2010 | ISSUE 8
PESTWEST ENVIRONMENTAL

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PESTWEST 411

NEWSLETTER

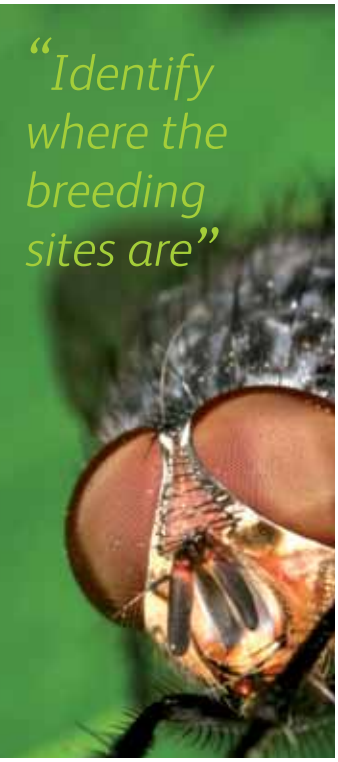
JOB: 8941

DID YOU KNOW...

Musca domestica are hard to swat because they react to movement five times faster than humans do.

Musca domestica taste with special receptors on their tarsi ('feet'), which are 10 million times more sensitive to sugar than the human tongue.

Some scientists are making the case for the Musca domestica genome to be sequenced.



PestWest®

Flying insect control

THE APPLIANCE OF SCIENCE

Dr Moray Anderson BSc (Hons), PhD, FRES, CBiol, FIBol

Military campaigns at the end of the last century and through into this century's two World Wars, saw various medical officers and researchers linking the widespread morbidity and mortality amongst personnel suffering from enteric diseases with the unsanitary conditions found in camps (Ostrolenk and Welch, 1942; West, 1951; Greenberg, 1973; Levine and Levine, 1991). These poor conditions led to a proliferation of flies, which were observed to pass between latrines and mess tents. In 1899 Vaughan recorded observations of flies crawling over soldier's food with particles of lime attached to their legs and bodies (see West, 1951), he deduced that the flies could only have picked up this lime while feeding on faeces in the camp's latrines.

Thorough studies of the life history of the housefly began at the end of the last century with the work of Howard (see West, 1951). This led to a proliferation of research, much of which has been collated, and added to by West (1951), and furthered by Greenberg (1971, 1973) in his definitive works on the associations of flies with disease. In the last twenty-five years we have seen increasingly sophisticated experiments and studies into the transmission of food-borne pathogens by flies. Research has included case control epidemiological studies, fly population suppression studies and field studies into the transmission of pathogens by flies, which have fed from an infected reservoir (Olsen, 1998).

Since most flies breed and feed in unsanitary conditions, where their larvae feed on decaying organic matter. Female flies choose suitable areas of rotting vegetation and decaying animal matter in which to lay their eggs. Adults emerge from the pupae in these unsavoury sites and in the process can become contaminated with disease-causing agents. The adults then often move into sensitive areas where human food is prepared, processed or consumed, to look for their own food!

In the past 4 to 5 years the pest control industry appears to have seen an increase in the number of complaints relating to small flies often called "drain" flies, fruit flies, fungus flies etc. If their numbers have increased it is likely that the reasons could be linked to the changes in pest control practices?

Pest control practices are changing throughout the world and there is now an increasing emphasis amongst the professional pest control personnel to concentrate on controlling insect pests with precise and directed control measures. In particular the use of toxic insecticidally loaded bait has become the norm in controlling cockroaches.

This is highly desirable and makes for excellent control of the target species but it has had unfortunate and unforeseen repercussions. In the past premises treated for cockroaches were sprayed with an insecticidal spray. This was done with either a flat fan spray nozzle or a crack and crevice nozzle. In either case the premises being treated received a substantial treatment with insecticide. While this was directed at the cockroach population it quite often, because of the nature of the chemical being sprayed, controlled a number of other insect species. In particular, many of the small "nuisance" flies such as owl midges, scuttle flies, fungus flies and fruit flies were controlled in their larval stages by such spray techniques.

