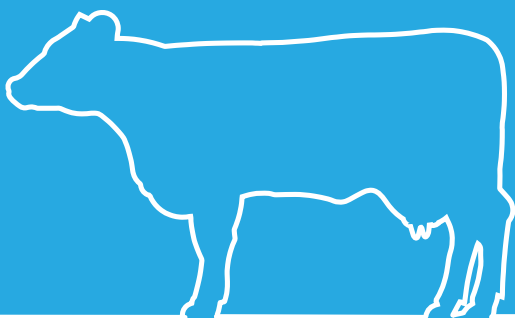




Integrated Pest Management

Program Planning Guide



CENTRAL *Life Sciences*[®]

A composite image featuring two cows against a solid blue background. In the upper left, a black and white cow (likely a Holstein) is shown from the chest up, facing forward. In the lower right, a solid black cow is shown in profile, facing right. The text is positioned to the right of the black and white cow.

THE IMPACT OF FLIES

Flies are more than a nuisance; they are a legitimate problem for dairy and beef producers. Whether on pasture or in confinement, cattle are constantly exposed to various species of flies and the negative effects they can have.

Beyond annoying animals and employees alike, flies can severely interfere with cattle profitability. Flies can impact an operation's bottom line by affecting milk production and quality, decreasing weight gain and spreading harmful diseases among herds.

THE FOUR SPECIES OF FLY MOST COMMONLY AFFECTING CATTLE



HOUSE FLIES

- Feed freely on human food, fresh animal waste and rotting garbage
- Prefer manure as a breeding source as well as warm, decaying organic matter
- Implicated in the transmission of more than 65 disease organisms, including the bacteria that cause mastitis



STABLE FLIES

- Feed on blood, inflicting painful bites on a variety of animals including humans
- Breed in rotting vegetation, urine-soaked bedding and manure/vegetation mixtures
- Shown to cause reduced weight gain in beef cattle and reduced milk production in dairy cows



FACE FLIES

- Feed on secretions with sponging mouthparts around cattle's eyes, nose and mouth
- Typically lay eggs on fresh, undisturbed manure
- A known vector of eye diseases, including infectious bovine pink eye



HORN FLIES

- Use piercing mouthparts to take up to 40 blood meals per day
- Congregate on the backs of cattle, leaving only to lay eggs in fresh manure
- Painful bites can interfere with feed efficiency and weight gain of cattle

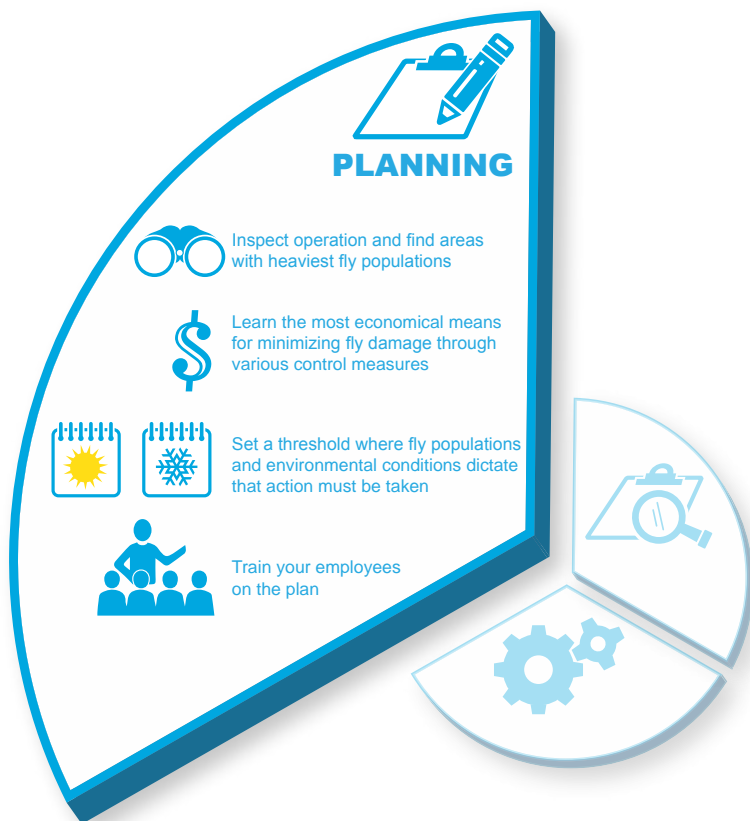
P•I•E APPROACH TO YOUR IPM



A comprehensive IPM program consists of three phases:

- Planning
 - Helps operators understand the extent of their pest problems
 - Charts a course to address issues
- Implementation
 - Execute a multi-method approach to fly abatement
- Evaluation
 - Follow up on program effectiveness
 - Checking on a regular basis
 - Reviewing/adapting a program as needed

STEP 1: PLAN YOUR PROGRAM



RECOMMENDED PRODUCTS

QUICKSTRIKE® FLY
ABATEMENT STRIP

FLY STIK™
STICKY FLY TRAP

FLY TERMINATOR®
PRO FLY TRAP

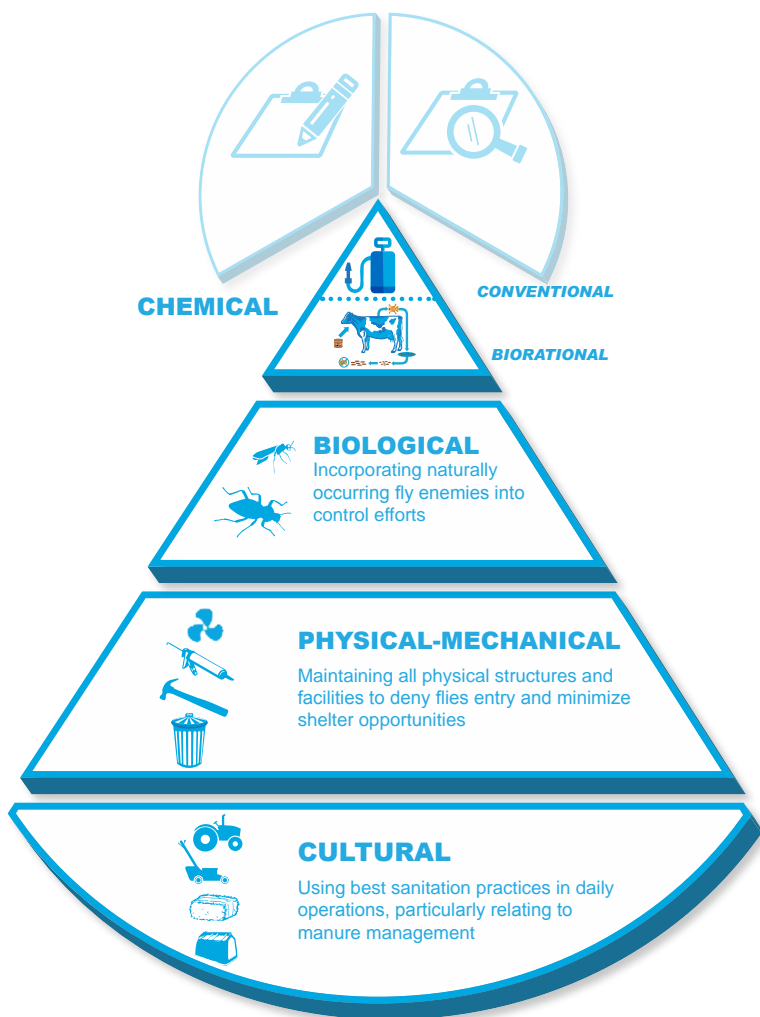
BITE FREE™ STABLE
FLY TRAP

TRAP 'N TOSS™
DISPOSABLE FLY TRAP

FLYRELIEF™
DISPOSABLE FLY TRAP

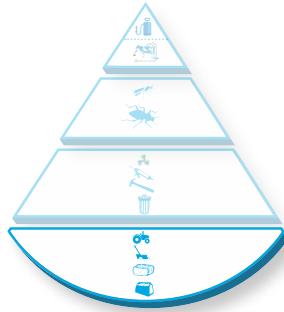
Proper planning of an IPM program is essential to maximizing the effectiveness of control efforts. This phase lays the groundwork for the plan, and sets the course of action needed to control pest problems. During this phase, thoroughly monitor and measure fly activity around an operation (some recommended Starbar® products to aid in this phase are in the box on the left). This will help producers more fully understand the extent of the fly problem, know the most important target areas to address and be better equipped to determine the best mix of tactics for maximum control.

