Fall and Winter Pests of Livestock

Kelly M. Loftin

With this being the last issue of Pest Management News for 2022, I thought it would be worth mentioning potential pests concerns that could become a problem before our newsletter resumes next spring. A little bit of knowledge and planning now can prevent pest problems that we may face in the upcoming winter and spring. In full disclosure, the information below was previously published in our October 2020 Pest Management News.

Fall Treatment for Horse Bots

Killing frosts signals the best time to treat our horses for bots and some regions of the state have received at least one killing frost. Even those that diligently remove bot eggs throughout the summer and fall should treat their horses and mules for horse bots. Although the adults are free living and do no direct harm to horses, their immature stages (larvae) can cause damage to the stomach lining which can lead to major health issues including colic.

Horse Bot Flies (Family Gasterophilidae). Horse bot flies are in the family Gasterophilidae. The larval forms are important internal parasites of equines. The three species considered important in the U.S. are: *Gasterophilus intestinalis* (DeGeer), the horse bot fly; *Gasterophilus nasalis* (L.), the throat bot; and *Gasterophilus haemorrhoidalis* (L.), the nose bot. Adults resemble bees in that they are about the same size and hairy-bodied (Figure 1). Adult bot flies are short-lived, possess non-functional mouthparts thus do not feed. Adult activity begins in warm weather and ceases at the first frost.

Adult female bot flies attach eggs to the hairs of the host's body similar to lice (Figure 2). The site of egg attachment is specific to the bot fly species. Horse bot flies attach eggs on the forelegs between the knee and hock; throat bot flies attach eggs under the jaw; and the nose bot flies attach eggs to the upper lip. Horse and throat bot fly eggs are stalkless; and nose bot fly eggs are stalked. For the horse bot fly, egg hatching is stimulated by moisture and friction from the animal's licking. Larvae gain access to the host's mouth by this licking, and burrow into the tongue or gums. They remain there for about a month then pass to the stomach attaching to its mucous membrane where they remain for about 9 months (Figure 3). In the spring larvae (Figure 4) detach from the stomach and are passed with feces and pupate (Figure 5) outside their host. Adults emerge from pupae in about a month to 6 weeks. Horse bot flies may cause significant damage to the stomach lining and possibly stomach rupture or colic if the passageway between the stomach and small intestine becomes blocked. The life cycle of the throat and nose bot flies are similar to the horse bot fly, except mature nose bot fly larvae attach to the rectum near the anus; and the mature throat bot fly larvae attach in the duodenum (first section of small intestine) near the pylorus.

Chemical control of bot flies is aimed at the parasitic stage within the horse. Avermectin formulations containing products such as ivermectin or moxidectin are available for bot fly control in equines. These products are relatively easy to use, fall treatments should be administered after fly activity ceases (generally after the second killing frost). The "Insecticide Recommendations for Arkansas - 2022" (MP 144

http://www.uaex.uada.edu/Other_Areas/publications/PDF/MP144/MP-144.asp) provides a listing of products available for controlling bots in equines. “Arthropod Pests of Equines” (MP 484 https://www.uaex.uada.edu/publications/PDF/MP484.pdf) provides biology and control information on major arthropod pests of equines including horse bots. “Livestock Health Series: Internal Parasites of the Horse” (FSA 3096 https://www.uaex.uada.edu/publications/pdf/FSA-3096.pdf) is available for more information on other internal parasites of equines including bots.

Non-chemical bot fly control is aimed at the eggs. Equine owners can frequently sponge the horse with warm water or to stimulate hatching of bot fly eggs. New hatched bot fly larvae quickly die especially if done on a cool day. For the horse bot fly, concentrate efforts on the animal’s legs between the hock and knee. Also, applying insecticidal washes to egg laying sites can reduce the number of larvae ingested by the animal. Bot combs or pumice bot stones can also be used to scrape away the eggs. These remedies should reduce the number of bot fly larvae ingested by the animal, but will not control any larvae that were unaffected and ingested. Because of the seriousness of bot fly infestations, treatment with a boticide to control the parasitic stages is recommended.

