



REPORT OF CONSULTANCY VISIT AND SURVEY OF AREA AFFECTED BY FLY NUISANCE on behalf of Chorley Borough Council May 2010



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Submitted to:
Chorley Borough Council

Prepared by:
Barbara Bell
Principal Environmental Consultant
ADAS UK Ltd
11D Milton Park
Milton
Abingdon
Oxfordshire
OX14 4RS

Tel: 01235 438900
Fax: 01235 438909



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1. STATEMENT OF COMPETENCE

I am a Principal Consultant for ADAS Limited (formerly the Agricultural

Development and Advisory Service of the Ministry of Agriculture, Fisheries and Food (MAFF)). I joined ADAS as a specialist entomologist in 1970, advising primarily on problems associated with insect pests of animal units, grain stores, imported and exported foodstuffs, prisons, hospitals and environmental health.

I have a Higher National Diploma in Applied Biology, specialising in entomology and microbiology, a degree in Environmental Sciences, a Masters Degree in Environmental Management and I hold an Intermediate Certificate of Good Hygiene from the Chartered Institute of Environmental Health (CIEH). I am a Member of the Institute of Environmental and Ecological Management.

For the past 15 years I have worked closely with the poultry industry and developed an integrated, tailor-made approach to fly control in intensive animal units which has been recognised by the CIEH as constituting 'best practice'. Between 1994 and 1997, at which time ADAS was privatised, I held a position as MAFF's national specialist entomologist in this field. I am a member of an advisory panel to Defra advising on aspects of the Clean Neighbourhoods and Environment Act (2006) as a nuisance insect specialist. I am currently preparing a Good Practice Guide for Environmental Health Practitioners dealing with nuisance insects, particularly flies, funded by Defra.

2. BACKGROUND

There have been complaints of fly nuisance in the Euxton area of Chorley for the past 2 years, with some complaints received in August 2008 but the main complaints starting in July 2009 and diminishing towards the end of September 2009. In 2009 there were 97 complaints from an area surrounding low lying farmland in the Euxton area.

One resident reported that they had lived there since 1985 and there have always been some flies during the summer months but in 2008 significant fly numbers were noted in late May/early June. These subsided but there was a second smaller wave later in the summer. The problem recurred during May 2009, with further increases in July/August and a final 'plague' in September.

The complainant said that windows could not be left open and scores of flies and maggots were found in the refuse bin when the problem was at its' worst and alleged that increases in fly numbers seemed to be associated with manure spreading on nearby fields that was carried out several times a year starting in early May.

In order to investigate and identify possible sources of nuisance flies and minimise fly problems during the summer of 2010, Barbara Bell, ADAS Principal Environmental Consultant and specialist entomologist visited the area on behalf of Chorley Borough Council on 13 May 2010, accompanied by Lesley Miller, Neighbourhood Quality Co-ordinator for the council.

3. FLY NUISANCE

During any investigation into the causes of fly nuisance it is necessary to determine all potential sources of fly breeding sites that may be present in the local environment. Flies marked with dyes or radioactive traces have been caught up to five miles away in 24 hours and later, up to 20 miles away. In practice, the bulk of flies in towns are unlikely to move more than a mile or two from the breeding source, but flies in open country will disperse more widely in search of human dwellings (*Busvine, 'Insects and Hygiene', p198*).

Houseflies will breed in a large number of substances, traditionally ranging from snuff to spent hops, the only common denominator seemingly being a moist, fermenting or putrefying condition. Typical examples are the excrement of various animals – pigs, horses, calves, poultry, humans; rotting vegetable matter especially with a high protein content, heterogeneous mixtures of rotting household waste such as may be found at landfill sites; garden waste such as piles of grass cuttings; rotting leaf matter as found in field ditches (especially when bounded by trees and bushes that keep the area cool).

