What's eating your horse?
UNDERSTANDING THE BOT FLY

By Scott Schell

By July, you may be feeling good about your insect pest control program around the barnyard.

Hopefully, you are using a combination of sanitation, bio-control, repellents, and traps to control biting and filth flies. An Integrated Pest Management (IPM) system is an effective and environmentally sensitive approach to pest management that relies on a combination of these common-sense practices.

A different pest, bot flies (Order Diptera, Family Gasterophilidae) becomes a problem about this time of year. These parasites spend the majority of the year as larvae feeding on tissues inside the gastrointestinal tract of horses, mules, and donkeys.

Populations of bot flies in the United States have been reduced with widespread use of parasite control products that work well against both worm and insect internal parasites. This doesn't mean bot flies are in danger of extinction, as enough horses are left untreated each year to make them a potential annual problem.

Fertile Flies

Females can and do fly miles in search of hosts, and a single female can produce hundreds of eggs. One untreated horse can produce enough adult bots to parasitize many other horses over a wide area.

The bot fly's life history is fascinating and deserves explanation. Learning all facets of a pest's life is important for IPM. The tale starts with the adult, mated female bot fly depositing eggs on an unfortunate equine. The bot hovers and darts in and, with a long ovipositor, attaches the sticky egg to a hair shaft.

The three species of bot fly have major differences in the body region they prefer to oviposit on, but all end up in the mouth. The horse bot (*Gasterophilis intestinalis*) prefers to attach its cream-colored eggs to the front legs where they have to be stimulated to hatch by the horse biting or licking those areas.

The throat bot (*G. nasalis*) prefers the area under the jaws to attach its cream-colored eggs. These eggs hatch without the need for stimulation in five to six days, crawl to the lips, and burrow from there to the mucous membrane of the mouth.

The nose bot (*G. hemorrhoidalis*) attaches dark-colored eggs to the whiskers on the lips. These are ready to hatch after a few days, and the moisture from licking stimulates them to hatch.

The tiny larva of all three species spend about a month in the tissues of the mouth developing to the second larval stage where they can survive in the gastrointestinal tract.

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Bot fly eggs attached to hair shafts.

Prefer Three Locations

After the larvae are swallowed, they attach themselves to preferred locations. The horse bot chooses the uppermost portion of the stomach lining above the normal fluid level. The throat bot prefers the duodenum of the small intestine. The nose bot initially attaches to either location in the second and early third stage but, as a late third stage larva, this species earns it scientific name by traveling to the rectum and reattaching there before eventually exiting the equine.

The bots feed on the tissue and secretions of the horse and not the plant matter in the digestive tract. They all grow to be around 20 millimeters in length after several months in the digestive tract of the horse

That they can survive in an environment designed to breakdown and digest organic matter is remarkable. Starting in the spring, the mature larva release from the horse's body and travel with feces out to the ground. The larvae of all species burrow into the soil surface and pupate. The adult flies emerge three to nine weeks later. The bots mate, and the females begin the quest for hosts for the next generation.

Adult bots do not have functional mouths and survive for less than a month. Emergence of the adult bots is spread over many weeks so adult bots can be encountered all summer and into early fall before frosts kill them.

Even if bot flies didn't cause any harm inside the horse, control of them would be justified as the activity of the ovipositing female bots can cause horses to panic while being ridden or led. People can mistakenly blame this behavior on a bee attacking their horse, if they happen to see the insect darting at the horses. If horses were afraid of bees, they would never be found feeding in flower-filled meadows. Horses know the difference between those insects and troublesome flies. Stomping the front legs, head tossing, "hiding" their muzzles, and galloping retreats back to a dark barn can all indicate harassment by bot flies.

Use Products Effective Against Bots

To reduce bot fly populations and as part of a good internal parasite program, always include a product effective against bots for use in the fall after hard frosts. During the summer, horse bot eggs can be manually removed from the front legs. Commercial products that use a lubricant and abrasive block to remove bot eggs on the legs are safer than shaving razors.

The other species of bot's eggs are harder to see and remove. Be careful and practice good hygiene when removing the eggs because accidental contact of a bot egg to your mouth or eye can result in an uncomfortable but short-lived case of myiasis (maggot infestation) in humans.

Fly repellents have little effect on adult bots as the flies hover and don't make much physical contact with the horse. The topical application of some insecticidal repellent products under the jaws of the horse may kill the larvae of the throat bot, but no research has been done on this theory.

To learn more about this and other horse pests, please visit:
- http://www.extension.org/pages/10279/ stomach-bots-in-horses

- http://wiki.bugwood.org/HPIPM:Horse_Bot_Flies

- http://entnemdept.ifas.ufl.edu/slansky/botfly/links/ links1.htm

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