WYOMING SCHOOL INTEGRATED PEST MANAGEMENT (IPM) FOR FILTH FLIES

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Wyoming School Integrated Pest Management (IPM) For Filth Flies

PROBLEMS CAUSED BY FILTH FLIES

Flies that invade cafeterias and kitchens and other facilities are not only a nuisance, they also present a health hazard because they can transfer disease-causing organisms from filth to food preparation surfaces.

PEST IDENTIFICATION AND BIOLOGY

House flies are strong fliers and one of the most common filth flies originating in garbage, manure, and vegetable waste and then (may infest) buildings.

House flies: *Musca domestica* are about 5/16-inch long. Their thorax is gray, with dark lines on the back. House fly larvae (maggots) are up to 1/2-inch long, white and legless, with a worm-like, tapering body to a point at the head.

The pupae are reddish brown, about 3/8-inch long and characterized by a

House Flies
Brown pupae upper left; white eggs - top center; adult flies, larvae lower left in photo.

House life cycle image courtesy, Clemson University - USDA Cooperative Extension Slide Series

House Fly
Image courtesy of Muhammad Mahdi Karim (www.micro-2macro.net)

Flesh Fly
Image courtesy of Saleem Hameed (https://commons.wikimedia.org)

Blow Fly
Image courtesy, Tom Murray (http://wiki.bugwood.org)

hard, brown shell. Larvae and pupae are found in garbage and feces.

Flesh flies in the family Sarcophagidae: adults generally have three black stripes on a gray thorax and black bristles on their abdomen (never metallic).

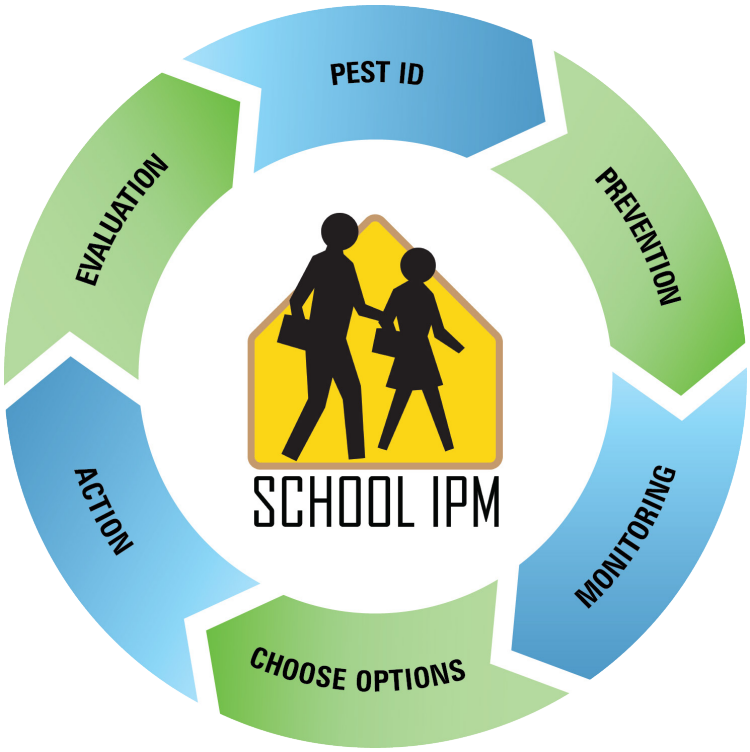
Blow-flies, carrion flies, bluebottles, greenbottles in the family Calliphoridae: commonly shiny with metallic coloring, often with blue, green, or black thoraces and abdomens.

Garbage and waste are places where filth fly larvae can develop and are often called "breeding sites." Flies can detect the odor of breeding sites over long distances. To digest solid foods, adult house flies liquefy food by regurgitating digestive fluids on the food. House flies have sponge-like mouthparts to suck up the liquefied food. They can transfer disease-causing organisms to drinks, food, and food preparation surfaces. They also defecate on the food during feeding.

To adequately manage these tough pests, good sanitation practices, removal of the breeding sites, and exclusion from buildings with window screens should be implemented. Due to filth flies high reproductive rate (over 100 eggs per female), they can easily develop resistance to some commonly used pesticides. Insecticide resistance is the ability of an insect population to withstand exposure to insecticides, and this is acquired by breeding among insects that have survived previous exposures to an insecticide that did not kill the whole population. The surviving insects are resistant either because biochemical mechanisms enable them to quickly break down the insecticide or behavioral adaptations enable them to avoid the insecticide.

