



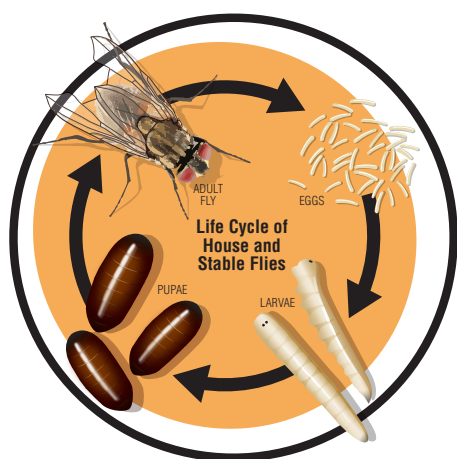
Filth Fly in Confined Livestock Facilities Protocol

Importance of Fly Control

- The most common pests in confined livestock facilities are house flies, which can spread disease, and stable flies, which are known for their painful bites
- Left unchecked, house and stable flies can significantly impact livestock health and production.

Filth Fly Habits and Life Cycle

- Flies have four life stages: egg, larva, pupa, and adult.
- Life cycles are short, averaging two to four weeks.
- Filth flies can have as many as 10 - 20 generations per year depending on regional temperatures.
- Breeding sources include decaying, moist organic matter. Any area where moist feed, bedding, and manure can accumulate could become a breeding source for flies. Flies cannot develop in dry media.
- These flies normally stay no more than two miles of their point of origin but can travel much further to find a breeding source.



Inspection

- Locate all breeding sites and potential fly attractants, which can include:
 - Areas where animals frequent – stalls and loafing areas, calf hutches, holding pens, transfer areas, farrowing rooms, grow out rooms, etc.
 - Feed areas such as silos, feed mixing areas, feed bunks, bale hay feeders, or other areas that can accumulate organic matter. Focus on areas where feed tends to spill and accumulate.
 - Manure accumulation – lagoons, manure stacks, holding/transfer areas.
- Larvae are common along edges of stalls and feed bunks, where they are less likely to be disturbed by skid steers or other equipment, and animals. It is not unusual to find small pockets with huge numbers of larvae. Focus on finding and eliminating those sources.
- Note bedding type(s) used. Straw bedding is more attractive to breeding flies than sawdust or sand bedding.
- Look for fecal spotting that indicates frequent resting areas.

Pre-Treatment

- Assess current fly population with traps, spot cards or other monitoring devices.
- Important Consideration Points:
 - Barnyards and other areas need to have proper drainage to reduce moisture. This includes filling in low spots and ensuring appropriate grading.
 - Sanitation is crucial. Ensure thorough cleaning of all problem areas to remove manure, feed, and other organic materials from potential breeding sites. Pesticides alone will not be successful.
 - Maintain a good manure management system.
 - Keep exterior doors closed whenever they are not in use.

HOUSE FLY <i>Musca domestica</i>	IDENTIFICATION	IMMATURES	ADULTS
	1/8-1/4 inches Dull gray in color, with four black stripes on the thorax Sponging mouthparts	Egg hatch in 8-20 hours 3 instars over 3-7 days Pupal stage 4 to 6 days	~500 eggs in several batches over lifetime Egg to adult in 7-10 days Live 15-25 days

STABLE FLY <i>Stomoxys calcitrans</i>	IDENTIFICATION	IMMATURES	ADULTS
	1/8-1/4 inches Dull gray in color, with tan patterned abdomen Piercing mouthparts	Egg hatch in 12-24 hours 3 instars ~12-13 days Pupal stage ~7 days	~500 eggs in several batches over lifetime Egg to adult in ~2-4 weeks Live 3-4 weeks



Interior Control Measures

- On and over animal applications are a good option for knockdown of adult flies.
 - Direct applications to parts of the body commonly attacked by fly species at your location. Note that stable flies are typically found on the legs.
 - Selecting oil or water-based formulas: Oil-based formulations (ex. ULD® BP-100 Contact Insecticide II) are sometimes preferred because the product stays on the surface bit longer. Water-based formulations tend to disperse more quickly and are sold as concentrates.
 - For best results, apply in calm conditions to ensure mist remains airborne as long as possible.
 - Close milk bulk lids, cover or remove milking utensils before application. Wash teats before milking.
 - Open and ventilate before reoccupying.
- For interior applications, apply Tobex® Multi MoA Concentrate or Sumari® Insecticide to resting areas, accumulated manure, bedding or other breeding sources identified during the inspection.
 - Focus inspections and treatment on edges of stalls, feed bunks, etc. where breeding sources are less likely to be disturbed.

Recommended Spray Equipment

- Cold foggers (ULV) – Generate fog by a mechanical action that breaks down the liquid while combining it with high volume of air at low pressure. Users can calibrate the unit to produce droplets of the optimum size for the situation or product being used. The most effective droplet size is 5 - 15 microns.
- Backpack or hand sprayer – Commonly used for spot, crack or crevice treatments around the premises. Users can opt for fan spray or pin stream. Do not apply insecticide to runoff.

