

Good Neighbor Practices Through Fly Control

A guide to fly management

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With the ever-encroaching rural development on agricultural lands, it is important to maintain good neighbor practices. Your farm(s) is, no doubt, already implementing an integrated pest management (IPM) program for fly control. IPM includes all of the best pest management techniques including cultural, sanitation, mechanical and chemical control measures. However, it is important to share with the community your experience with fly management techniques and your commitment to fly population management.

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This article can serve as a tool to guide your neighbors in their own fly management program. In order to communicate effectively, however, it is important that we have a good understanding of what our target pests are and the effective methods needed to manage them.

Fly classification

Flies are classified in the family Diptera, meaning two wings. The number of wings is how we can separate a fly (two wings) from all other insect taxa such as wasps (four wings). There are many other insects that have fly in their name (dragonfly, butterfly, firefly), but are not actually flies. Notice how all of those examples are spelled as one word?

The common names of true flies, however, are spelled as two or more separate words (house fly, blow fly, soldier fly). Then there are many other fly species that don't have fly in their name at all like mosquitoes, midges and gnats. Distinguishing between fly species can be much more difficult without extensive training in identification, curation techniques and the use of a microscope.



There are many species of flies that affect rural residences, hobby farms and production animal facilities. House flies, face flies, stable flies and horn flies are all part of the same family (Muscidae) and can look very similar. House flies are about the same size as face and stable flies but larger than horn flies. House and face flies have sponge-like mouthparts incapable of biting, whereas stable flies and horn flies can deliver a painful "bite" with their piercing mouthparts used to take a blood meal. Behavior can help identify these species.

Horn flies cluster on the withers, back and sides of cattle and will move to the belly during the hottest parts of the day. The abdomen of a stable fly has seven rounded dark spots on the upper surface. Blow flies (family Calliphoridae) are most often metallic green or blue and are the same size or larger than house flies. Like house flies, they have sponge-like mouthparts used to soak up liquids. *Kaufman Field Guide to Insects of North America* is an excellent resource for fast identification in the field.

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House flies. House flies (*Musca domestica*) are a cosmopolitan and ubiquitous species throughout temperate and tropical climates. They are scavengers eating animal waste and trash. They breed in moist decaying matter, carrion, spilled feed and animal waste. Each female can lay up to 500 eggs in batches of about 100 (Sanchez-Arroyo and Capinera, 2017). At optimal temperatures, it can take house flies only 1 week to complete their life cycle. Adult house flies are capable of flying up to 20 miles from their point of origin, but typically only travel a mile or two from their breeding site (Tomberlin and Drees, 2007).



Face flies. Face flies (*Musca autumnalis*) feed on animal secretions from mucosa, nectar and dung liquids. They cluster on the faces of animals causing excessive annoyance. Females lay their eggs on very fresh animal droppings and complete their lifecycle in 2 to 3 weeks (Cornell, 2017). Face flies are strong fliers that can travel several miles.



Stable flies. Stable flies (*Stomoxys calcitrans*) breed in wet straw, manure, spilled feeds, grass clippings and decaying vegetation. Each female fly lives up to 30 days and lays 200 to 400 eggs during her lifetime. Under optimum conditions, development from egg to adult takes about 3 weeks (Cornell, 2017).



Horn flies. Horn flies (*Haematobia irritans*) lay their eggs under the edges of fresh dung pats. They can develop into adults in as little as 10 days. Horn flies are strong fliers and can migrate up to 10 miles in search of a host (Gregor et al., 2002).



Blow flies. Blow flies (*Lucilia sericata*) prefer to reproduce in decaying animal carcasses, dog manure and wet garbage. Female blow flies lay up to 1300 eggs in batches of about 150–200 (Rueda et al., 2010). Blow flies will travel over 250 yards per day in search of food and breeding sites (Smith and Wall, 1998).



Fly management

Sanitation practices. Good sanitation practices are the first step in the management of nuisance fly species. This means removal or management of unnecessary harborage (tall grass), breeding sites (weeds) and food.