It follows that the area surrounding the complainant's properties should be examined for conditions that may provide possible breeding sites or simply be attracting flies to the area. There may be manure heaps associated with stables or dairy farms, sewerage works or landfill sites, allotments or gardens with rotting heaps of old vegetables and fruits, stables, pig farms or dairy units; hop farms with waste heaps. In country areas with no mains sewerage, the poor management of domestic septic tanks or cess pits can be attractive to flies. Simple domestic situations such as leaving dog or cat food in bowls and not clearing away pet faeces from gardens may be attractive to flies.

Further, it is important to examine the disposition of the houses in relation to its immediate environs. Flies tend to gravitate towards sheltered areas and are very often found in shrubby, lightly wooded gardens, particularly when areas of arable land surround them. In an agricultural area predominantly set to cropping with few hedgerows, flies and other insects will naturally tend to congregate in the cooler oasis provided by the garden. It is often found that where, historically, hedgerows have been removed, the fields are surrounded by drainage ditches which tend to remain lush and damp, again providing a suitable habitat for attracting flies which may then breed there.

Invasion of properties by cluster flies must also be discounted. The Stable Fly (*Muscina stabulans*) which is almost identical in appearance to the Common housefly, is also known as a 'swarming fly' in the sense that it tends to aggregate in large numbers, in a similar fashion to cluster flies, prior to hibernation. During the summer months it tends to live out of doors but the muscid flies of which *M. stabulans* is a member, tend to aggregate on the sunlit faces of buildings (particularly those painted white) during the autumn. They crawl into cracks and crevices under tiles and in the eaves, emerging to warm themselves on warm days but their appearances get fewer and fewer as the weather gets colder. This process is reversed in the spring.

Usually the visit to nearby farms would be seen as only the first step on the road to formally identifying and dealing with the cause of the nuisance. The area around the complainant's properties not only has the cattle grazing nearby but has wooded field edges with ditches, a significant number of watercourses and ponds which can all contribute to fly nuisance. Formal identification of the flies causing the complaints must also be carried out by a qualified entomologist at different times of the year as very similar looking flies may be causing problems during different seasons.

In 2008 some samples of flies were taken on two separate occasions and sent to Killgerm for identification. The first sample was identified as *Fannia canicularis* (Lesser Housefly). After the Common Housefly, the Lesser Housefly is the fly most frequently found indoors. It can breed in various forms of moist decaying matter, with poultry manure being a favoured medium. Common in rural areas, the Lesser Housefly is readily identified by its habit of flying in circles beneath hanging objects e.g. below pendant lights. The habits of the Lesser Housefly rarely bring it into contact with human food.

The second sample was identified as *Anthomyiidae spp.* These closely resemble the Lesser Housefly and can only be distinguished from them by close examination of the wing venation. Commonly called 'root flies' or 'root maggots' the adults are often found on flowers in moist or wooded habitats and are also common in fields feeding on nectar and pollen. They are important pollinators of plants. Most of the larvae are phytophagous, feeding on roots (as their common name suggests), but some are saprophagous, and a few are parasites of grasshoppers, hymenoptera, reptiles, and burrowing mammals. They are not usually attracted into properties but can often be found hovering outside.

3.1. Rural flies

There are over 6000 species of British flies and two publications (Colyer, C.N. & Hammond, C.O. 1951, *Flies of the British Isles*, Warne and Oldroyd, H. 1964, *The Natural History of Flies* Weinfield & Nicholson) were used to draw up a table of flies that may be found in this typical rural location and time of year when they are at their peak. The behaviour of the different species will determine their preferred habitats and the likelihood of their being found as a nuisance in houses.

