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EXTENSION

Fly Control Around Horses

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Horse Program

Providing research-based information to Minnesota Horse Owners

Flies are a natural part of keeping horses. Two main groups of flies are a concern in Minnesota, filth flies and aquatic biting flies. Understanding what these pests are and how they live and breed can help horse owners limit their fly pest problems.

Filth Flies (Stable fly and House Fly)

These flies are called filth flies because they develop in moist organic debris such as aging feces, soiled animal bedding, and rotting feed debris. Stable fly adults (Figure 1) have seven black spots on a gray abdomen, and their heads have hardened, bayonette-like mouth parts that penetrate the skin to take in a blood meal. Biting stable flies cause horses and other livestock to switch their tails, twitch their flanks, and stamp their feet (Figure 2). Of all adult stable flies around horses, only 5% will be on the animal at any one time; the other 95% will be perched on nearby fencing, buildings, and vegetation.

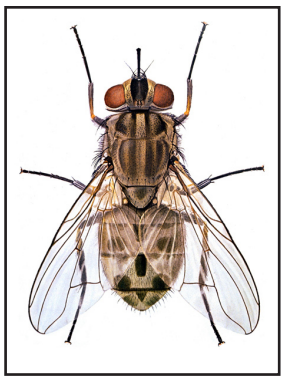

Figure 1. Stable fly adult

Figure 2. Horse switching tail

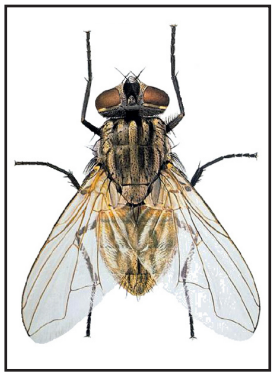

Figure 3. House fly adult

House flies (Figure 3), on the other hand, do not bite animals, but can be a nuisance to people around animals, and can spread fecal bacteria. House flies have fleshy, sponging mouth parts that suck up fluids. House flies will feed at horses' eyes, body orifices, and fresh manure. Like stable flies, only a small percentage of house flies are on a horse at any one time.

Biology of filth flies.

In Minnesota, filth flies reproduce continuously from May into October. Adult females lay 50-150 eggs every few days. Females place eggs in moist organic debris such as manure, rotting hay and soiled stall bedding. Small maggots hatch from eggs and feed on bacteria growing in the debris.

Mature maggots are 1/4 to 1/2 inch long, have heads that taper to a point, and rounded abdomens with two dark spiracles used for breathing. Ideal conditions for maggots are in debris that is 40-80% moisture and 70-95°F.

Figure 4. Stable fly maggot, side view (left), and hind view (right)

Likely sources of debris around horse barns are muck near leaky waterers, old hay around feeders, piled manure, and soiled bedding. Maggots mature into pupae and then into winged adults. The entire life cycle can be completed

in as little as two weeks, and adults can live one to three weeks, depending on weather.

When not feeding, stable flies and house flies 'perch' on solid substrates, often above head height, where the flies can sit undisturbed. Perching sites are easily identified by accumulations of fly specks, which are small brown spots of fly waste. Knowledge of perching sites can help guide applications of residual insecticides intended to kill the adult flies.

Source reduction for filth fly control

Filth flies in and around barns can be controlled through debris management, which should be guided by weekly scouting for potential maggot breeding sites. In the long term, preventive debris management will be more effective than chemical controls (Table 1).

Table 1. Likely sources of filth flies around horses, and recommendations to prevent fly breeding.

Substrate	Recommendations
Feed	Keep dry. Avoid ground feeding. Disk, spread or compost waste.
Manure	Clean-up at least two times per week. Spread or compost.
Stall bedding	Replace weekly. Wood shavings and sawdust produce fewer flies than straw.
Waterers	Place in well drained areas, and away from places where horses are fed. Keep in good repair.

Chemical and non-chemical control methods

Insecticides, fly traps, and stingless parasitic wasps can be used to augment debris management. Pyrethrum or resmethrin fogs and space sprays can be used to kill adult flies indoors, but relief will be temporary because these insecticides break down quickly. Pyrethrum contains pyrethrins that are extracted from certain cultivated chrysanthemums. Resmethrin is a synthetic pyrethrin. Longer lived pyrethroid and organophosphate residual premise

Figure 5. Fly specks and a stable fly on fence panel

sprays can be applied indoors and outdoors, and will be most effective if applied to fly perching areas. Residual premise sprays may be effective up to 3 weeks, depending on site dustiness. Neither fogs nor residual insecticides will be very effective without good debris management, because the flies have a high reproductive potential. For safety, users of chemical insecticides should always carefully read and precisely follow label instructions.

Three kinds of commercial fly traps are also available for purchase. Sticky traps and ultraviolet electrocutor traps will catch and kill stable flies and house flies. Baited traps will attract and kill house flies, but not stable flies. While fly traps of all kinds can catch impressive numbers of flies, efficacy will be limited if debris management is inadequate, or in outdoor environments if flies are immigrating from off-premise sources.

Stingless parasitic wasps are small, ant-like insects that kill filth fly pupae. These wasps occur naturally around animal premises, provide natural biological control of filth flies, and yet are harmless to people and animals. Wasp females search for fly pupae in fly breeding media. When encountered, females lay eggs inside fly pupae, and then the wasp larvae eat and kill the developing fly pupae. Horse owners can purchase and release parasitic wasps to supplement natural populations. Unfortunately, success has been inconsistent among different research studies, and probably depends on supply of fly breeding media and numbers of fly pupae that need to be killed.

