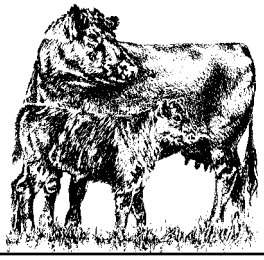

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Animal Health Section 691

External Parasites: Economic Impact, Control, and Prevention

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The economic losses to livestock as a result of insect parasites runs into many millions of dollars each year in the U.S. The horn fly, face fly, and heel fly are the major summer pests. Cattle lice and grubs are considered to be the biggest "winter season" pests.

Specific products for parasite control are not mentioned in this presentation. Please consult your local extension educator for control recommendations. Before any pesticides are used, read and follow the label.

Damage Caused by Arthrod Parasites on Livestock

Parasitic arthropods, by definition, obtain some benefit from their association with their animal hosts, and in so doing, harm that host. Damage that these arthropods can do can be divided into these categories—direct damage, indirect damage, and associate effects.

Direct Damage

Blood Feeding: Some arthropods like mosquitoes and ticks feed on blood in order to obtain the necessary proteins to develop their eggs. When large numbers of these parasites are present, animals may develop anemia, and in some rare instances, even may die from loss of blood.

Tick Paralysis: Certain species of ticks, while blood feeding, secrete a toxin in the anticoagulent they use to prevent blood from clotting. This reaction, known as tick paralysis, produces slow, wasting disease that may even result in death if the ticks are not removed from the base of the skull. Removal results in instant recovery.

Damage to Products: Mites, lice, and myiasis-producing maggots may damage hair, hide, wool, feathers, and meat, thus making them unsuitable for sale.

Altered Behavior: Livestock under attack by arthropod pests may alter their behavior to avoid the pain and annoyance associated with ecto-parasites. This may prevent them from feeding and producing at the level that might be expected without interference. Examples include head shaking, stampeding, congregating in a circle with their heads in the middle, wading in water, and severe, persistent scratching.

Indirect Damage

Disease Transmission: Some arthropod parasites serve as vectors by transmitting disease pathogens from one animal to another. These organisms include viruses like equine encephalitis, bacteria like the one responsible for pinkeye, and rickettsial organisms like anaplasmosis.

Injury: When animals attempt to flee from insect attack, they may suffer from injury, spontaneous abortions, bruised udders, etc.

Stress-Related Pathogens: Loss of vigor due to the direct damage inflicted by arthropods may cause hosts to become more vulnerable to pathogens such as shipping fever and other problems associated with stressed animals.

Secondary Infections: Secondary infections may have entry points in damaged hide and wool due to ectoparasitic invasion that later may produce serious abscesses.

Associate Effects

Flies Associated with Animal Waste: Large numbers of flies are often associated with livestock confinement. This may negatively affect sanitation and may leave the producer susceptible to litigation by angry neighbors.

Breeding Efficiency: Breeding efficiency may be reduced due to soreness of genitalia or disruption of breeding behavior, like gadding.

Secondary Production Losses: Secondary production losses may be incurred due to parasite control efforts themselves. Examples include chemical stress due to toxic reactions to harsh pesticides, stress created by roundups for treatment, and reluctance to use forced-use treatment technologies that may interfere with normal intakes of water and feed.

Major Arthropod Pests

The horn, face, stable, and house fly may all be important pests of cattle under different conditions. Both the horn and face fly breed in fresh cow manure. Stable and house flies breed in decaying organic matter around livestock facilities. In general, house flies are pests of feedlot cattle.

The horn fly life cycle from egg to adult may be as rapid as 10 days in the summer. The face fly usually takes 3 weeks or more to complete its life cycle. The house flies' life cycle may be as rapid as 2 weeks; the stable fly takes about 3 weeks.

The nonfly pests of cattle include cattle lice, cattle grubs, ticks, and scabies mites.

Horn Flies

The horn fly is an obligate blood sucking parasite. Both sexes spend almost all of their time on the cattle. Horn flies may breed continually in the southern areas, but in the northern areas, they overwinter in the pupal stage under manure patties. Adults emerge from the pupal stage in early spring, and as the weather warms up, increase to the point that several thousand may be on one animal. Few horn flies are seen on spring calves unless large populations are present on cows, and even then, most horn flies select mature animals.

Cattle bothered by horn flies bunch, seek water or shade to stand in, and generally fail to graze normally. Experience indicates that bunching starts when fly populations reach about 150 per animal. Steer and heifer weight gain studies show differences of 10 to 20 pounds per animal in a summer between treated and untreated cattle. Depressed weaning weight on calves is an indirect effect of horn flies on cows. Studies also have shown a reduction of milk as a result of biting flies.

