Protecting Horses from Horse and Deer Fly Bites

Horse and deer flies are large biting flies that are annoying pests of horses, cattle, humans, and wildlife. Horse and deer flies have many regional names, including yellow flies, green-head flies, gad flies, stouts, dun flies, moose flies, whame flies, buffalo flies, and elephant flies. Adult female flies feed on blood and can transmit pathogens, including those that cause equine infectious anemia (Foil et al. 1983) and tularemia (Klock et al. 1973, Petersen et al. 2009).

Biology
Horse flies are large flies that generally belong to the genera *Tabanus* or *Hybomitra*, whereas deer flies are smaller flies that mostly belong to the genus *Chrysops* (Figure 1). In some areas of the country, these flies are collectively called “Tabanids.” Both groups are stout-bodied flies with varying patterns and large eyes that often are brightly colored. Their large eyes allow them to distinguish movement and shapes that contrast against the background. Dark-colored animals provide the flies with a clearer-contrasting visual target and can attract more flies than light-colored horses in pastures.

Horse flies and deer flies have specialized mouthparts that cut the skin to produce a pool of blood. They are strong fliers and aggressively try to bite. Females will lay eggs on vegetation adjacent to wet habitats like marshes, streams, or ponds. Larvae develop in the mud in these areas.
Veterinary Concerns

Horse and deer flies are a nuisance that can upset horses and horse caretakers, although bites may cause raised welts and blood spots (Figure 2). The loud flying sounds and bites can cause horses to mount defensive behaviors like biting at their sides, stomping, kicking, swishing their tails, bucking, and running. Evasive behaviors like fence walking or running can increase when horses are pressured with flies. These behaviors can compromise your horse's health when done excessively. For example, excessive stomping can lead to hoof damage and potential lameness.

Horse and deer flies can also transmit the virus that causes equine infectious anemia (EIA; Foil et al. 1983). When flies feed on horses infected with EIA, the virus can travel on the mouthparts of the fly to an uninfected horse, transmitting the virus. Tularemia has also been reported to be transmitted by horse and deer flies (Klock et al. 1973, Petersen et al. 2009).

Control

Control of horse and deer flies can be challenging. Horse and deer flies develop in water and are strong fliers, and habitat modification in these environmentally sensitive areas is difficult. Therefore, control is usually focused on intercepting adult flight or protective measures for horses against adult bites.

Turnout and Pasture Management

Horse and deer flies are active around wooded areas, especially if there is some form of water nearby. These flies are active in the sun and avoid areas of shade. Run-in shelters or large canopy trees located away from wooded edges can give horses refuge from the flies (Raymond and Rousseau 1987; Figure 3). If pasture space can be increased, this will allow horses to naturally move away from biting-fly pressure. Some species of horse and deer flies are territorial. Their range may include only one pasture or portion of a pasture, and sometimes bites can be avoided by turning horses out in another pasture away from horse and deer fly activity. Turning horses out at night instead of the day can reduce biting because horse and deer flies are daytime biters.

Trapping

Horse and deer flies use their vision to locate their hosts. Current commercially available horse and deer fly traps use the vision of these flies to maximize attraction and trapping (Wall and Doane 1980, Watson et al. 2007, Kline et al. 2018; Figure 4). Three types of traps are available for horse and deer flies:

1. the Horse Pal® trap and the Bite-lite® H-Trap, which use a suspended black ball, (2) the Epps Biting Fly Trap®, which uses a large, dark-colored sheet, and (3) box traps that are stationary, dark-colored areas.

The Horse Pal® trap uses a suspended black ball to mimic an animal. The ball is covered with a canopy that encourages the natural upward flight of flies attracted to the swaying ball. Flies are trapped in a clear jar at the top of the canopy. The principle is similar for the Bite-Lite® H-Trap. The Horse Pal® trap has four legs, while the Bite-Lite® H-Trap is a single post.

The Epps Biting Fly Trap® uses a large, dark-colored tarp that may resemble a large animal. Instead of trapping flies, the Epps Biting Fly Trap® deflects flies that land on the panels into trays of soapy water, where they will drown. This trap requires regular maintenance to remove flies from the trays often so that new captures cannot use previously caught flies to escape.

Box traps have an open bottom mounted on four legs. The top of the box is covered with screening. Flies enter the underside of the box and are channeled upward by screens to the upper part of the box, where they die. A commercial box trap, the FlyCatch-R®, is available. These traps are typically used for horse and deer fly capture in salt marsh areas.

The most important component of trapping horse and deer flies is trap placement. Horses and other animals should not be
able to interfere with traps. However, traps should be placed where flies are a problem. These traps are especially useful in areas where horses cannot escape bites, such as in small pastures or near riding arenas. Traps should be in sunny areas where they can be seen from the woods or marshy areas, and away from buildings or other obstructions that might interfere with fly vision. Sometimes effective placement requires a bit of trial and error. If traps are not successful initially, moving them just a few yards can increase trap captures. It is estimated that a trap can cover about 2 acres if properly placed.

Other traps for nuisance flies, such as jug traps, scatter baits, and other visual targets like Bite-Free™ sticky traps for stable flies, will not be effective for horse and deer fly control.

On-Horse Fly Protection
Fly sheets, boots, and masks are barriers that protect horses from multiple species of biting flies like stable flies, horn flies, and horse and deer flies. While there are several options available to individualize fit and comfort, zebra patterns in particular decrease fly attacks because of how horse and deer flies perceive color (Caro et al. 2019; Figure 5).

Fly Repellents
Full-body application of repellent products with synthetic pyrethroids seems to be effective. Horse and deer flies will bite any area of the body, so it is important to have full-coverage application. Better coverage can be achieved by applying repellent to a brush or microfiber mitt (or similar) and then applying to the horse (Figure 6). While likely to be deterred from landing on a horse, horse and deer flies may still repeatedly fly around a horse even after application and land on the legs or belly areas as the repellent loses effectiveness. Frequent reapplication is likely necessary (at least daily, or before riding in areas where horse and deer flies are present).
Conclusion

Horse and deer flies are both a nuisance and a vector for serious equine diseases. Control of these flies is more difficult than stable flies or other pest flies. Altering turnout and pasture management may help, and traps have been shown to be effective. Fly sheets and fly sprays can be used to help reduce bites.

Resources

- Bite-Lite H-Trap®
  https://www.bite-lite.com/
- Epps Biting Fly Trap®
  Multiple commercial sources
- FlyCatch-R®
  https://www.flycatch-r.com/
- Horse Pal®
  http://www.bitingflies.com/

References


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