

WORK STUDY › OPPORTUNITIES FOR PROFIT

WASTE MANAGEMENT



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BACKGROUND

Landfill and waste management sites can be a source of large populations of flies, which may infest nearby premises in local communities. Studies show that the most common nuisance flies at landfill sites are the common house fly *Musca domestica*, the greenbottle *Lucilia* sp and the blowfly, *Calliphora* sp. Such flies have been implicated in the spread of disease and could be a threat to public health. Furthermore, their nuisance value can be considerable.

Flies infesting local premises may have originated from a number of sources other than landfill or waste management sites and it would be difficult to prove their origin, but landfill and waste management companies often look to maintain favourable relationships with local communities. Therefore, a programme of fly control at landfill sites can minimize disputes with local communities. Importantly, new legislation also highlights the need for fly control.

LEGISLATION

Advice can be found in the Clean Neighbourhoods and Environment Act 2005 (CNEA) guidance notes, available from DEFRA, and the following information is summarised from this source.

The CNEA Act, Section 101 adds to the descriptions of statutory nuisances listed in section 79(1) of the Environmental Protection Act 1990: '(fa) any insects emanating from relevant industrial, trade or business premises and being prejudicial to health or a nuisance'.

Landfill sites / refuse tips and waste transfer premises are listed in the CNEA guidance notes as being possible sites from which nuisance flies may emanate.

Local authorities must take reasonable steps to investigate complaints of such nuisance and can issue abatement notices once satisfied that a statutory nuisance exists.

The complaint threshold density of houseflies at waste management sites may be 150 individuals per flypaper per 30 minutes. The threshold for domestic premises is likely to be very different and there are no objective levels for statutory nuisance, although 25 or more flies caught over a 48-hour period may be considered a nuisance.

So, it follows that an integrated fly management programme at waste management sites is essential in order to comply with the legislation.

FLY BIOLOGY

As a generalisation for landfill and waste management sites, houseflies, *Musca domestica*, tend to be found breeding in decaying vegetable matter and blowflies, *Calliphora* sp and *Lucilia* sp, are found in animal matter such as meat waste. The life cycle from egg to adult for these flies is very similar, taking approximately 4 weeks at cooler temperatures and being accelerated to 2 – 3 weeks in the summer. This rapid life cycle means that housefly and blowfly populations can increase quickly if no action is taken, with 4 – 6 generations being possible each year. Problems can start in early spring, with numbers being highest by late summer.

Breeding is reduced at the onset of cooler weather but the warm environment provided by refuse tips can allow houseflies to continue breeding. The heat of the rotting refuse can further accelerate development so that a single generation of houseflies may be produced in 15 days.

Houseflies are less likely to migrate readily, compared to blowflies. Adult housefly activity is generally confined to the surface layers of the refuse and up to 5cm of air space above the surface, dependent on the microclimate. Although surface temperatures may reach as low as freezing point, temperatures at 10cm from the surface are warm enough to allow development of larvae, which form the basis of adult fly populations that will emerge the following year.

CONTROL MEASURES

Housefly control from 1 to 2km around sensitive sites is recommended and will usually prevent flies entering a sensitive area, such as a nearby housing estate.

If no local breeding area can be found, it is likely that adult flies may be flying a number of kilometres from sources such as refuse tips. Elimination of breeding areas, and good hygiene / sanitation practices are required for effective management. As with all integrated pest management programmes, pesticide treatment is the last option to be considered.

The longer the period of time before the waste reaches its final disposal point (landfill, composting, incineration) the greater the opportunity for fly problems to develop. In recent years the move towards fortnightly collection of domestic refuse, the introduction of a variety of waste processing techniques, and the reduction in the number of landfill sites and amounts of waste have increased the potential for fly infestation.

PHYSICAL CONTROL (LANDFILL)

Physical control includes compaction, milling and the use of covers. Traditionally, landfill sites are required to place a minimum depth of 150mm of inert materials, such as clay, as a cover material on the working face at the close of tipping each day.

Refuse should also be covered with soil or other inorganic wastes to approximately 150mm thickness or deposited together with inorganic wastes to reduce the availability of breeding material.



