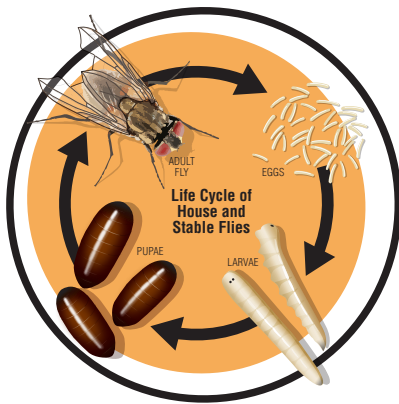






Filth Fly Protocol for Dairy and Confined Livestock Facilities

Filth Fly Habits and Life Cycle

- The most common pests for dairy and confined livestock facilities are house and stable flies. House flies are annoying, with potential to spread disease. Stable flies have painful bites. Left unchecked, these flies can have significant impact on production.
- 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 as far as 20 miles to find a breeding source.



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 Live 15-25 days Egg to adult in 7-10 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 Live 3-4 weeks Egg to adult in ~2-4 weeks

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.

Inspection

- Locate all breeding sites and potential fly attractants, which can include:
 - Areas where cows frequent – calf hutches, stalls and loafing areas, holding pens, transfer areas, etc.
 - Feed areas such as silos, feed mixing areas, feed bunks, bale hay feeders, or other areas that can accumulate organic matter. None in 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 cattle. It is not unusual to find small pockets with huge numbers of larvae. Focus in particular 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.

Interior Control Measures

- Prior to any spray treatments, follow all label directions, restrictions, and PPE requirements.
- On/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- vs. water-based formulas: Oil-based formulations (ex. ULD BP-100) are sometimes preferred because the product stays on a surface a 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 or Sumari 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.

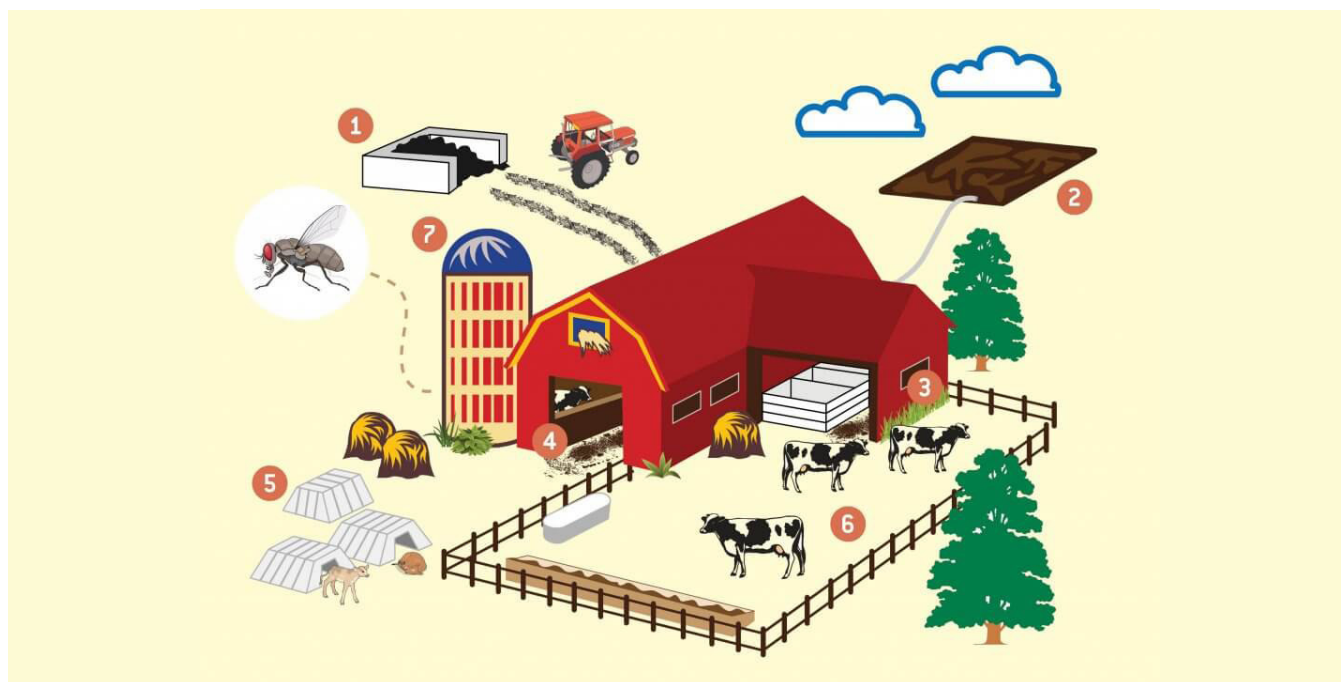
Exterior Control Measures

- Rotate Sumari with Tobex, a microencapsulated pyrethroid, in areas where animals are not present where a longer residual is desired. Both products already have an insect growth regulator (IGR) to break the house fly life cycle. Use appropriate residual insecticides in the following areas:
 - 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 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.