Very rarely, horse bots fly can cause ocular myiasis in humans. Ocular myiasis is an invasion of the eye by first stage larvae. These cases are rare and can occur in individuals handling horses that have bot fly eggs on their hair. On these rare occasions, bot fly larvae will enter the eye possibly as a result of rubbing their eyes. In other rare instances, hatched larvae enter the human skin causing cutaneous myiasis which can result in visible, inflamed tracks, irritation and itching from the larva’s burrowing. People working with horses during bot fly season should not rub eyes after combing or washing animals and thoroughly wash their hands.

Figure 1. Adult horse bot fly, *Gasterophilus intestinalis* (DeGeer). *(Kelly M. Loftin)*

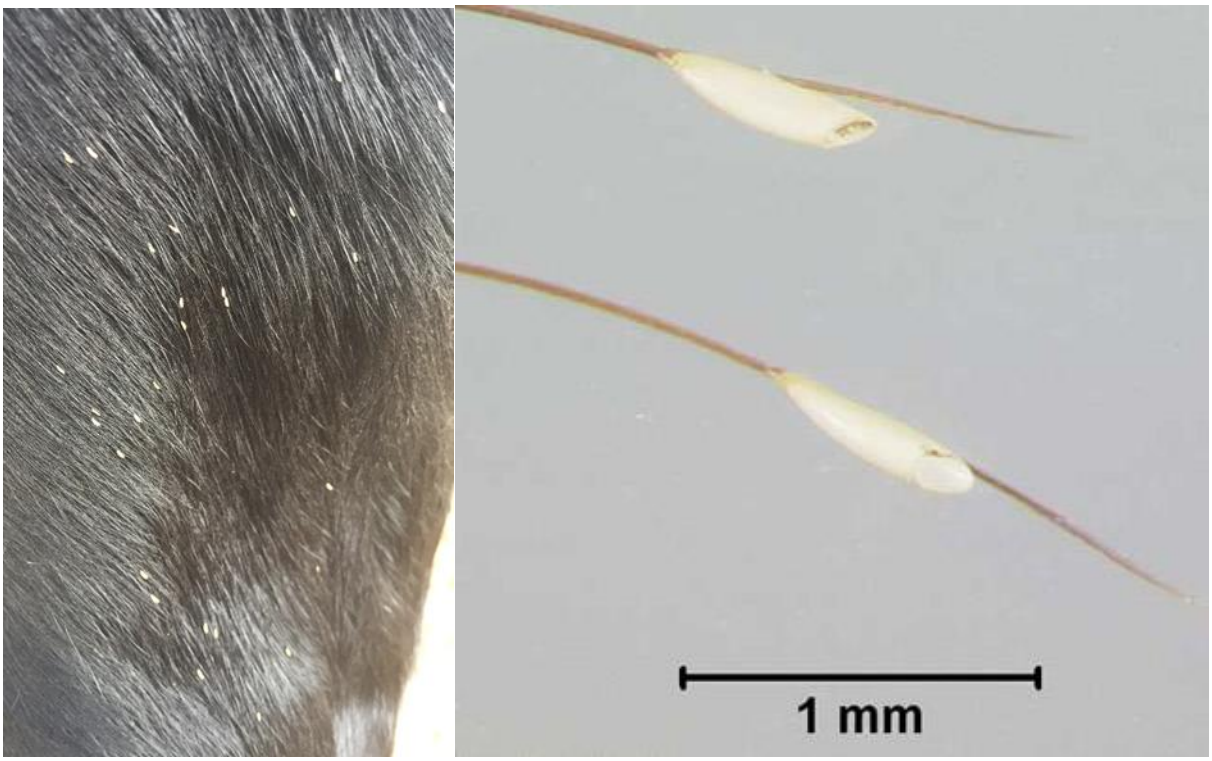

Figure 2 a. & b. Eggs of the bot fly, *Gasterophilus intestinalis* (DeGeer), deposited on the hairs of a horse's foreleg. *(a. Kelly M. Loftin* b. University of Florida*)*

Figure 3. Bot fly larvae, *Gasterophilus nasalis* (L.), attached to the pyloric region of horse stomachs. *(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)*

Figure 4. Bot fly larva, *Gasterophilus intestinalis* (DeGeer). *(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)*

Figure 5. Pupa of bot fly, *Gasterophilus nasalis* (L.) *(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)*

Lice

Cattle, goat, sheep and horse owners need to at least think about lice on their livestock this winter. In many cases, the potential for severe direct economic losses in cattle caused by biting or sucking lice is fairly low. However, heavy infestations add to the stress of cold weather, shipping, poor nutrition and internal parasite load. Lice are generally most abundant on animals during the period of greatest winter stress and continue through early spring.

