags are effective against ear ticks such as Gulf Coast and spinose ear ticks, only a few will aid in the control of other tick species such as the lone star tick and American dog tick. For example, XP 820® is labeled to control ear ticks, American dog ticks, cattle fever ticks and lone star ticks. **Self-treatment devices** such as dust bags can be effective against horn flies, face flies and ticks if properly used and maintained. Dust bags should be hung in pairs at a height and spacing that results in as thorough an application as possible so that a good portion of the neck, back and sides are treated. Dust bags should be placed in an entryway so that only way the animal can gain passage to feed, minerals or water is by passing through the dust bags (restricted access). Although multiple dust formulations are available, Python® (zeta-cypermethrin) dust is labeled to control horn

flies, ticks and lice and will aid in the control of face flies and stable flies. Products and methods used to control ticks usually provide good control of horn flies as long as the horn fly population is not resistant or tolerant to the product. Consult MP 144 – "2021 Insect Recommendations for Arkansas" at https://www.uaex.edu/publications/mp-144.aspx for products listed to control pests on cattle or other livestock. Always read and follow all directions on the label.

Pinkeye

Pinkeye is a serious problem in pre-weaned calves, hitting cattle producers in the pocketbook, warned Dr. Jeremy Powell, associate professor/extension veterinarian with the University of Arkansas Division of Agriculture. "Pinkeye is the second most prevalent disease issue affecting unweaned beef calves over three weeks of age," he said. "The estimated loss to the U.S. beef industry from the disease is an estimated $150 million annually."

The disease also hits producers in the pocketbook because of decreased weight gains and poor performance, he said. The disease can leave cattle with scarred corneas or a "blue eye", leading to discounts when marketed. A recent study of more than 45,000 calves over a 20-year period indicated that cattle that had suffered from pinkeye were an average of 20 pound slighter at weaning, compared to healthy calves.

Pinkeye, caused by infectious bacteria, peaks during the summer months. Face flies commonly transmit the disease. "The flies move from animal to animal spreading the bacteria," he said. Other factors contributing to disease onset include UV light, a dusty environment, and seed heads from tall grass.

"All cattle breeds are susceptible to pinkeye," Powell said, "but breeds that lack pigmentation around the eye have an increased prevalence of this disease."

Initial symptoms include eyelid swelling and increased tear flow. As it gets worse, the eye will turn red and the animal will squint. Inflammation of the lining of the eye appears, and the cornea becomes cloudy and appears blue or white. The animal becomes less productive.

Powell said producers should treat an infected animal as soon as possible. Typical treatment targets the bacteria and provides protection to the affected eye from further irritation. Long-acting oxytetracycline is effective at killing the bacteria. It can be injected under the skin of the neck at 4.5cc per 100 pounds of body weight. Antibiotics can also be directly administered into the affected eye either by topical application or by injecting them under the outer lining of the eye. Multiple treatments may be required and could be repeated every three to four days. If the problem is severe, Powell recommends an eye patch to eliminate repeated irritation by flies and environmental factors. "Recovery from this disease can be slow, and occasionally the cornea may retain a permanent discoloration," he said.

To prevent the disease, cattle producers should do all they can to control the factors that contribute to the disease, Powell advised. Attempts should be made to control fly populations with insecticides. Controlling flies with ear tags, dust bags, sprays or pour-ons will limit the disease spread in a herd.

Mowing tall grass in the pasture and providing shade in the summer months is recommended. Vaccines are also available for use in preventing this disease. Some vaccines require a booster dose to be effective during the first year of use.

Anaplasmosis

Anaplasmosis is an infectious bacterial disease in cattle that infects red blood cells. It is transmitted from animal to animal by biting flies (horsefly, stable fly), ticks and contaminated needles or surgical instruments (dehorners, castration instruments, tattoo instruments).

This disease is typically age related. Calves less than one year of age usually show no symptoms of this disease and are considered mild. Cattle 12 to 24 months of age can show acute signs of the disease, but it is rarely fatal. However, animals that are two years and older will show acute signs of the disease, and mortality rates may be as great as 50 percent if animals are left untreated. Some cattle that do survive without treatment may become carrier animals for this disease. They will serve as a reservoir and be an underlying source of infection for other susceptible cattle in the herd. Animals in the carrier phase usually show no clinical signs and rarely become ill a second time with the disease.

Outbreaks generally occur in late summer and early fall. The incubation period is from 21 to 45 days, with an average length of 30 days. Once the red blood cells initially become infected, the organism replicates itself in order to infect more red blood cells. During this period, the infected animal shows little or no signs of illness. At some point, the infected animal's immune system begins to respond and attempts to attack the invader. When this occurs, the immune system destroys the pathogen but also destroys the infected red blood cells. As a result, the signs of clinical anemia will appear. Early clinical signs include a rectal temperature of 104°F to 107°F, a decrease in appetite, pale mucous membranes, lethargy, a decrease in milk production and weakness. As the disease progresses, other signs may be noted such as weight loss, yellowed mucous membranes, constipation, excitation, abortion and death. Death is due to a large number of red blood cells being lost. This inhibits the animal's ability to provide adequate oxygen to the tissues, and death occurs due to anoxia (suffocation).

Prevention of this disease can incorporate many factors. Insect control can be difficult, but pesticide applications to the herd may limit the number of potential vectors. With a VFD, veterinary feed directive, feeding chlortetracycline at the rate of 0.5 mg per pound of cow body weight during the vector season will help prevent transmission of anaplasmosis. CTC may be included in medicated feed, mineral mix or feed blocks. It also is important to be mindful of contaminated needles or instruments. When performing herd work, change needles often, and keep castration knives, dehorners or tattoo instruments in disinfectant between uses. Vaccines are also available to help with the control and prevention of anaplasmosis. Contact your veterinarian for additional prevention or treatment protocols.

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