Covering the refuse minimises the number of adult flies that can gain access to the breeding material on which they lay eggs. Cover also maintains the heat of the refuse, which will kill many of the fly larvae that may be present.

Many flies can be transferred to the site as larvae from domestic refuse, so waste should be bagged up before being placed in the dustbin to help prevent flies from breeding.

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MONITORING

Monitoring and control programmes should be able to minimize most insect nuisance cases that occur. Taking action against infestations in their early stages is crucial, to achieve early management of the insect nuisance.

Landfill sites

Monitoring using fly grids (scudder grids) is important. Scudder grids consist of a wooden grid 60cm x 60cm (the recommended World Health Organisation tool for monitoring flies at Landfill sites).

Scudder grid fly monitoring technique for monitoring flies on waste handling and disposal sites

This method of counting flies is the recommended technique for landfill sites.

Fly counting procedure – taken from ADAS and WHO recommendations

- If possible, the observer selects a group of flies within the monitoring area and the grid is dropped by hand into the cluster, which causes the flies to take off and then land again on the slats of the grid.
- A standard period (e.g. 5 seconds) after having placed the grid on the surface, the flies resting on the grid are quickly counted.
- The grid is then picked up, the observer moves on to the next group of flies, and repeats the operation until a specified number of counts have been done.
- Ideally the counts should be carried out at approximately the same time of day on each occasion.
- Counting very early or late in the day should be avoided as this may give misleading figures.
- Also it is advisable to avoid counting flies during weather which restricts the flies activity.

Waste Transfer stations & other sites

At sites such as waste transfer stations, Mechanical & Biological treatment (MBT) and In-vessel composting (IVC) operators can use adhesive boards to monitor fly numbers. ADAS recommend boards of 200x245mm. These can be attached to posts around the boundary of the site as well as in process buildings. They should be inspected at least once per week on the same day, and the catch for each board recorded.

The limitations are that the boards also catch large numbers of non-pest species, which have to be separated from the pest species before obtaining a final count.

The results can be collated and displayed in graph form

CHEMICAL CONTROL

Landfill sites

Quad bikes often have boom sprayers fitted, to enable insecticides to be applied conveniently. Insecticides are often applied at a pressure of 40psi (2.8bar) onto the inert cover laid over the freshly deposited waste. This creates a layer of insecticide that the emerging flies must move through, or flies attempting to oviposit must land on. As fly larvae may migrate to pupate, insecticide should be applied to the ground 7m in front of the tip.

Alternatively, the insecticide can be applied to the waste before the cover is applied. This can also be a successful method. Treatments are initiated in response to fly monitoring data.

Insecticides should only be used where necessary and insecticide groups should be rotated to minimize the risk of resistance developing.

Waste Transfer stations and other sites

Insecticidal treatments should be initiated in response to fly monitoring data. These can take the form of non-residual fast knockdown such as space sprays and Ultra low volume fogs. Longer term residual treatments may take the form of surface sprays applied to fly contact surfaces. Long-term insecticidal baits are also effective. Where possible insecticidal groups should be rotated and their use kept to a minimum to minimize the risk of resistance developing.

Treatment regimes will depend on:

1. The weather conditions – usually the main breeding period for flies is May to September, depending on temperatures. Prevailing winds may also affect where flies, originating from landfill and waste management sites, are found.
2. Treatments should take place at the end of each working day.
3. Chemicals used may be surface sprays, which are the most common and successful method, fogging chemicals (often used through mist blowers or thermal foggers), which are generally only successful in certain calm climatic conditions and sometimes dusts, as a localised treatment.
4. Chemicals must be approved for use on landfill and waste management sites and it is best to use a broad-spectrum chemical.
5. Sites with a history of serious fly problems should carry out daily treatments, although potential for resistance development needs to be considered. Reactionary spraying is often not sufficient.
6. Ongoing monitoring should also be carried out, particularly if complaints have arisen from local residents.

Treatment should always be carried out by a pest control specialist.