PRODUCT	RATES	APPLICATION METHODS
ULD BP-100 Contact Insecticide II	1 fl. oz. undiluted or 1-2 fl. oz. diluted per 1,000 cu. ft. of room space. Apply 2 fl. oz. per adult beef cattle or dairy cattle sufficient to wet the hair but not soak the hide.	Select dilution and apply with ULD equipment over animals or through indoor misting systems.
Tobex Multi MoA Concentrate	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.
Sumari Insecticide	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.
Flynexx Granules	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.
Sector Misting Concentrate	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.
Riptide Waterbased Pyrethrin ULV	0.25-1 fl. oz. undiluted or 1-2 fl. oz. diluted per 1,000 cu. ft. of room space for over animal applications. Dilute 1 part concentrate with 49 parts water and spray directly to beef and dairy cattle.	Direct space spray above animals with conventional ULV or fogger adjusted to delivery aerosol size droplets. 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.
Decimari Fly Bait	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.
NyGuard® IGR Concentrate	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.
Troika® Misting Concentrate	0.20 fl. oz. per 1,000 cu. ft. Or diluted at one part concentrate to 10 parts water and applied at the rate of 1-1.8 fl. oz. of diluted product per 1,000 cu. ft.	Direct spray toward the upper portions of the enclosure, above the animals, filling the room with mist or fog. Animals may be present during application.
EverGreen® Pro 60-6 Concentrate	1-2 fl. oz. per gallon of water (house flies) 2-3 fl. oz. per gallon of water (stable flies)	Apply to wet the hair thoroughly.



Tips and Tricks from the MGK Technical Department

- 1. House flies find sand/manure stacking pads hospitable.** Apply Onslaught FastCap, a microencapsulated insecticide, for long residual control.
- 2. Lagoons provide everything house flies and mosquitoes need for development.** Treat along the edges with NyGuard IGR to stop development of fly larvae.
- 3. Don't forget the cattle alleyway.** Though cattle aren't in them for long, fly problems can still develop. Spray insecticides on walls where filth flies tend to rest.
- 4. Keep cattle comfortable in the stalls.** Apply pyrethrin-based products such as ULD BP-100 or Evergreen Pro 60-6 for quick knockdown.
- 5. Calf hutches are prime areas for fly activity.** Treat around each hutch with a residual insecticide, Decimari Fly Bait and apply the permethrin-based insecticide Sector over-animal.
- 6. Premise applications are often forgotten, but necessary to control house flies.** Treat soil with a microencapsulated insecticide and Tobex for quick knockdown and residual control.
- 7. Stable flies develop in dryer areas where hay and feed are stored.** Include premise applications to areas around feed silos in your plan for fly control.

Common Resting and Breeding Sites

INDOORS:

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

OUTDOORS:

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

FLY BAITS



Decimari® Fly Bait

- For use in and around livestock facilities
- First fly bait with dual modes of action
- Contains NyGuard® IGR
- Attracts and kills house flies

INSECT GROWTH REGULATORS



Flynexx® Granules

- Apply to manure and other fly breeding sites
- Insect growth regulator disrupts the fly larvae molting process
- Water-soluble granule for dry scattering or spraying
- Controls house flies and stable flies

NyGuard® IGR Concentrate

- For use in and around livestock facilities
- Insect growth regulator that provides long-lasting residual activity and keeps insects in juvenile state
- Breaks life cycle of over 50 insects and is effective at low concentrations
- Can be tank mixed with other residual insecticides, adding another mode of action

PREMISE SPRAYS



Sumari® Insecticide

- Provides residual control in and around livestock facilities
- Dual modes of action
- Contains NyGuard® IGR
- Kills house flies, mosquitoes, ants and other listed pests

Tobex® Multi MoA Concentrate

- Provides residual control in and around livestock facilities
- Combines the power of a fast-acting knockdown with controlled-release technology
- Dual modes of action
- Contains NyGuard® IGR
- Kills house flies, mosquitoes and other listed pests



OVER-ANIMAL INSECTICIDES



ULD® BP-100

- For use on and over animals
- Oil-based fogging concentrate
- Contains pyrethrins, a botanical insecticide
- Kills house flies, stable flies, mosquitoes, ticks, lice and other listed insects



Sector® Misting Concentrate

- For use on and over animals and in livestock facilities
- Synergized formula provides quick knockdown and residual control
- Kills house flies, stable flies, mosquitoes, ticks, lice and other listed insects
- Labeled for use in hand-held sprayers and automatic misting systems



Riptide® Waterbased Pyrethrin ULV

- For use on and over animals and in livestock facilities
- Contains pyrethrins, a botanical insecticide
- Kills house flies, stable flies, mosquitoes and other listed pests
- Labeled for use in hand-held sprayers and automatic misting systems



Troika® Misting Concentrate

- For use over animals and in livestock facilities
- Dual active, synergized formula for quick knockdown and kill
- Labeled for use in hand-held sprayers and automatic misting systems
- Kills flies, mosquitoes, gnats and other listed insects



EverGreen® Pro 60-6 Concentrate

- For use on livestock and in their facilities
- Flushes insects out of hiding for a faster, more complete kill
- Synergized formula containing pyrethrins, a botanical insecticide
- Kills a broad spectrum of insects including flies, cockroaches and other listed pests



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