Several methods for horn fly control are currently used. For the last several years, the "slow release" ear tag has been the most popular with producers. When ear tags were first used, they totally eliminated flies from treated animals. The ear tags gradually released low levels of insecticide (primarily synthetic pyrethroids) over about a 5-month period. This constant low level exposure resulted in the rapid development of resistance, especially in the southern U.S. where several generations per year occur.

The market for products that afford good horn fly control is extremely large. Companies are constantly striving to develop new and better products to introduce to the marketplace. In the next few years, we will see a continual increase in the number and kinds of products available for control.

Even though they have not been used as much in the last few years, some of the early methods such as dust bags and oilers are still effective and should be included in fly control strategies. With any self-treatment device, proper placement and management are vital. Other methods of control include feed additives, sprays, dusts, and mechanical trapping.

Face Flies

The face fly is not a blood sucker, but feeds on various animal secretions. Tears, saliva, nasal mucus, blood, and serum exuding from wounds, perspiration, and filth adhering to the hair are all attractive to the face fly for feeding. The persistence and annoying congregation about the eyes of livestock cause cattle to take the same protective or fly evasive actions as they do for the horn fly. The face fly is a factor in pinkeye probably from the standpoint of eye irritation as well as transmission.

The face fly is more restrictive in habitat than the horn fly. It is most prevalent along waterways, areas of 30 inches or more rainfall, hilly ranges that have trees in the valleys, and on irrigated pastures. The more open sparse vegetation of the open range apparently allows the manure to dry out before the fly can complete its life cycle.

The overwintering habit of the face fly differs from the horn fly in that it overwinters as an adult in farm buildings including houses and probably in trees, holes in the ground, and other protected areas. As the weather warms up in the spring, the flies leave the sheltered area and return to the cattle.

All of the methods discussed for horn fly control can be used for face fly control but with less success. The habit of the fly congregating about the face of the animal means that an insecticide must get on the face to be effective. Face flies are at least equally attracted to calves as they are cows, which means that whatever fly control method is used must be used on both cows and calves.

If oilers or dust bags are used they should hang low enough so that the faces of the animals touch them, and so that the calves also get treated. This may have to be done gradually in order to get the cattle used to them. It is mandatory to force use of dust bags or rubbers for good face fly control. If the other methods are used, the animals almost have to be treated daily because the

flies spend a good percent of their time away from the animals, and the insecticides available for use on animals do not have a long residual effect.

Stable Flies

The stable fly is a blood sucking fly like the horn fly only larger. It breeds in decaying organic material. In a feedlot or wintering lots spilled feed mixed with dirt and manure become ideal stable fly breeding areas if there is enough rain to set the material. If cattle use the lots for water, flies attack them and may return to the pastures with the cattle. The stable fly may also breed in wet organic matter around lakes and ponds and bother cattle being pastured near the breeding areas.

Control of the stable fly on beef cattle is difficult. The lots should be cleaned to prevent fly breeding. Animal sprays will not be effective very long because the stable fly feeds primarily on the front legs and wet vegetation or water soon washes the spray off. Dust bags and oilers would also be ineffective because of the flies feeding on the legs that would not get treated with these devices.

Mist blowers or foggers can be used to spray knock down insecticides to the animal lots in the same manner as used in feedlots. The spray should be concentrated in the fly resting areas. The stable fly rests on shady surfaces around barns, bunks, tanks, or vegetation including trees in the vicinity of the cattle lots. Hydraulic sprayers could also be used; these sprays are applied only to the fly resting areas and have a period of maybe 1 or 2 weeks of fly killing activity. The flies land on the treated areas and absorb enough insecticide to kill the fly.

House Flies

The house fly has habits similar to the stable fly and the control measures would also be similar. The house fly rests on sunny surfaces and roosts at night inside of barns, usually on the ceiling, so these areas could be treated with residual sprays.

One additional control measure, baits, can also be used. These can be placed in places inaccessible to pets and children. The baits will work effectively for house flies. The use of parasitic insects (parasitoids) can also be used effectively when coupled with a good sanitation program.

Miscellaneous Flies

Black flies, mosquitoes, deer flies, and horse flies are also serious pests of livestock, especially when they are pastured near waterways that experience spring floods. All are extremely hard to combat. Dust bags, oilers, ear tags, and the animal sprays help to some extent. Aerial spraying of waterways in the spring when these pests are present is of some benefit. The waterways can be sprayed with a mist blower if one is available. Mosquito breeding waters that are impounded can be treated with insecticides or petroleum products, or if feasible, these areas can be drained.