The golden rules of flying insect control are:

Identify the insect.

Although this can often be a task for the expert it MUST be undertaken. So much time and money can be wasted when there has not been an accurate identification made of the pest in question. It should be noted that it is not always necessary to wait for the adult to emerge since it is frequently possible to identify the egg, larval or pupal stages of the insect.

Identify where the breeding sites are.

Once the insect has been identified the areas where the various life stages can be found should be sought out. There are many ways that the breeding sites can be altered in order to cause eggs to be damaged, larvae

to be dehydrated or fail to develop and pupae to be destroyed.

Thoroughly survey the premises and surroundings.

A thorough survey of the premises is of course essential, and it is imperative that the surroundings of the building are included in the survey. Keep aware that piles of vegetation, etc. are often foci of infestations. No matter how temporary these areas may appear they can nonetheless be serious sources of problems. The small fungus flies, drain flies and fruit flies can emerge from apparently insignificant areas of debris.

Decide on the most appropriate fly control programme which may involve:

- insecticidal treatment of larval stages
- proofing of the windows and doors of the buildings
- appropriate positioning of electric fly killers

To receive further information on PestWests flying insect centre:

Call: 866.476.7378
www.pestwest.com

Intuitive Pest Monitoring is IPM

Stuart Mitchell, DO, PhD, MPH, BCE

Integrated pest management is a cyclical process that must be synchronous with the biological systems it is designed to control. At the very heart of an effective IPM program is a perpetual monitoring system.

Early detection and interception of pest activity is essential if the relevance of corrective measures is to be optimized.

A concurrent effort of detailed routine inspections and perpetual monitoring using a variety of mechanisms will provide the information to underwrite appropriate control strategies.

The reward to be gained from the use of monitoring mechanisms is time. Organoleptic inspections are consumptive of time and rely upon the skill-set of the inspector. Census monitors such as electric fly killers (EFK), pheromone traps, and adhesive traps communicate trends from a range of locations over a broader time scale.

Monitors can be placed into four main categories; ultraviolet light systems, sex pheromone traps, food attractant traps, and pitfall traps.

Adhesive traps may be employed without baits in order to pick up opportunistic insects within the vicinity. These traps are sometimes referred to as “blunder-traps.”

Catch tray or adhesive trap analysis performa EFKs provides information on the species of insect(s) present, quantity (particularly increases which trigger a modification of control strategy), seasonal fluctuations, plausible foci of infestations, related hygiene or sanitation deficits, and data-sets for trend analysis.

Analysis frequency will depend on the type of site, the potential for contamination, and the contract specifications. Monthly trap counts can be standard, but the period between counts may be adjusted based upon season. High-risk facilities require weekly counts. Monitors must not be placed near open doors where they attract insects into the facility.

Pheromone traps are funnel traps or adhesive traps. The pheromone lures consist of septa dispensers impregnated with a metered amount of pheromone specific to the insect species. Traps are placed in a grid pattern, focusing on high-risk areas to intercept male insects. Delta configuration traps now attract both male and female insect moths.

Lesser adhesive traps have advantage over the larger suspended because their cryptic design allows placement into equipment lines. This allows pinpointing infestation sources. Lures must be replaced at 2, 6, or 12 weeks depending on the molecule.

Aside from fly and wasp traps, which require a liquid bait to attract and drown insects, there are two types of monitors utilizing bait as an attractant.

Adhesive traps using a food attractant pellet or essence (oil may replace the adhesive within stored product insect (SPI) pit-fall beetle trap). Pit-falls do not have the attractive range that pheromone traps posses and insects are generally proximal (thus the “blunder” effect). Pitfall traps are used solely to detect SPIs within stored grain. Such traps can be positioned intracommodity or intercommodity. Crawling insects enter the traps through

downward projected openings and are unable to escape.

Adhesive monitors are exceptionally cost effective as a method of remote detection of insect pressures. Proper monitor deployment renders maximum benefit when checked routinely and replaced as dust or damp conditions contaminate placements. Monitors must be deployed in sufficient number to give adequate spacial coverage since insects have a relatively small spacial requirement.