Why are lice a winter pest? Generally, lice do not survive well in the summer because hot temperatures are lethal to the insect. However, a small percentage of animals may serve as chronically infested "reservoir" animals. A few lice on the reservoir animals survive on cooler areas of the body such as the ear tips. As temperatures cool, louse abundance increase resulting in the movement onto louse-free animals. Crowed conditions that often occur at winter feed troughs exasperate this spread.

Lice are small (1⁄10 to 1⁄8 inch), wingless, species-specific external parasites of livestock and poultry. Two species occasionally infest equines: the horse sucking louse (*Haematopinus asini)* (Figure 1) and the horse biting louse (*Bovicola equi)* (Figure 2). In cattle, one species of biting lice, the cattle biting louse (*Bovicola bovis*) and three species of sucking lice; the shortnosed cattle louse (*Haematopinus eurysternus*), the longnosed cattle louse (*Linognathus vitula*), cattle tail louse (*Haematopinus quadriptusus*) and the little blue cattle louse (*Solenoptes capillatus*) occur. Sucking lice pierce the skin and suck blood while the biting lice move about on the animal chewing hairs, skin and secretions. Both types of lice are problems during the winter and early

spring but as mentioned earlier reproduce year-round at least on some animals. Lice are spread from animal to animal by direct contact such as shipping or feeding. Animals infested with lice will have an unkempt coat, scaly skin and possibly raw areas on the skin. Infested animals will scratch and rub to relieve the itching caused by lice. Often in heavy infestations, clumps of hair will fall off. Weight loss or reduced weight gain can occur with heavy louse infestations.

Lice can produce multiple generations per year, thus allowing numbers to become high if uncontrolled. All louse stages (egg, nymph and adult) are found on the animal. Adult female lice glue eggs (called nits) to hairs (Figure 3), eggs hatch into nymphs in about 10 to 15 days, and after three molts, nymphs become adults. It requires about 1 month for an egg to develop into an adult.

In cattle, light louse infestations are easily overlooked. Heavier infestations are easier to recognize by animals' rubbing and loss of hair. A lice population on cattle can be estimated by examining five one inch square areas on the face, face, dewlap, neck, back and base of the tail. Lice populations on cattle are usually categorized as very slight (less than 5 per square inch), slight (5-10 per square inch), moderate (10-20 per square inch), severe (20-50 per square inch) and very severe (over 50 per square inch).

Louse infestations are identified more quickly in horses because they are routinely groomed. Horses infested with lice will have an unkempt coat, scaly skin and possibly raw areas on the skin. Infested animals will scratch and rub to relieve the itching caused by lice. Weight loss or reduced weight gain can occur with heavy louse infestations.

Good nutrition that includes a high energy diet usually reduces the negative effects of lice infestations on livestock and is the foundation of a louse control program. Sufficient nutrition will allow the animal to better deal with blood loss and irritation. Another very important component of lice prevention is to assume that all purchased or "new" animals are infested. With this said, new animals should be isolated from the rest of the herd until a full course of louse treatment is completed.

Insecticides used for louse control are divided into two major groups; systemic products (includes some synthetic organophosphate insecticides and endectocides) and non-systemic products (primarily pyrethroids). For winter treatment of lice on cattle, selection of the right insecticide is crucial. Winter applications of endectocides containing doramectin, ivermectin, moxidectin; and systemic organophosphate insecticides such as phosmet may trigger an adverse host-parasite reaction if cattle grub larvae are in a critical stage of migration in the cattle. When lice infestations are detected during the winter months in **cattle that were not previously treated for cattle grubs before Oct. 15**, non-systemic products containing permethrin/diflubenzuron, cyfluthrin, permethrin, zeta-cypermethrin, gamma-cyhalothrin, and lambda-cyhalothrin are recommended. Also remember that products registered for use on beef cattle may or may not be approved for use on lactating dairy cattle so consult the label before purchase. In horses, synthetic pyrethroids such as permethrin and organophosphate insecticides such as coumaphos may be used to control louse infestations.). Consult the animal section of the "Insecticide Recommendations for Arkansas - 2022" (MP 144

https://www.uaex.uada.edu/publications/MP-144.aspx) for a listing of insecticides available for louse control.