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Organic material that is very dry will not support fly production. You can essentially eliminate fly development in manure by reducing the moisture content to 30 percent (Tomberlin and Drees, 2007). This also makes the manure lighter and easier to move. You can also increase the drying rate of manure by spreading it thinner rather than stacking it tall in compost piles.

All carrion, such as dead birds and rodents, should be disposed of or composted immediately. Clean up any spilled feed and manure, even from pets such as rabbits, fowl, dogs, etc., especially if it is wet. Pets can play a major role in fly activity around residences. Use topical treatments approved for the target host species such as horses, goats, cattle, dogs and cats.

Cultural practices. Flies cannot easily move against the wind and prefer calm, restful areas. Wind breaks can actually exacerbate fly problems by providing them with shelter. Minimizing the vegetation and pruning the trees will increase air movement and decrease fly activity. Simply walking through calm areas is a useful fly scouting tool as they will fly as you pass by. It may be necessary to apply insecticides in these areas. If it becomes difficult to use your deck area for grilling, it may be time for washing away spilled grease and food.

Another important cultural practice is to eliminate or manage any standing water. This is particularly important for mosquito control. Clean out and grade water ditches so that water drains properly. Make sure rain water properly drains away from buildings. Mosquito Dunks[®] can be placed in standing water to manage mosquito larvae.

Mechanical controls. Mechanical control can be effective in small, enclosed areas such as mechanical rooms, offices, locker rooms, small barns, porches and garages. Mechanical

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control includes fly traps, sticky fly strips, funnel-type traps, and fly zappers.

Chemical controls. Insecticides are the next line of defense against pest populations. It is important to always follow label recommendations. In the case of flies, residual surface sprays can be used where animals are not present; animals can re-enter treated areas as soon as they are dry. Apply residual sprays on the exterior of homes, barns, office buildings and in and around manure sheds. For this purpose, microencapsulated formulations will provide the longest residual [see Dr. Catangui's list of empty-barn residual sprays, Table 4, on page 12]. Apply residual surface sprays where flies rest and breed. Treat outside of buildings around openings into structures.

With animals present, we are limited to a handful of active ingredients that are approved for on or over animals [see on-animal sprays, Table 3, on page 11]. Most of these on-animal insecticidal products are natural pyrethrins, but there are some permethrin products as well as spinosad and one organophosphate. The most practical way to knock down adult fly population blooms is to use mechanical misters or foggers to deliver ultra-low volume (ULV) insecticide to fill large spaces. Fans should be shut off to avoid moving the insecticide outside to undesired locations and outdoor treatments should be made when wind will not cause excessive drift. It should be noted that these are rescue treatments that mostly affect the adult stage and only kill insects that particles of insecticides touch. There is little to no residual action with ULV treatments.

Fly baits. Fly baits are often a necessary supplement to residual sprays and rescue treatments [see Table 2 on page 11]. Fly baits use sex pheromones to locally attract flies from a very short distance. It may not be wise to apply fly baits directly in front of entrances to a residence. Fly baits can be used wherever animals do not have access to them.

IGRs. Insect growth regulators (IGRs), or larvicides, are used to kill the immature stages of flies (maggots) [see Table 5 on page 12]. They interfere with the hormones of their target organism to either keep them in the immature stage or prevent them from successfully molting. IGRs should only be applied where flies breed, such as in manure.

Communicating our fly efforts

So, how do we communicate the information about our fly management efforts to our community? Create a written integrated pest management (IPM) program for your operation to document your efforts. Be ready to tell how you are implementing an IPM program that involves cultural practices, sanitation, mechanical and chemical control measures to combat all life stages of flies. Emphasize the extra efforts you are doing to identify the species, testing for developed resistance, rotating chemical classes, and regular monitoring of populations. Offer to teach your neighbors what you know. This article can serve as a reference that can be provided to any neighbors concerned about what they can do to minimize fly populations.

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