Pesticide applications should be used only as the last resort, depending on the situation, and as instructed in the product label.

KEY COMPONENTS OF IPM IN SCHOOLS



There are 11 components of IPM in schools. Six are cyclic action steps that occur continuously in order. Following these steps continually makes pest control straightforward and effective.

Step 1: Pest Identification

Step 2: Prevention
- Maps
- Recordkeeping
- Set Action Thresholds

Step 3: Monitoring

Step 4: Analyze and Choose Options
- Notification

Step 5: Implementation/Action

Step 6: Evaluating
- Educating

FLY PREVENTION STRATEGIES

PREVENTION is the first line of defense and the most effective fly control action. Fly prevention includes exclusion and sanitation. Keeping indoor and outdoor areas clean is essential.

TRASH CANS AND DUMPSTERS (ELIMINATING FLY ATTRACTION AND BREEDING SITES)

Keep garbage dumpsters at least 75 feet away from all kitchen doorways and away from the buildings. Odors from trash thrown in dumpsters can attract thousands of flies from the surrounding area. Store garbage in sealed plastic bags within dumpsters with tight-fitting lids where feasible. Use trash can liners that seal with ties to exclude food and liquids from collecting in trash cans as well as reducing odors. Trash liners used for waste disposal should be thick enough to avoid tearing or puncturing by insects such as yellowjacket wasps.

Trash cans and dumpsters need to be cleaned and emptied frequently to eliminate odors that attract flies. Dumpsters can be rotated with fresh dumpsters and steam cleaned if they become filthy. If there is so much trash the lid cannot close, replace with a bigger container or schedule more frequent pickups.

To avoid attracting flies into a school building, place dumpsters and recycling containers upwind from the outside doors of the school, particularly for the doors to the kitchen or cafeteria. When dumpsters are downwind, flies are attracted to the waste odors and then find the odor trails the breeze blows down from the doorways. Flies can follow these odor trails and find their way into the building.

EXCLUSION (KEEPING FLIES OUT OF THE BUILDING)

Install screens over windows and vent holes to prevent flies from entering buildings. Weather-stripping or silicone caulk can be used to ensure a tight fit around windows and pipes and to seal cracks and holes.

Screen doors should be fitted with springs or automatic devices that close the screen door firmly after opening. External doors that cannot be screened should be fitted with automatic closing devices to keep them closed when not in use. Door sweeps and weather stripping that make full contact also keep insects from entering buildings.

Food should be covered as much as possible at picnics to prevent contamination.

SANITATION

The cleaner the area the less likely there will be fly problems.

- Clean up food and drink spills immediately.
- Thoroughly clean food preparation areas, including hard-to-reach areas.
- Keep equipment cleaned and maintained (including floor drains and vents)
- Repair water leaks in plumbing and gutters
- Eliminate standing water and any sources of moisture
- Remove any decaying yard clippings

- Properly clean and maintain exterior drains in trash handling areas including loading docks and indoor floor drains to avoid accumulation of organic matter and liquid.
- Empty mop buckets
- In food preparation areas, rinse all cans, bottles, and plastic containers before recycling or discarding.

ADDITIONAL CONSIDERATIONS TO PREVENT FLIES

- Make sure the air flows positively from and not into the kitchen.
- Trim bushes and vegetation away from buildings.
- Removing any pet feces near the facility also helps reduce attractive odors.
- Fallen fruit from trees attracts flies and other insects.
- Drainage will often aid fly control by getting rid of moisture accumulations.
- Outdoor lighting considerations:
  - Lighting at least 30 feet away and aimed back toward building so insects are not attracted directly to lights on the building.
  - Low wattage, low psi sodium lights are less attractive to insect than mercury vapor lights.
  - Yellow light attracts less insects than white light.
  - Time lights to go off intermittently if possible.

FACILITY MAPS

Maps help record and visualize where flies have been found and document chronic or seasonal fly activity areas. Pest sightings and problem areas can also be highlighted on maps.