Type	Location	Time
Ptychopteridae – 7 spp	Low vegetation near water or in damp situations	May to October
Scenopinidae – 3 spp	Windows of old houses, stables and outhouses	Spring – autumn
Campsicneminae	Surface of pools and sluggish ditches	Summer
Chrysosomatinae	Foliage of hedgerows	Summer
Phoridae	Dead snails, fungi, milk-curd in neglected milk bottles, human excrement, cheese conc. soap solution, any decaying animal or vegetable matter.	Spring - autumn
Platypezidae – 23 spp	Hovering near low plants or under the branches of trees. Smoke bonfires(BBQs?)	Summer
Syrphidae 250 spp	Grass around dung pats, buttercups and Marsh marigolds, rotten fungi, nettles and low plants	Early spring until late autumn
Group I		
Group II	Wasp nests	Summer
Group III	Decaying organic matter, gutters, neglected water butts, accumulated rubbish, ponds near farmyards, muddy ditches, waterside foliage	Spring-autumn
Group IV	Boggy moors, dung, compost heaps, rotting vegetation, rotten wood, poplar and beech trees	Summer
Group V	Rare	
Group VI	Ants nests	Summer
Conopidae	Hawthorn, brambles	June – August
Myopinae	Outskirts of woods, hawthorn, brambles, umbels, dandelions, thistles etc	May – September
Platystomatidae 2 spp	Low plants, nettles, shady and damp places	May-June
Pallopteridae 9 spp	Thistles, gardens, windows in suburbs	Summer
Tephritidae 70 spp	Garden flowers	Summer
Sepsidae 23 spp	Carrion, decaying organic matter, excrement, farmyard manure, drain channels from pig sties or stables	Summer

Type	Location	Time
Piophilidae 9 spp	Animal protein foods such as cheese and bacon	Summer
Psilidae 29 spp	Root vegetables in gardens	Early summer
Lauxaniidae 50 spp	Shady vegetation in damp places	Early summer – late autumn
Sciomyzidae 50 spp	Slugs and snails	Summer
Tetanocerinae	Marshes or slow streams	Summer
Neottiophilidae	Birds nests	Summer
Thyreophoridae	Carrion	Summer
Chamaemyiidae 13 spp	Damp places near streams	Late spring – autumn
Heleomyzidae 60 spp	Rotting potatoes, rotten wood, cess pits in rural areas, rabbit burrows	Summer
Heleomyzina	Cow dung	Summer
Chyromyidae 5 spp	Windows indoors, shady vegetation in damp places, guano	Spring – autumn
Anthomyzidae 16 spp	Grasses bordering streams	Spring – autumn
Ephydridae 120 spp	Near water and marshy places	Year round
Sphaeroceridae 100 spp	Cow pats and other mammalian dung eg. horse, rabbit, rodents	Year round
Drosophilidae 52 spp	Fruit stores, beer, cider, vinegar, pickles, kitchens	Year round
Oscinellinae	Barley, wheat, rye, maize, oats	April – August
Chloropinae	Cereals	Autumn swarms
Scatophagidae 50 spp	Some dung feeders	Summer
Hydromyzinae	Waterlilies	Summer
Dexiinae	Low vegetation, woods	July – September
Calliphoridae 90 spp	Carrion, decaying matter,	Early spring – autumn clustering
Hypoderma	Cattle, sheep, horses, mules	Spring – autumn
Muscidae 450 spp Muscinae	Excrement and decaying matter	Early spring – winter
Phaoniinae	Tree trunks, fences, human sweat, dung	Early spring-winter
Mydaeinae	Near water	Summer

4. SURVEY

Visits were made to a number of properties and farms in the affected area.

The weather at the time of the survey was warm and sunny, with a light wind.

4.1. Mr Wood Peartree Farm

These premises comprise a number of stables and the horse manure is stacked in a large pile at the entrance. The premises have been inspected previously by the EHOs who are aware of the practices employed at the site. It was decided that as Mr Wood is an elderly gentleman and may be upset by another inspection that only a cursory visit should be made. The stable yard looked to be in good order.