Cattle Lice

Cattle lice may be the most underrated of the livestock insects. Heavily infested animals are usually in poor physical condition with rough, patchy hair coats that have a greasy, dirty appearance. Calves, yearlings, and older undernourished cattle usually have the heaviest infestations. These latter may be "chronics" or "carriers" that reinfest a herd every winter.

Lice are spread by contact from "chronics" to clean cows and from cows to calves. Anemia, anemic abortion, and death may occur as a result of heavy populations of lice.

The U.S. has four different species of blood sucking cattle lice and one species that feeds on sloughing skin. The life cycle of all is similar. They are host specific and spend all their life on cattle. Eggs are glued to the hairs of cattle. The immature lice have the same feeding habits as the adults. Populations of lice usually decline dramatically in the hot summer months but begin increasing again in the fall and into the winter months.

Control of cattle lice can be achieved on most animals with relative ease since the lice are on the animals all of the time. Spraying or dipping are standard methods for control of cattle lice. The use of systemic insecticides for control of the cattle grub aids in the control of cattle lice. Ear tags will often reduce louse numbers.

Spraying or dipping have the drawbacks of causing cold stress if cattle need to be treated during cold weather. Cattle should be treated on a day that they can become dry by sundown.

Heavily infested cattle should be examined after 2 weeks to determine if a second treatment is necessary. Lice eggs may escape mortality, and 14 days allows time for the viable eggs to hatch.

Dust bags and oilers will also control lice, but they take some time to effectively reduce a high louse population. They are used by many operators as a preventative rather than control measure and in this capacity seem to prevent population buildups. Several pourons and spotons are also effective for lice control.

Cattle Grubs

Possibly two species of cattle grubs are present in the northern U.S.—the northern and the common (southern) grub. Their life cycles are similar except the northern occurs later in the year.

The adult grub is a heel fly that causes cattle to "gad" in the spring when the heel flies are attempting to lay eggs on the hairs of cattle (usually on the hind legs on the underside of the animals). Yearling calves or young cattle seem to be preferred by the heel flies.

The common heel fly bothers cattle in late spring or early summer. The northern heel fly may be active even in late August or early September.

The young grubs hatch from the eggs glued to the hair of cattle and bore into the skin at the hair follicle. The

grub spends several months as an internal parasite then migrates to the back. The grub encysts in the loin area and cuts a breathing hole. When the larval development is complete, the grub leaves the animal through the air hole. It falls to the ground where it pupates. Within a month or two the adult heel fly emerges and after mating, the female heel flies lay eggs on the cattle.

The ideal time for grub treatment is soon after heel fly activity stops. Treatment should be done when spring calves are weaned in the fall.

Many of the treatment methods have been mentioned in the discussion of cattle lice. Systemic insecticides can be applied in the formulation of sprays, dips, pourons, and injections. If sprays are used, it is necessary to apply with high pressure (300 psi) in order to thoroughly wet the animal to the skin.

The insecticide in a dipping vat should be well agitated before use because it may have settled out. It is usually necessary to add insecticide after a certain number of animals have used a vat. Label directions will give instructions for this procedure.

Pourons requiring water as a dilutant should be mixed carefully as directed on the label. Water temperature is critical for some mixtures.

Scabies Mites

The *Psoroptes ovis* mite is small, less than 1/40-inch long, but it causes a great deal of irritation to the animal. It is detrimental to weight gains, milk production, and feed conversion. Scabies mites are fairly active on the animal; they are not burrowing mites like the sarcoptic mite or the demodectic mite. They feed and mate on the animal. The life cycle is about 10 to 12 days. Scabies mites spread easily by contact.

When scabies infestation first starts showing up on an animal, it may look much like an infestation of lice. Small patches of hair will be gone; the animal will start licking or rubbing. These areas gradually spread and soon may become lesions, showing the elephant-hide appearance, loss of hair, and heavy crusting. Oftentimes, the animals will injure themselves. One of the key factors is the constant irritation with that animal licking and rubbing, trying to relieve the itching.

Animals with scabies do all kinds of contortions trying to relieve the itching. Fat cattle will lay on the ground and rub. Younger cattle will scratch and rub on everything around, almost pushing the fences down.

Scabies has no respect for breed or size of animal. It was originally thought to be a cold season pest, but it has been found that hair length probably has more to do with scabies infestations than temperatures. A severe scabies infestation may occur in mid-July if those animals are restricted from grooming themselves.