RECORDKEEPING

Recordkeeping can be an essential part of integrated pest management as it helps establish a history of pest trends and problem areas as well as track which activities have worked best to control pests and anticipate seasonal pest problems. IPM records allow for more informed decision making in managing school pest problems in and around buildings. Knowing where, when, and what pests have been seen on facility grounds can focus weed control efforts and be helpful to professional pest control operators. Such documentation is critical in an IPM program, as treatment is based on monitoring and other information.

IPM records document proper pesticide use and can save money. The more information there is on record, the more useful the records will be. Records are best kept on a standard form to ensure necessary data is logged every time. The Pest Control Application Form includes the various types of information that may be recorded for each situation.

Since the data sheets are inclusive, not all items need recorded each time. For example, if no products are used when performing a certain action, entries relating to products are left blank. On every report, there should be a space for the applicator to make comments regarding the action taken including any unusual occurrences that could have an impact on results. Fill out the monitoring

forms and control activity forms in the IPM logbook at the time the monitoring and/or control activity is conducted. Records can also be useful in evaluating the success of pest management strategies.

Records can be maintained in an IPM logbook and may include:

PEST CONTROL ACTION/APPLICATION FORM

Records are not only required for pesticide applications but help document preventive measures and how well various actions or products work. These records can serve in forecasting when a problem may appear or when an outbreak may occur and can help the pest manager evaluate the success of the IPM program.

MAPS OF BUILDING AND GROUNDS

Maps help specify problem areas, show weed distribution, explain the situation to others, and track changes.

MATERIAL SAFETY DATA SHEETS AND PRODUCT LABELS

While Material Safety Data Sheets (MSDS) and product labels could be included in the IPM logbook, they need to be kept in a separate record in an area accessible to product handlers.

ACTION THRESHOLDS

More than three house flies in a kitchen area would indicate some prevention practices may need improvement.

MONITORING

Pinpointing any source of attractive odors or breeding sites is important. If there is a question regarding whether the flies are actually filth flies, specimens can be taken or sent to a county extension educator who should be able to assist in identification. If the extension educator cannot identify the specimen, they will be able to refer you to an extension entomologist specialist at the University of Wyoming who can identify pest insects. To collect specimens inside, gather dead specimens from windowsills and light fixtures. Individual flies captured for identification purposes should be held in a small container with tissue to preserve key identifying characters.

Inspection practices should include ensuring the prevention practices are being achieved and maintained.

ANALYZE AND CHOOSE OPTIONS

While prevention is the most effective management strategy for filth flies in and around facilities, a fly swatter works well for a few adult flies. Fly traps can be used to reduce adult fly populations, capture specimens for identification, and monitor the effectiveness of control programs. Fly traps are not toxic and are more selective than using insecticide. Do not place flypaper or sticky strips above or near food preparation areas.

NOTIFICATION

Advanced notification of pest control practices can play an important role in an IPM program. Keeping occupants informed can encourage assistance in keeping the area clean and keeping exterior doors closed. Communication with teachers and staff regarding pest control can lead to greater effectiveness.

IMPLEMENTATION/ACTION

Preventative tactics are the primary effective fly control actions. While pesticides are usually not the best means of managing filth fly problems, sometimes chemical control can be a valuable component of an IPM program. Always read and follow the entire pesticide label. Pyrethrin aerosols provide a quick-kill insecticide, reducing populations of flying insects for short-term results. Often this type of control provides temporary relief but cannot be relied upon to eliminate the problem.

EVALUATION

The last, yet integral, step in IPM is to evaluate and record how well the method or actions worked.

Evaluation is built into on-going monitoring and recording on the pest control data sheet.

Make notes regarding the following questions:

- Did actions have the desired effect?
- Was the pest prevented or managed to satisfaction?
- Was the method itself satisfactory?
- What else could prevent this pest situation in the future?

Documentation of the results of monitoring, control methods, and how well they worked is an essential component of IPM so one doesn't have to relearn how to deal with the same problems over and over. The evaluation also shows where there is need for improvement and helps fine-tune future actions.

EDUCATING

Inform students, teachers, and staff members of the importance of placing garbage inside proper containers. Garbage should not be left lying on the ground. Keeping windows screened and doors closed should be stressed.