Exterior Control Measures

- Rotate Sumari with Tobex, a microencapsulated pyrethroid, in areas where animals are not present and a longer residual is desired. Both products are formulated with an insect growth regulator (IGR) to break the house fly life cycle. Use appropriate residual insecticides in areas where flies may rest or find entrance into a structure. Additional considerations include:
 - House and stable flies are daytime insects that rest in protected areas at night (vegetation, walls, fence lines, etc.)
 - Move and clean calf hutches regularly, then treat with residual insecticide and IGR.
 - Walls around exterior doors and windows should be treated with spot applications.
 - Keep animals out of areas treated with residual insecticide until the product dries.
- Apply IGRs and baits to fly breeding and resting areas.
 - Flynexx® Granules and NyGuard® IGR Concentrate should be applied to fly breeding sites and reduce the population over time.
 - Decimari® Fly Bait can be applied where flies are resting.
 - Placing fly bait in stations can protect the bait from weather and non-target animals.

Post-Treatment

- Check trap counts to make sure the population is declining. Control should be gained within several days if all resting, breeding and feeding sites are treated.
- If control is not achieved, re-inspect to make sure all relevant areas have been cleaned and treated.
- If necessary, examine cleaning and treatment schedule. Fly control is easier before population explosions than after. Inconsistent manure/soiled bedding management may also allow development and emergence of a new generation of flies.

Common Resting and Breeding Sites

OUTDOORS:

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| • Spilled and/or accumulated feed, including feed mixing areas, silage storage areas, feed bunk, bale hay, etc. | • Vegetation, fence lines and other structures near animals |
| • Accumulated manure | • Drainage areas and/or stagnant water |
| • Animal bedding, especially around calf hutches | • Organic refuse and litter, garbage areas |
| • Around waterers | • In and under equipment |
| • Walls | • Garbage cans |

INDOORS:

- | | |
|---|--------------------------|
| • Stalls and loafing areas | • Flush lanes |
| • Animal bedding, especially around edges of stalls | • Walls and ceilings |
| • Spilled and/or accumulated feed | • In and under equipment |
| • Accumulated manure | • Garbage cans |
| | • Around waterers |



PRODUCT	IRAC GROUP	ANIMALS PRESENT DURING APPLICATION	RATES	APPLICATION METHODS
Decimari® Fly Bait	4A; 7C	Areas inaccessible to animals	6.3 oz. per 1,000 sq. ft. scattered or 1.6 oz. with 1 - 4 fl. oz. of water per 250 sq. ft. for paint-on or spray-on applications	Apply bait where house flies congregate. Select application type (scatter, bait station, paint-on or spray-on) to ensure bait is inaccessible to animals in accordance with the label.
EverGreen® Pro 60-6	3A	Yes	1-2 fl. oz. per gallon of water (house flies) 2-3 fl. oz. per gallon of water (stable flies)	Pay particular attention to topline, underline, flanks, withers and other infested areas. Apply to wet the hair thoroughly.
Flynexx® Granules	17	Areas inaccessible to animals	Dry scatter 1 lb per 200 sq. ft. Spray 1 lb per gallon of water per 200 sq. ft.	Treat edges and spillage areas around feed troughs, water troughs, where manure accumulates, and other fly breeding areas to control house fly and stable fly populations.
NyGuard® IGR Concentrate	7C	Poultry Only	4-12 ml per 1,500 sq. ft.	Apply alone or tank mixed with an adulticide. Apply to areas where insects are known to rest or breed.
Riptide® Waterbased Pyrethrin ULV	3A	Yes	For over animal applications, including cattle, poultry, swine, and other livestock: • 0.25-1 fl. oz. undiluted or 1-2 fl. oz. diluted per 1,000 cu. ft. of room space For direct spray on beef and dairy cattle: • Dilute 1 part concentrate with 49 parts water and spray directly	Direct space spray above animals with conventional ULV or fogger adjusted to delivery aerosol size droplets. For on animal applications, lightly mist for flies and thoroughly wet for lice. Automatic system nozzles should not exceed 1.25 fl. oz. of solution per minute, with one nozzle covering 100 sq. ft. Set system timer to operate in accordance with equipment directions.
Sector® Misting Concentrate	3A	Yes	0.32-1.28 fl. oz. per gallon for on animal applications. See label for automatic misting and ULV spraying system rate	On animal applications should thoroughly wet the hair with particular attention to body areas attacked by flies. Automatic system nozzles should not exceed 1.25 fl. oz. of solution per minute, with one nozzle covering 100 sq. ft. Set system timer to operate in accordance with equipment directions.
Sumari® Insecticide	4A; 7C	No	1 fl. oz. per gallon per 1,000 sq. ft.	Directly spray with a spot or crack and crevice treatment to kill house flies and other listed pests.
Tobex® Multi MoA Concentrate	3A; 7C	No	1-2 fl. oz. per gallon per 1,000 sq. ft.	To kill listed flying insects, apply as a general surface or spot treatment. Remove animals from area being treated.
Troika® Farm and Livestock Aerosol	3A	Yes	2 seconds per 1,000 cu. ft. of space (animal quarters) 3 seconds on each side (livestock treatment)	In animal quarters, close windows and doors and spray, keep area closed for 10 min after spraying. When applying on livestock, spray each side being careful to spray back, withers, and forelegs thoroughly.
Troika® Pour-On	3A	Yes	Apply 6ml (0.2 fl. oz.) per 100 lbs. body weight of animal up to maximum 60ml (2 fl. oz.) for any one animal	Pour-On: Pour correct dose along back and down face. Ready To Use Spray: Use undiluted to apply directly to neck, face, back, legs and ears. Automatic systems must be calibrated to deliver proper dose.
ULD® BP-100 Contact Insecticide II	3A	Yes	For over animal applications, including cattle, poultry, swine, and other livestock: • 1 fl. oz. undiluted or 1-2 fl. oz. diluted per 1,000 cu. ft. of room space For direct spray on beef and dairy cattle, and horses: • 2 fl. oz. per adult animal sufficient to wet the hair but not soak the hide	Select dilution and apply with ULV equipment over animals or through indoor misting systems.