Fly repellants can provide temporary relief from attacking stable flies. Effectiveness is likely to be limited to a few hours, but this may be enough to keep horses comfortable to show or ride safely. Active ingredients in effective products contain botanical pyrethrins, synergists, and synthetic permethrin and cypermethrin. These products should be applied to legs where stable flies are most likely to attack, and will need to be reapplied if the horse walks through wet vegetation.

Horse owners have probably heard of or tried natural remedies for control of filth flies. Recently, horse owners have hung plastic bags of water around buildings, with the belief that the bags repel house flies. While not harmful, there is no logic or evidence to support this practice. Recipes for stable fly and other biting fly repellents include water, vinegar, bath oil, mouthwash, plant oils, and herbal extracts. Some plant oils have been shown to repel mosquitoes under laboratory conditions, but synergized pyrethrins and permethrin are more effective and last much longer. Horse owners should know that none of the home recipes has been shown to protect outdoor horses from biting insects, and some of the ingredients may injure horses with sensitive skin. Products that are registered with the Environmental Protection Agency (EPA) have undergone extensive safety testing and products carry an EPA number on their label.

Horse owners also frequently inquire about using barn lime to control fliers. Hydrated lime or calcium hydroxide (commonly sold as barn line) is commonly used reduce moisture and can reduce ammonia odor in barn stalls. When use in large quantities, it can also increase soil pH. At amounts likely to be used in horse facilities (usually minimal amounts), it is unlikely to provide a benefit for fly control. Fly maggots are tolerant of wide ranges in pH. If you are using lime in a pasture, significant use of the lime may increase the pH enough to inhibit some plant growth.

Aquatic Biting flies- Black Flies, Horse flies, Deer Flies and Mosquitoes

Aquatic biting flies are the second group of bothersome flies around Minnesota horses. These flies are difficult to control because they develop in wetlands that can not be managed, as adults can travel several miles from their aquatic origins. Males and females feed on plant nectar, and females attack numerous species of animals to obtain blood and reproduce.

Black flies

These 1/16 inch long, gnat-like insects commonly attack horses housed outdoors from May into July in Minnesota (Figure 6). Black flies have cutting-sponging mouth parts that stab skin and cause blood to flow to the surface. Larvae develop only in flowing creeks, streams and rivers. Unfortunately, adults can travel several miles from their larval sources, so horses on premises without flowing water may still be attacked. During outbreak times, horses can develop scabby lesions from repeated biting, especially in their ears, or on their necks, chests and bellies. Black flies bite only during the day (not at night), and few will enter dark, shady areas.

Horse Flies and Deer Flies

These 1/3 to 1 inch long stout flies are active around swamps, where their larvae develop as predators eating other soft bodied animals in

Figure 6. A black fly

Figure 7. A horse fly

Figure 8. A deer fly

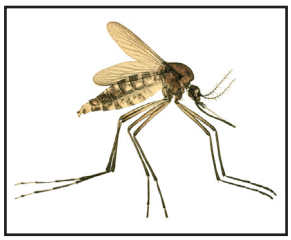

Figure 9. A mosquito

swamp mud (Figures 7 and 8). Adults tend to be concentrated nearby, but can travel several miles in search of hosts. Like black flies, horse flies and deer flies are only active in bright daylight.

Mosquitoes

These 1/8 to 1/4 inch long insects can reach annoying levels (Figure 9). More importantly, they are vectors (carriers) of three viruses that can be lethal to horses. The viruses are West Nile, western encephalitis, and eastern encephalitis. Above all, horse owners should consult with their veterinarians to vaccinate against these three viruses. For more information on vaccinations, see the University of Minnesota fact sheet on "Vaccination and Deworming" (publication #08540).

Most mosquito species are active from sundown into the night, but a few can be active during the daytime, too. Mosquito larvae grow in pockets of still water with decaying leaves and algae, including rain filled depressions, naturally occurring tree holes, permanent to semi-permanent swamps, and artificial containers such as water troughs, old tires, and other manmade containers.

Control of aquatic biting flies

Relief from black flies, horse flies and deer flies can be obtained through avoidance, by keeping horses indoors, if possible, during daylight hours or by allowing access to barns or other areas with deep shade. Scabby lesions from black fly bites can be salved with petroleum jelly to reduce further biting and help heal the lesions. Unfortunately, commercial repellents are not very effective against black flies, horse flies or deer flies.

Horses can be protected from mosquitoes by housing them indoors, or behind screened doorways and windows. On-site mosquito breeding should be prevented by cleaning water tanks and garden containers to remove leaves and algae. Dispose of old tires, drill drain holes in tire swings, and overturn or discard buckets and all other containers that could hold rain water for more than one week.

Several types of traps are marketed to control aquatic biting flies. Some models emit carbon dioxide, and others present colors and shapes that contrast with the surrounding environment. As with sticky traps used to control filth flies, aquatic biting fly traps are likely to kill only a small percentage of the flies that are actually present around horses. Use of traps has not been shown to reliably improve horse comfort or protect them from mosquito transmitted viruses.

Reviewers: Jeff Hahn, and Krishona Martinson, PhD, University of Minnesota Extension; Alec Gerry, University of California Riverside; and Phil Kauffman, University of Florida, Gainesville

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