Site size and shape and characteristics will in part determine the level of any fly problems, and how well they are dealt with. Things to consider are:

1. The overall size of the site
2. Any areas where pools of water may collect – these can form areas where mosquitoes etc. can breed in summer months as well as providing damp conditions for houseflies etc to breed in.
3. The active face – is it small or large? Is it steep sided, therefore is access by machines for infilling or application of insecticides difficult.
4. What type of waste does the site take – industrial, domestic?



Other things to consider and which greatly affect the number of flies on site are:

1. How well is the active face covered after the end of each working day? – depth of cover, type of cover, etc.
2. Does material go through a waste transfer station prior to reaching the site and, if so, do they have any insecticide treatments in place?
3. Are fly control treatments being carried out at present – how often? What form do they take?

A list of approved chemicals can be found at the end of this document and further advice can be obtained from the Killgerm Chemicals Technical Department on 01924 268 400.

REFERENCES

ADAS, 1998. *Landfill Sites: Fly control using alternative cover materials and insecticide treatments.*

Busvine, J.R., 1980. *Insects and Hygiene.* London: Chapman & Hall. 3rd ed.

DEFRA, 2005. *Statutory nuisance from insects and artificial light. Guidance on sections 101 to 103 of the Clean Neighbourhoods and Environment Act 2005.*

MAFF, 1979. *Pests on Refuse Tips.* Leaflet 605.

Environment Agency, 2013. *Fly management - How to comply with your environmental policy*

APPROVED PRODUCTS

(PLEASE CONSULT PRODUCT LABELS FOR DETAILS OF SPECIFIC APPROVALS BEFORE USE)

VAZOR CYPERMETHRIN 10

Dilute 25ml in 5 litres of water to treat 100m²
Apply as a coarse surface spray.

Contains 10.17% w/w cypermethrin

SP



AQUAPY

Use 500ml in 4.5 litres of water to treat 100m²
Apply as a coarse surface spray.
(OR use Aquapy Micro as a space spray through the Exodus.
1 litre of Aquapy Micro can treat 30,000m³ for flying insects)

Contains *Chrysanthemum cinerariaefolium* extract 3.00% w/w
(30 g/L) synergised with piperonyl butoxide.

NP



PYBUTHRIN 33

Use 5 litres of RTU liquid per 100m²
(OR as a space spray 50 –250ml / 100m²)
Apply as a coarse surface spray or space spray.

Contains *Chrysanthemum cinerariaefolium* extract 0.37% w/w (3 g/l),
piperonyl butoxide and Distillates(petroleum), hydrotreated light.

NP



VAZOR® PROVECTA

Use 100ml in 5 litres of water.
Apply as a coarse spray or fine mist directly to insects.

Contains Polyalkyleneoxide modified heptamethyltrisiloxane

SP



VAZOR® ULV 500

For use with Exodus and Micro-Gen machines. A synthetic
pyrethroid ultra low volume formulation with excellent
knockdown and low residuality.

Contains 4.4% phenothrin, 0.8% tetramethrin, 7.5% synergist

SP



VAZOR® CYPERMAX PLUS

Use 25ml in 5 litres of water to treat 100m²
Apply as a coarse surface spray.

SP

Contains 10% w/w cypermethrin and 5% w/w tetramethrin.



CYTROL FORTE

Use 1 x 10g scoop of product in 5 litres of water
to treat 125m²
Apply as a coarse surface spray.

SP

Contains 40% cypermethrin



DIGRAIN PERBIO CHOC RTU

Apply as a surface spray or space spray

SP

Contains Permethrin: 0.64% w/w, Tetramethrin: 0.63% w/w



QUICK BAYT

For use on interior structural surfaces of buildings storing
household waste.

NC

Contains 0.5% w/w imidacloprid



NEPOREX 50SP

A novel larvicide to prevent flies developing.
Now approved for fly control on landfill sites.

NC

Contains 50% w/w cyromazine





Sol-Odamask



Exodus®



Nemesis Quattro



Yellow Sticky Boards



Pro Shield Coveralls



Cifarelli Knapsack Mister Blower



Gloria Pneumatic 5 litre stainless steel sprayer



Gloria Knapsack Sprayer

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