Tips and Tricks From the MGK Technical Department

1. Incorporate IGRs as part of a proactive approach to fly control. An IGR like NyGuard can be tank mixed with adulticides for faster results.
2. Include a synergist like piperonyl butoxide (PBO) in your tank as a way to combat insecticide resistance and improve product performance.
3. Active ingredient rotation to a different mode of action is recommended to prevent resistance.
4. Understand how active ingredients work to better use your insecticides. Residual active ingredients like lambda cyhalothrin in Tobex are great for premise applications. Pyrethrins (ex. ULD BP-100) work best as a contact insecticide, so aim to directly spray as many pests as possible. IGRs provide the best results when applied to pest breeding areas.



FLY BAITS



Decimari® Fly Bait

- Contains NyGuard® IGR for dual modes of action to target the entire fly population
- Unique formulation attracts both male and female adult house flies
- Versatile application methods of scatter, paint-on or bait station allow effective use across multiple surfaces where flies rest and breed

INSECT GROWTH REGULATORS



Flynexx® Granules

- Insect growth regulator that disrupts the fly larvae molting process
- Water-soluble granule suitable for dry scattering or spraying to manure and other fly breeding sources
- Can be used simultaneously with adulticides



NyGuard® IGR Concentrate

- Insect growth regulator that keeps insects in juvenile state and provides residual activity
- Breaks life cycle of over 50 insects and is effective at low concentrations
- Can be tank mixed with adulticides to control immature and adult insects

PREMISE SPRAYS



Sumari® Insecticide

- Formulated with NyGuard® IGR for dual modes of action to control immature and adult insects
- Contains clothianidin, offering a rotational option for pyrethroid products
- Provides residual control of insects



Tobex® Multi MoA Concentrate

- Combines a knockdown agent with controlled-release technology for residual control
- Formulated with NyGuard® IGR for dual modes of action to control immature and adult insects
- Synergized with piperonyl butoxide (PBO) to combat metabolic resistance and increase effectiveness

OVER-ANIMAL INSECTICIDES



EverGreen® Pro 60-6

- Contains botanically based pyrethrins synergized with piperonyl butoxide (PBO) for knockdown and kill
- Formulated with a 1:10 pyrethrins to PBO ratio to combat resistance and increase effectiveness
- No withholding time periods for use before animal processing



Riptide® Waterbased Pyrethrin ULV

- Contains botanically based pyrethrins synergized with piperonyl butoxide (PBO) for knockdown and kill of listed insects
- Formulated with a 1:5 pyrethrins to PBO ratio to combat resistance and increase effectiveness
- Designed for use in automatic misting systems or can be manually applied



Sector® Misting Concentrate

- Formulated with synergized permethrin to provide knockdown and residual control of insects
- Synergized with piperonyl butoxide (PBO) to combat metabolic resistance and increase effectiveness
- Water-based insecticide that can be automatically misted or manually applied



Troika® Farm and Livestock Aerosol

- Provides a quick kill and residual control up to 4 weeks
- Water-based, synergized formula containing botanically based pyrethrins and permethrin
- Synergized with piperonyl butoxide (PBO) to combat metabolic resistance and increase effectiveness



Troika® Pour-On

- Contains permethrin, synergist and botanically based pyrethrins for fast control
- Synergized with piperonyl butoxide to help combat metabolic resistance
- Ready-to-use, oil-based formulation that is approved for daily application



ULD® BP-100 Contact Insecticide II

- Oil-based fogging concentrate containing botanically based pyrethrins synergized with piperonyl butoxide (PBO)
- Formulated with a 1:5 pyrethrins to PBO ratio to combat resistance and increase effectiveness
- No withholding time periods for use before animal processing

Contact your local MGK or distributor sales representative for more information.

See the label for a full list of insects controlled, detailed instructions and proper PPE.

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