STEP 2: IMPLEMENT A COMPREHENSIVE STRATEGY



Once the proper planning has occurred, the **Implementation** phase of an IPM program begins. This phase is a complete mix of the tactics that will be used to help control fly populations. Implementation efforts are built around the four components of the IPM Pyramid – Cultural, Physical/Mechanical, Biological and Chemical.

IMPLEMENTATION: CULTURAL



MANURE MANAGEMENT

Manage manure in a timely and consistent manner, as it is the primary breeding site for flies. Also, regularly clean spilled milk and feed.



MAINTAIN WEEDS AND GRASS

Regularly maintain weeds and tall grasses as they provide an ideal resting place. On pasture, clear or spread out grass clumps, or mulch when possible.



CHANGE BEDDING

Clean spilled milk or milk replacer and decaying straw and wood shavings in calf bedding, which can also serve as a breeding site.



ROTATE HUTCHES

Regularly clean and move calf hutches and pens and keep them well ventilated.

Comprehensive fly control begins in the **Cultural** phase where daily habits are established and best sanitation practices are implemented around the facility. The most essential component of Cultural efforts is proper manure management in order to limit a primary food source and breeding ground for flies. Other essential Cultural efforts include landscape maintenance and routine cleaning of spilled feed and other vegetative buildup from cattle areas.

IMPLEMENTATION: PHYSICAL/MECHANICAL



RECOMMENDED PRODUCTS

CAPTIVATOR® FLY TRAP

EZ TRAP® FLY TRAP

FLY STIK™
STICKY FLY TRAP

FLYRELIEF™
DISPOSABLE FLY TRAP

TRAP 'N TOSS™
DISPOSABLE FLY TRAP



IMPROVE AIR FLOW

Install fans to produce a downward and outward air flow that can limit fly activity in barns and other enclosed spaces.



DENY ENTRY

Remove fly entry points in physical structures by caulking, filling holes and sealing around electrical outlets.



REPAIR STRUCTURES

Patch or seal any cracks or crevices in structures, and secure fine-mesh screens over any windows.



SEAL REFUSE

Keep garbage tightly sealed and, ideally, housed in an enclosed area.

Physical/Mechanical efforts include the maintenance of all structures and facilities that deny flies access points and make the areas less hospitable to the pests. These efforts are also aided by the strategic placement of non-insecticidal sticky, bag and jug traps around the premises. Many of these options are odor free, providing ideal fits for enclosed spaces.

IMPLEMENTATION: BIOLOGICAL



PARASITIC WASPS

Parasitic wasps lay eggs inside of fly pupae, interrupting the life cycle as they feed from within.

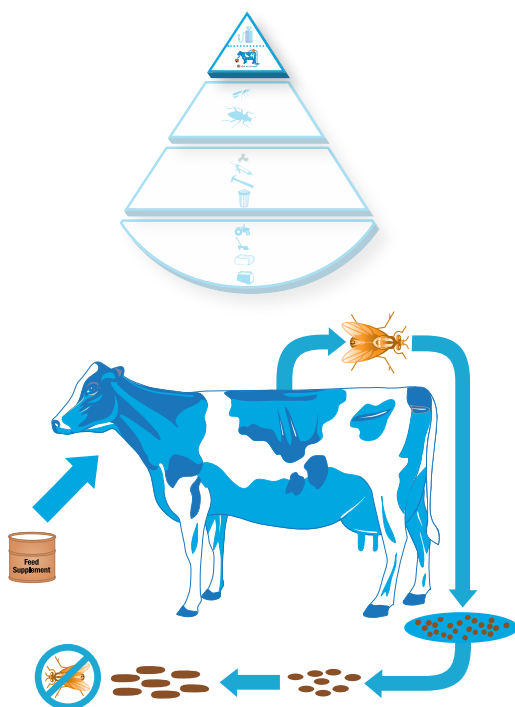


PREDATORY BEETLES

Some beetle species – such as the Hister beetle – are known to locate dung and feed on the fly larvae found there.

Biological control incorporates naturally occurring fly enemies to help keep their populations in check. Predatory beetles and mites, parasitic wasps, and fly pathogens are all beneficial pests that can be used as part of an IPM program to maximize fly-control efforts with no adverse effect to animals or humans.