Regarding rodents, if no infestation is evident, and a risk to non-target species exists, it is recommended to use a non-toxic census bait in a block formulation placed within a bait station. The pest management professional gains advantage by the fact that foraging rats in the area will become habituated to feeding from the bait station and ultimately take subsequent toxic bait that replace the non-toxic. Routine inspection of monitoring blocks is required since a perpetual toxic baiting program must be initiated smartly after detection. A drawback may when used outdoors; non-target species such as field mice may become conditioned to feeding from census sites.

Non-toxic tracking powder can be employed to discern the presence and direction of travel of rodents. Rodents walk over the smooth surface, leaving a clear imprint of feet and/or prehensile tails. Material used should be finely ground and unscented. Flour can be used but a non-food alternative such as China Clay is preferable. A fluorescent version of both tracking powder and baits are available. Traces of the dust anatomically translocated by the rodent are fluoresced when exposed to ultra-violet light from a long-wave ultraviolet lamp.

Like a surgeon who knows exactly what instrument to use at exactly the correct time and in exactly the correct place to save the patient, the pest management professional must know what montoring method and device to use at the correct time and in the correct place to conduct intuitive pest monitoring.

Fly Control Inspection Strategies

How to tackle a fly control problem.

Dr Moray Anderson BSc(Hons), PhD, FRES, CBiol, FIBiol

Identification

The most fundamentally important task associated with any flying insect control program is to identify accurately the fly species that is to be controlled.

So much time and therefore money can be wasted if the fly species is not identified correctly; since the sites of adult and larval activity can vary enormously depending upon which fly is present.

Vulnerable stages

The key to effective control is to pinpoint, within the life cycle of the fly, which is/are the vulnerable stage(s) for control.

Because of the relatively short life of the flying insect egg, it is rarely worthwhile developing a control strategy around the egg stage.

Therefore in general the vulnerable stages of the fly life cycle at which control measures can be directed are the larval stages and the adult fly.

So during an inspection it is vital that the sites which may be exploited by the adults and the larvae should be borne in mind by the inspector so that effective fly control programs can be implemented.

Inspection process

Before entering any premises the inspection should start with a thorough inspection of the surrounding area.

This inspection of the external perimeter of the premises is essential since many of the flies which are found within enter as adults. Their juvenile stages are frequently passed outside the buildings. Therefore for a thorough and sustained control effort the larval feeding sites must be located and treated appropriately.

Before starting out on the inspection it is often extremely useful to ask those working within and around the premises about the actual and/or perceived fly problems. It is vital to recruit the staff as extra pairs of eyes and the information they can give is invaluable.

During an inspection the following points should be considered:

a) What areas of the site may have areas attractive to flies – larvae or adults?

b) Where are the doors to the outside of the building and how often are they open?

c) Are there any possible sources of flying insects in the immediate neighborhood e.g.: farms, chicken-rearing sheds, waste dumps, water courses etc?

d) Does the site which you are inspecting give off an odour that may be attractive to flying insects, e.g.: jam, confectionery, slaughter house, recycling area, etc?

e) Where are the critical areas of contamination within the plant?

g) Make note of areas where there is a lot of rain/ washing/waste water present or likely to be present small “drain flies” often exploit areas such as this.

h) Note where there is screening on the windows or doors, check that they are intact and inquire whether they are opened in hot weather. It is very common to find that they are opened because people believe that screening reduces the flow of cool air.

i) Any area where products are wrapped and packaged is particularly vulnerable and should be carefully inspected.

j) Where are empty containers stored – often empty containers gather dead insects etc.

Find out during the inspection:

1) Why an inspection has be initiated?

2) Has the facility had criticism from another inspector/ auditor?

3) Have they had inspection requirements set by customers?

4) Are there any changes in legislation or codes of practice applicable to the site?

5) Who is responsible for the fly control on the site?

6) When will the corrective actions be incorporated into the hygiene or maintenance program?

Having finished the inspection it is always good practice to be left alone to assess your findings. Do not be rushed into giving opinions or conclusions about what you have found.

Take time when back at your base to research life cycles of the flies you have found and around that develop and outline a control strategy.