4.2. Buckshaw Village

Lesley Miller drove around and described this newly developed area which was formerly a Ministry of Defence site which had housed large bunkers etc. there are also 2 landfill sites (one within Buckshaw Village and one just to the north at Clayton Hall) and commercial office blocks. A large industrial estate and housing development are still under construction on this large site.

4.3. Mr Hill Culbeck Farm

Mr Hill farms the land which is adjacent to the complainant's properties. He has a dairy herd with associated milking parlour at Culbeck Farm. A full examination of Culbeck Farm showed it to be well maintained, however there is considerable potential for fly breeding with a slurry lagoon and open weeping wall for manure storage.

There are a number of flies associated with dairy cows, particularly Stable Flies (*Muscina stabulans*) (mentioned above as a summer swarming fly), and the Common Housefly (*Musca domestica*). World-wide in its distribution, the Common Housefly is closely associated with human dwellings and is readily attracted to fresh horse dung, pig, cattle and poultry manure. They prefer to lay their eggs on manure exposed to light. The adult fly favours resting on rough areas, edges, corners, around creeps in farrowing houses, in calf pens, around light switches and is readily attracted to sources of high carbohydrate foods.

Mr Hill told us that he spreads the fields with lime and poultry manure from a free-range unit but cannot get onto the fields when they are wet. He does not graze animals on the land at Euxton during July and August because the land is low lying and damp and the cattle get badly bitten by the flies that are attracted to this type of land.

4.4. Mr Parr, Fairview, PearTree Lane

Mr Parr said that he had suffered considerable problems in 2008 and 2009 with large numbers of flies being present in and around his property.

The house is close to the land farmed by Mr Hill but also has additional agricultural land on the other side of the lane. There are ditches, streams and ponds in close proximity along with damp copses of trees and lush pastureland. A new development in School Lane has been built with a landscaping plan which includes several ponds.

2 uncovered stockpiles of manure were found in gateways during the investigation carried out by the EHOs in 2009.

Mr Parr expressed the belief that the fly problems are associated with manure spreading on Mr Hill's land.

4.5. Mrs Warhurst, 64 School Lane

Mrs Warhurst described the severe problems that she suffered in 2009 with large numbers of flies (species unknown) sheltering under the east facing sloping ceiling of her kitchen extension which was under construction at the time.

This is a common phenomenon with many flies which are attracted to cool spots where they can shelter from the afternoon sun.

4.6. David Staveley, Coppull Moor Farm

A visit by Barbara Bell had been made to Coppull Moor Farm in 2005 on behalf of Chorley BC in order to advise on Best Practicable Means for fly control in deep pit caged egg production units.

Since then all deep pit caged units have been replaced with belt clean multi-age enriched cage units. The manure is removed from these units twice a week and put into one of two specially built manure stores. The manure is then removed for immediate spreading to fields at the appropriate time of year but can be left in the store for many months if needed where the heat generated causes it to compost.

The benefit of the belt clean system is that as the manure collects on the belts beneath the birds it is quickly dried using the natural ventilation to below the moisture content that is suitable for fly breeding. The units are also virtually inaccessible to ingress of flies, further reducing the opportunity for fly breeding. The lifecycle of Houseflies is temperature dependant and during the summer months this can be as short as 7 – 10 days. The manure from these units is removed twice a week which is considerable less time than is required for completion of the fly life-cycle. I regularly audit egg production units of all systems and size and have never had to deal with a problem of fly nuisance associated with a belt-clean unit.

A single age free-range egg production unit is now also in operation on the site. These units had a Neporex (insect growth regulator) application at the start of the flock and are mucked out in April/May.

Although free-range units are not known to cause nuisance fly problems they are very attractive to Lesser Houseflies which congregate in the entrances where they circle aimlessly in large numbers. Half-dose applications of Neporex at monthly intervals during warm weather through the slats of the shallow pits will ensure that any fly eggs that may be laid cannot develop into adult flies.