IMPLEMENTATION: CHEMICAL - BIORATIONAL



RECOMMENDED PRODUCTS

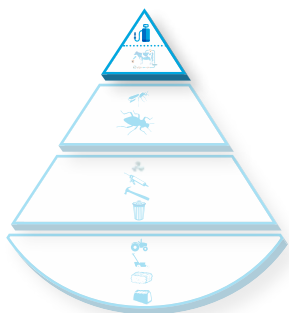
ClariFly® Larvicide works by interrupting the fly's life cycle, rather than through direct toxicity.

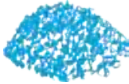



ClariFly® Add-Pack brings all of the benefits and control of ClariFly® Larvicide to calves, and it can be added to whole milk or milk replacer to establish a lifelong fly-control program.

Altosid® IGR specifically targets horn flies, the primary pest of concern affecting cattle in pasture. It has no known horn fly resistance and is not harmful to beneficial insects.

Once the first three components of IPM Implementation are in place, it is time to implement the **Chemical** phase. The "Biorational" portion of this phase includes the use of feed-through Insect Growth Regulators (IGRs), such as ClariFly® Larvicide for dairy cattle and others raised in confinement and Altosid® IGR for cattle raised on pasture. Feed-through fly control products work by delivering a key active ingredient to cattle, which is passed through into the animal's manure where flies lay eggs. The active ingredient interferes with the fly life cycle, preventing the adult pests from emerging from the manure. For best results, begin using ClariFly® Larvicide or Altosid® IGR in the feed mix early in the spring, 30 days before flies begin to appear through 30 days after the first frost.

IMPLEMENTATION: CHEMICAL - CONVENTIONAL



RECOMMENDED PRODUCTS	<div>QUIKSTRIKE® FLY BAIT</div> <div>GOLDEN MALRIN® FLY BAIT</div>	USE IN ROTATION	<div></div> <div>BAITS Starbar® fly baits feature a variety of attractants that pests can't resist, and they can be conveniently applied in most any area of an operation for quick kill of flies. For best results, regularly rotate baits on the operation.</div>
	<div>ADONIS™ 4F</div> <div>LAMBDA 9.7 CS</div> <div>PYRONYL™ CROP SPRAY</div>		<div></div> <div>PERIMETER SPRAYS AND FOGGERS Starbar offers a number of versatile liquid adulticide products for use in spray and fogging applications, featuring a range of active ingredients and synergists.</div>
	<div>CATTLE ARMOR™</div> <div>PROLATE/LINTOX HD™ INSECTICIDAL SPRAY & BACKRUBBER</div> <div>ATTACK-ALL® LIVESTOCK & PREMISE FLY SPRAY</div>		<div></div> <div>ON-ANIMAL Control flies and other nuisance pests directly at their source of impact with several on-animal spray, pour-on and backrubber treatments from Starbar.</div>
	<div>BITE FREE™ STABLE FLY TRAP</div> <div>FLY TERMINATOR® PRO FLY TRAP</div>		<div></div> <div>TRAPS Starbar offers a great variety of trap options – including odor-free solutions for enclosed spaces – that can help users monitor and measure fly populations in nearly every area of an operation.</div>

The “Conventional” portion of the **Chemical** phase includes the use of baits and traps, perimeter sprays and foggers, and on-animal treatments such as those from the Starbar® products lineup of solutions to help control adult flies. Incorporate a balanced mix of fly-control modes of action throughout the operation, and **ensure a rotation** of active ingredients to prevent resistance.

STEP 3: EVALUATING THE RESULTS



RECOMMENDED PRODUCTS

CAPTIVATOR® FLY TRAP

LURE-FLY™ FLY CATCHERS

FLY STIK™ STICKY
FLY TRAP

FLYRELIEF™
DISPOSABLE FLY TRAP

TRAP 'N TOSS™
DISPOSABLE FLY TRAP

Once an IPM plan has been established and put into action, it is essential to continually monitor the results to evaluate the effectiveness of the program. Track fly populations with speck cards and Starbar® jug, bag and sticky traps, documenting all progress. Once operators have determined what steps have proven successful and where they have areas for improvement, the IPM program can be adjusted to maximize fly control efforts moving forward.



**FOR MORE INFORMATION, CONTACT YOUR FEED DEALER,
VISIT WWW.CENTRALLIFESCIENCES.COM OR CALL 1-800-347-8272.**

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