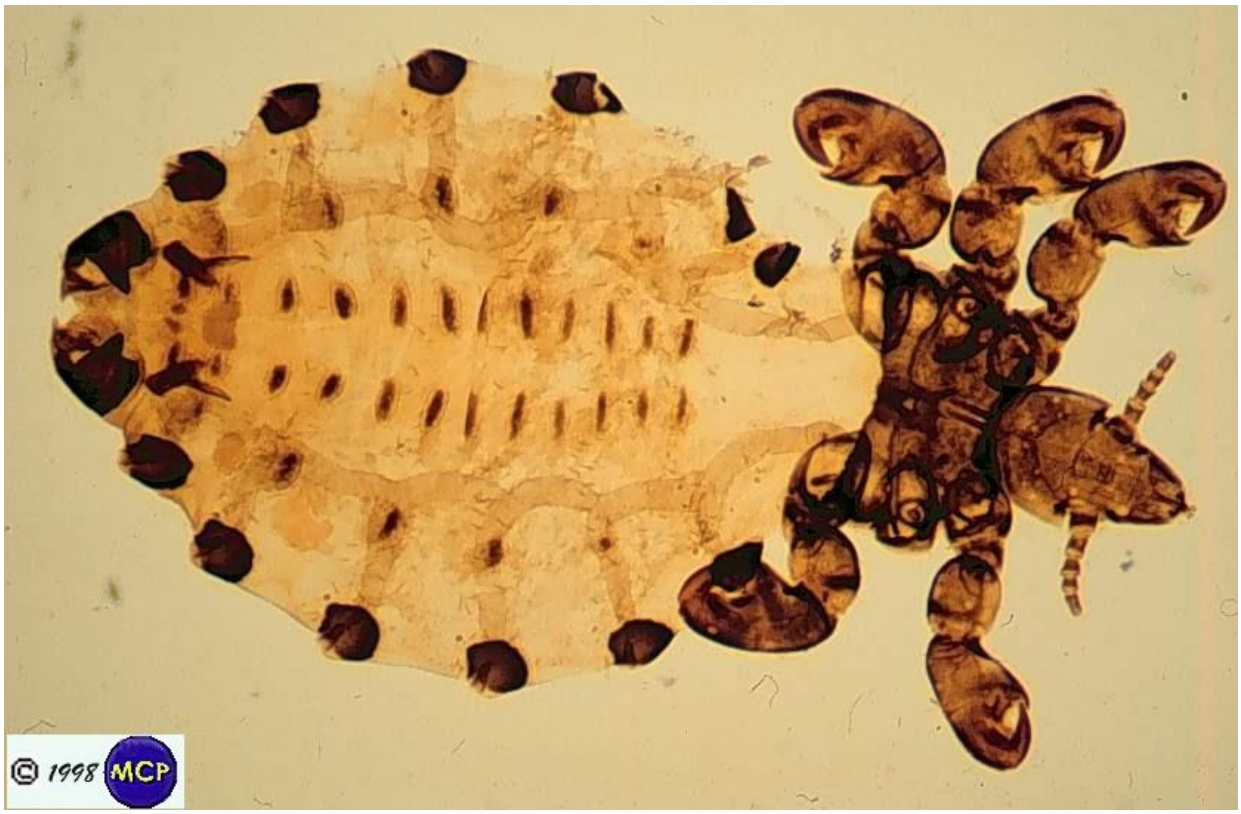

Figure 1. Sucking louse, *Haematopinus sp.* *(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)*