MORE DETAILED FLY INFORMATION

Bugs Rule!: An Introduction to the World of Insects, 1st Edition, 480 pp, 2013, by Whitney Cranshaw and Richard Redak (Authors), Publisher: Princeton University Press, ISBN13: 978-0691124957

PCT Technician's Handbook, 4th Edition, 340 pp, by Richard Kramer and Joshua Kramer (Author), Jeff Fenner and Lisa Lupo (Editor) Publisher: GIE Inc., ISBN-10: 1883751306

Household Insects of the Rocky Mountain States, 96 pp, 1984, by W.S. Cranshaw, Colorado State University Extension, Bulletin 557A, 8 1/2 x 11 paperbound

NOTICE OF PESTICIDE APPLICATION

For further information regarding this notice, please contact the school IPM coordinator:

Name: _____

Phone number: _____

The following pesticides will be used at *[insert name of school]*: _____

Pesticide common name	Pesticide trade name	EPA registration number
Pesticide common name	Pesticide trade name	EPA registration number

The Office of Pesticide Programs of the United States Environmental Protection Agency has stated: "Where possible, persons who potentially are sensitive, such as pregnant women, infants, and children, should avoid any unnecessary pesticide exposure."

Location of the pesticide application: _____

_____

_____

Reason for the pesticide application: _____

_____

_____

If an **indoor application** the date and time it is planned:

DATE _____ TIME _____

In the case of an **outdoor application**, three dates must be listed, in chronological order, on which the outdoor application may take place if the preceding date is canceled.

DATE _____ DATE _____ DATE _____

Description of the possible adverse effects of the pesticides as per the Material Safety Data Sheets for the pesticides to be used, if available:

_____

_____

_____

Pesticide(s) product-label instructions and precautions related to public safety:

_____

_____

_____

_____

Not less than twelve (12) hours before application of pesticides within school buildings, signs shall be posted at main entrances to school buildings and at the entrances to the specific application area within buildings. If pesticide application is made outdoors to any area adjacent to a school building or on property used by the district for student activities or playgrounds, signs shall be posted immediately adjacent to the treated area and at the entrance to the district property. The signs shall remain posted for seventy-two (72) hours.

This SIGN template (Word document) is available on the website "Wyoming School IPM") (www.uwyo.edu/ipm)

Building Inspection/Monitoring Data Sheet

Date:

Names:

Phone number:

Email:

Room number or location	Pests or problem	Stage of pest	Pattern of problem or number of pests	Repairs needed

Comments:

This form (Excel spreadsheet) is available on the website "Wyoming School IPM" (www.uwyo.edu/ipm)

Pest Control Action/Application Form

*Date:	

*Name of applicator:					
*License number:					
Phone number:					
Start time of application	***Location of application**	***Crop or site**	**Target pest (species)**	**Target pest (growth stage)**	**Type of pesticide or control**
***Size of area treated**	***Product brand name or bio-control agent**	**Product formulation**	**Active ingredient**	**Percentage active ingredient**	***EPA reg. number**
Rate used	***Total amount product applied**	**Equipment used**	**List equipment settings**	**Nozzle type**	**Application pressure**
Wind speed	**Wind direction**	**Temperature**	**Approximate humidity**	**Results**	

General comments (e.g., source of bio-control agents, stage of host agents came from, and other factors)

Highlighted items are required for Wyoming School applications. Items with * are required for "RUP" applications.

This form (Excel spreadsheet) is available on the website "Wyoming School IPM" (www.uwyo.edu/ipm)

PEST SIGHTING LOG

Date	Time	Pest sighted	Number of pests	Who reported	Action taken

This form (Excel spreadsheet) is available on the website "Wyoming School IPM" (www.uwyo.edu/ipm)

Pesticide Application Notice

Distribution Date: _____

Date of Application: _____

Location of Application: _____

Pest to Be Controlled: _____

Name of Pesticide: _____

Type of Pesticide: _____

For More Information Contact: _____

The Wyoming Environmental Pesticide Control Act of 1973 requires notice be provided by school districts not less than seventy-two hours prior to pesticide application on school property and the district shall further notify students, teachers and staff.

Email records of the 72 hour notice may be one way of retaining this information.

This NOTIFICATION template (Word document) is available on the website "Wyoming School IPM" (www.uwyo.edu/ipm)

Trap Data Sheet

Date:

Name:

Phone number:

Email:

Trap number	Name of pest	Number caught	Trap number	Name of pest	Number caught

Comments:

This data sheet template (Word template) is available on the website "Wyoming School IPM" (www.uwyo.edu/ipm)