4.7. John Coulthurst, Altcar Farm

This farm is on the border of Chorley BC and South Ribble Borough Council and was inspected by Barbara Bell on 12 May 2010 accompanied by Mike Shaw of South Ribble BC. Mr Coulthurst has previously been visited by Chorley BC during their investigations. The information gathered on 12 May 2010 is reported here for completeness as the manure from the units is often spread in Chorley BC.

He currently has both free-range and deep-pit units. To prevent the fly problems often associated with deep pit units I was told by Mr Coulthurst that he empties the manure from the pits twice a week during summer months. The manure goes to other farms in the area and is loaded straight into manure spreaders and is taken for immediate spreading onto fields. By only allowing the manure to leave the farm in spreaders it ensures that the farmers cannot stockpile the manure on the sides of fields where it would be an attractive medium for fly breeding.

After 31st December 2011 it will be illegal to sell eggs from battery cages hens in the EU so gradually deep-pit poultry units are either being closed down as the flocks are being depleted or they are being converted to belt-clean enriched cage colony units. House 2 at Altcar Farm is being depleted in July 2010 and House 3 in May 2011.

The standard techniques for achieving Best Practicable Means for fly control in deep-pit poultry units can be found at Appendix 1 and details of how to deal with manure that cannot be spread to land because of recent treatment with Neporex is found at Appendix 2. These systems should be adopted by Mr Coulthurst if he cannot remove and dispose of the manure on a weekly basis.

Common Housefly (*Musca domestica*) are usually the species of fly associated with these deep-pit units, (also cattle and pig manures) and Lesser Houseflies (*Fannia canicularis*) are more usually associated with free-range units.

5. CONCLUSIONS

The fly complaints centre on an area of land that is low lying, damp, lush and surrounded by trees.

There is circumstantial evidence that the fly problems may be associated with spreading of manure/slurry onto some of these fields.

There are a number of animal units in the area that supply this manure. At the time of the visit all appeared to be well run and the owners aware of the need to manage the manures produced to prevent fly breeding.

It has been recognised that stockpiling of these manures on the sides of fields (or in nearby gateways) can cause fly problems in the immediate area, either because the manure was infested with fly larvae/pupae when dumped or because uncovered piles of manure are very attractive to flies that may occur in the wild.

The only type of nuisance flies that have been formally identified are Lesser Houseflies and *Anthomyiidae spp.*

6. DISCUSSION

All the complainants' houses are surrounded by trees, ponds and streams fed and drained by very slow moving shallow ditches which are often full of leaves and rotting vegetation and overhung by trees.

Whilst poultry manure is recorded as the favoured breeding medium for Lesser Houseflies they are known to breed in a myriad of types of rotting organic matter including other animal manures and compost heaps.

Lesser Houseflies overwinter as pupae in damp soil and with the very mild winters that were being experienced meant that Lesser Houseflies may have been able to survive in these areas to emerge in the spring and cause nuisance in nearby properties, particularly in areas where the air is still and warm such as porches, car ports and open garages. These are places where similar conditions to those found in the entranceways of the poultry houses, another area to which these flies are attracted.

It should be noted that the weather conditions in the late spring, summer and autumn of 2007 and 2008 resulted in a significant increase in fly numbers across the country with large numbers of both Common Houseflies and Lesser Houseflies being reported from areas where problems have not been seen before. Not only are flies attracted to properties by food but they search out cool, shady places to shelter from the heat. Residential houses, especially with porches or dark kitchen areas seem to have been badly affected during hot weather.

I have investigated a number of cases of explosions of Lesser Houseflies that occur at the end of July, through August and into early September but which have not had a specific source. If the hypothesis of their breeding in the wild is true it will be interesting to see if this phenomenon occurs in 2010 after the very cold winter that was experienced in 2009/10. Theoretically the numbers that should have been able to survive should have been very much lower and the subsequent annual explosion should not occur to the same extent.