Animal grooming is probably responsible for 80 percent or more control of Psorptic mites. The mites will gradually spread over the entire body and may not actually kill the animal, but will pre-dispose that animal to respiratory problems and ultimately death, if left uncontrolled.

Scabies mites can attach to any part of the animal's body, from the tip of the nose to the tip of the tail. Some animals become almost completely denuded of hair because of the heavy scabies infestations. Many times the animals injure themselves causing bad abscesses, bruises, and cuts trying to relieve the itching. Some animals will lick until the hide is raw and blood running down their legs.

Scabies mites are spread by contact, either direct or indirect. They can be controlled with the limited products that are currently on the market and approved. These products need to be used at the label rates, and the label must be followed carefully in order to obtain control.

Animals will start showing lesions that rapidly spread over the body within 24 hours. Scab formation is so heavy that oftentimes the thickness of the hide is nearly double on an animal that has a severe scabies infestation.

The best way to determine if you have scabies mites is to take a scrapping in an ointment tin or some other container, and send it to a diagnostic lab.

Scabies can be a severe damaging pest and is one that does not generally kill the animal. A heavy scabies infestation tremendously affects the white blood cell count of the animal, eventually affecting the bone marrow and ultimately may create respiratory problems and eventually death.

Because of severe scabies infestations animals may starve standing in front of a full feed trough with feed consumption dropping by over 50 percent.

You should call federal authorities of you have a scabies infestation. Because of the potential for rapid spread, it is a reportable, quarantinable disease that can be detrimental to public animal health if not identified and treated.

Other mites, such as the sarcoptic, chorioptic, and demodectic mites occur from time to time. These are not nearly the economic problems that we see with the Psoroptic mites. Infestations spread by physical contact, secondary contact, which can include loading chutes, fences, ropes, hot shots, etc.

The life cycle is as follows: the eggs hatch in about 3 to 5 days; the larval stage takes 2 to 3 days; the nymphal stage, which is the nonsexual form of the adult, 3 to 5 days; and then the sexually mature adult is ready to mate and start laying eggs for 1 or 2 days. Each female will lay between 15 and 24 eggs, and the eggs will hatch in 10 to 14 days. This is the reason for the two treatments with two of the products approved for scabies control on a 10- to 14-day interval.

The symptoms, are constant tail switching, licking, and loss of appetite. Small papules or little knots may appear on the withers, with visible lesions and hair loss. Ultimately, the animal will experience weight loss, re-

duced milk production, and oftentimes reduced weight gains. Also, the animal will become more susceptible to other diseases and, if left uncontrolled, death will be the ultimate result.

Ticks

Ticks may be present on animals brought into this area anytime of the year. If ticks are observed on incoming animals, they may be controlled by spraying or dipping with an approved insecticide. Self-treatment devices are not as effective for tick control as they are for horn flies and lice.

Although winter ticks are occasionally observed, ear ticks are the only "native" tick problem causing major concern in a semiarid climate. The ear tick may cause a condition known as canker ear and will cause animals to become dull and unthrifty.

If heavy infestations are observed, they can best be controlled by directly applying approved insecticides into the animal's ear. This can be accomplished with a spring bottom oiler, puffer duster, or other such device. Sprays and dips are not as effective as the individual ear treatment method.

Problem Analysis

Numerous labelled products are on the market to aid in the control of the many arthropod pests that have been discussed. Some of the products are also effective against some of the internal parasites.

Producers often are aware of the pests that attack their animals but fail to consider how much these pests may be affecting the profit/loss situation. In this time of severe economic problems in agriculture, all management factors must be evaluated and decisions made based on accurate analysis.

If you do not have an economic problem with a pest, usually it is advantageous to not treat for it. With some of the pests, it may be financially beneficial to use preventative treatments. When the decision has been made to treat, then a careful analysis of the various treatment methods and costs need to be made. Because your neighbor used a product does not mean that it is right for your ranching operation.

After the product is selected for treatment, a thorough understanding of the label is necessary for proper safety and use. The label must be read and the proper treatment procedures followed. Pesticides must be used properly to ensure that the animals, and applicator, non-target animals, and the environment are not affected.

Proper safety and use of pesticides is a must. Cattle producers are under close observation by numerous groups that would like to see cattlemen put out of business. It is mandatory that label directions are read and followed, and that cattle producers consider the environment before doing any type of control procedure. Good practice is to acquire a past management attitude and try to use management techniques in the total operation.

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