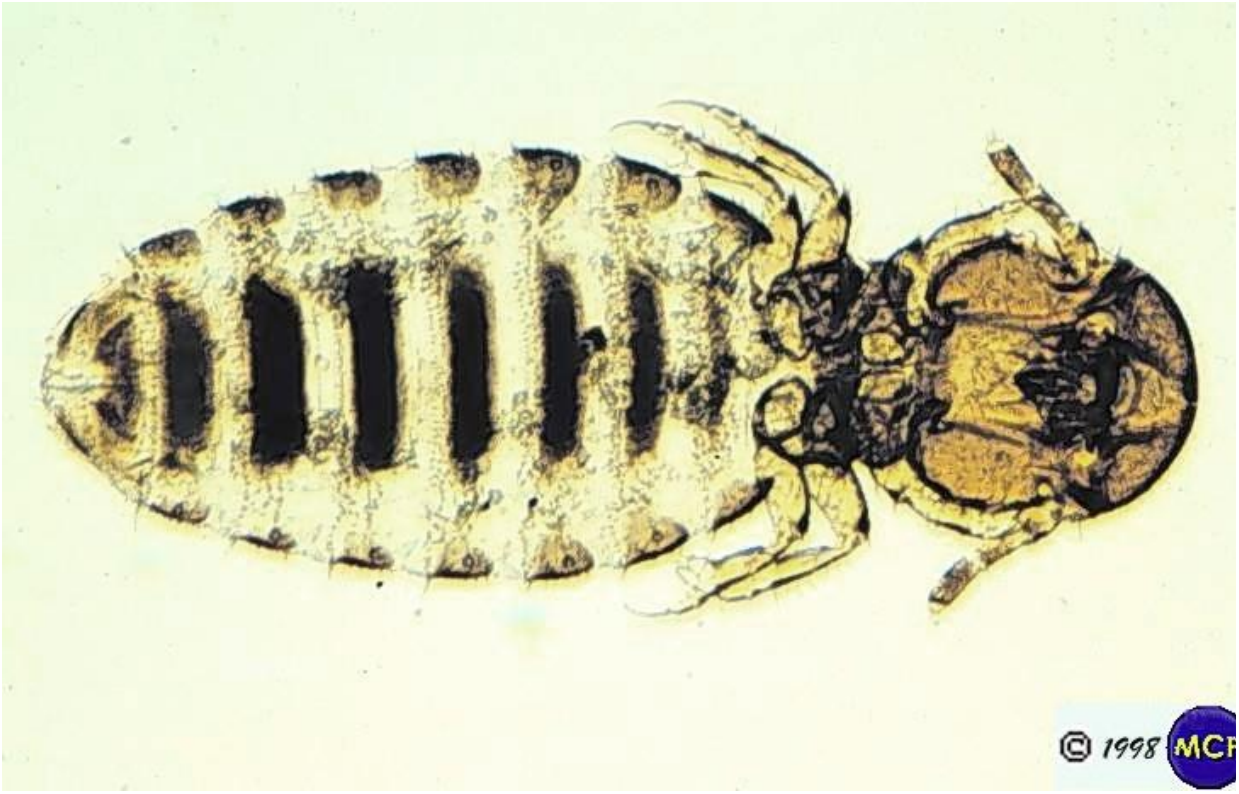

Figure 2. Horse Biting Louse, *Bovicola equi* (Denny). *(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)*

Figure 3. Louse eggs (nits) attached to horse hairs. ***(Marcelo de Campos Pereira, http://www.icb.usp.br/~marcelcp/)***

Minimize Hay Wastage

With winter just around the corner, we need to remember to minimize hay wastage now to prevent stable fly problems next year. Moisture, rotting hay, livestock manure and warm temperatures are the ingredients necessary for a damaging stable fly population. All these ingredients come together in areas where hay was wasted.

Practices to avoid a buildup of stable fly breeding material.

1. Modify hay feeding techniques to prevent a stable fly problem.
    a. Unroll hay (in large round bales) in a different location for each feeding.
    b. Distribute "flakes" of small hay bales in different locations in the pasture
    c. Feed hay only in well drained areas.
    d. Do not feed more than the animals will clean up during a single feeding.
2. Clean up wasted hay around hay rings before stable flies become a problem.
3. If you cannot clean up around a hay ring, run a farm implement (disk, etc.) through the area. This will kill some stable fly larvae and pupae and dry out the breeding material to inhibit larval development.

A typical stable fly breeding site – hay ring feeder. (University of Missouri Extension Service).