Although a number of residents have complained about fly nuisance at their properties it is not known if they have been advised of the steps that they can take to minimise the nuisance.

A number of precautionary measures can be taken in the domestic situation to minimise/discourage the presence of nuisance flies and other insects. These include:

- Keeping all external refuse areas and receptacles as clean and tidy as possible.
- Any waste organic items, likely to attract flies or other insects, should be drained and wrapped before placing into these receptacles (paper wrapping is preferred since this will decompose, although plastic can be used if necessary).
- All such receptacles should be cleaned regularly and provided with close-fitting lids, kept closed at all times, and placed as far away from the dwelling as possible.
- Remove or relocate all potential breeding material such as rotting vegetation/fruit or mulch, including old, wet lawn clippings or accumulations of damp leaves etc.
- Remove and bury any animal excrement, animal or bird carcasses.
- Avoid leaving pet foods outside.
- Any piles of compost should be covered and placed as far away as possible as the warmth they generate attracts flies and other insects.
- Eliminate any pools of standing water by ensuring efficient drainage or surface grading. Drains must be kept clean and clear of accumulated waste.
- Mesh screens can be used on windows and doors in order to significantly reduce the numbers of insects entering the premises. Plastic, aluminium chain or bead curtains can be used if the opening provides an access route.

During other surveys of villages where flies have caused nuisance I have noted that flies are attracted to well-sheltered gardens, particularly those with ponds and/or Leylandii hedges. The following may be considered to help alleviate the situation:

- Possible removal or trimming back of vegetation from the immediate surrounds of property entrances.
- In the light of improved conditions (warmer and wetter summers and milder winters) for fly breeding nationally, consideration should be made to proofing premises where they are a particular problem. Fly mesh at the windows and mesh, plastic or aluminium fly screens at doors which swing shut automatically will all assist in excluding flies from kitchens, lounges and bedrooms.
- White painted houses, light patio stones, ponds and thick hedges – all of which are common in rural gardens – will increase the number and types of flies that are attracted to properties. Thinning of hedges has been shown to dramatically reduce fly numbers in gardens.

7. RECOMMENDATIONS

The most important factor to be considered when investigating any case of nuisance flies is to ensure accurate identification of the flies causing the nuisance.

These may be different species at different times of the year so it is important to ensure that a number of different samples are examined whenever the problem occurs. Similarly the problem experienced in one premise may not be the same as the problem experienced in others.

- It is recommended that a few of the complainants are approached with a view to installing tear-down rolls of sticky papers in vulnerable areas such as kitchens or any room where they have caused problems in the past. The rolls should start to be used if an increase in fly numbers is noticed and the rolls should be changed each week and at the end of the week the number of flies should be counted and recorded and the strip replaced .

Should numbers of flies suddenly rise the strips should be counted, covered in cling film, then sent to Mike Lole at ADAS Rosemaund for identification. This will enable the potential source of the problem to be narrowed down.

At the same time inquiries should be made as to any local activity that may have taken place such as muck spreading, harvest, the turning out of stock, depletion of poultry flocks, dredging of streams or ponds etc.

- Farmers in the area are now aware of the need to manage their manure more carefully and that stockpiling on the side of fields can result in local cases of fly nuisance. They should be reminded that manure applied to arable land must be ploughed in within 24 hours of spreading. Manure applied to grazing land should be applied in accordance with the agricultural Code of Practice and that if there is a need for stockpiling then the manure should be sheeted during the storage period and the sheet secured by eg. sand snakes.

A copy of the draft Code of Practice for the spreading of Manure is attached at Appendix 3 for information.

APPENDIX 1 - PROGRAMME FOR MONITORING AND CONTROL OF FLIES IN DEEP PIT POULTRY HOUSES

(RECOGNISED AS CONSTITUTING 'BEST PRACTICE' BY THE CIEH)

Monitoring

Each house should have at least 6 monitoring squares marked out along the inside walls and on the undersides of the walkways. The squares should be 1 metre by 1 metre and marked out with white paint. They should not be solid squares of paint but a border effect on the blocks, to ensure that no attractant/repellent effect influences the counts.

Six sites should be designated for examination of the manure for fly larvae. These should be clearly indicated on adjacent pillars and concentrated near the pit ends where fly breeding tends to be concentrated.

Twice-weekly counts of adult flies on the wall/ceiling square and larvae in approximately $\frac{1}{2}$ metre square marked areas, should be carried out and recorded on the forms supplied.

A rough guide to the larval assessment is 0 \equiv 0 larvae, 1 \equiv 5% of manure covered by larvae, 2 \equiv 10%, 3 \equiv 20%, 4 \equiv 30%, 5 \equiv 40%.

CONTROL TREATMENTS

April - October

Neporex (cyromazine) treatments should be carried out when the average count is 2. Spot treatments may be used if larvae are found in isolated areas e.g. sites of leakage. The width of peak to be treated should be assessed and amount of Neporex needed calculated using the attached sheet. $\frac{1}{10}$ th of the whole dose should be applied every Monday, Wednesday and Friday for a 3 week period.

A **targeted** knock-down spray may be applied each Monday prior to treatment.

This should form the main thrust of your fly control campaign as Neoprex will break the life cycle. Neporex should be applied throughout the winter months to the inaccessible areas of the scraper boards every 2 weeks if fly problems persist.

QuickBayt (imidacloprid) or Spy (spinosad) on white (preferably) boards or A4 size sheets of cardboard should be hung throughout the pits. A large number (100 plus) of small cards (0.3 m square) are better than a smaller number of large boards. The bait should remain granular in appearance when the boards are dry. As the number of adult flies fall, less bait will be taken from the boards and, providing the granules remain clean and visible, they can remain toxic for up to 3 months, however their pheromone effect is reduced after only 2 weeks. Spy is not as quick acting as QuickBayt so it may appear that it is not as effective as the flies do not drop dead immediately beneath the treated areas but tend to fly off and die a short time later.

Oxyfly (micro-encapsulated lambdacyhalothrin) residual spray should not be used as resistance will quickly build up in the enclosed environment of an intensive egg production unit.

The use of the Aeroxon and Rentokil sticky papers should be considered in areas where adult flies are known to congregate, such as the pit ends and around feeder hoppers. Sterling fly traps or Red Tops are useful outdoors.

November - March

A few strategically placed bait boards and sticky traps should be sufficient over the winter months to control any adult flies which may emerge. Residual sprays may be also be used but should only be applied to clean areas or applied on cards. Summer treatments may be more usefully employed.

Weekly counts for adult and larvae presence to be carried out.

Hygienic must play a large part of control, and water leaks must be prevented. Eggs, dead and live birds, insecticide packets etc. should be removed immediately, or better still, not put in the pit in the first place. All ledges where muck collects should be scraped off weekly.

Sticky traps and insecticides board should be checked weekly and replaced if they become dusty, dirty or ineffective because of lack of insecticide. They should be removed from the houses and burnt.

Care should be taken at all times to ensure no insecticide is inadvertently applied to the manure. Space-sprays should be used as an emergency action only.

To ensure that system adherence is maintained by staff carrying out the monitoring and control it is recommended that the records be independently monitored by an ADAS specialist consultant at least 4 times between the months of April and October. These should take the form of 'spot checks' (staff should not be told that the consultant will be visiting), The inspection should comprise examination of the records and checking on the standard of fly control at the time of the visit. It should be followed by a report to the manager in overall charge of the sites.

GOOD RECORD KEEPING is essential and forms the foundation of any form of pest control. If the person in charge of control is absent, a deputy will know exactly what has been done and how to continue the regime. Any queries concerning control can be quickly answered and trends marked and acted upon.

Barbara Bell

Principal Environmental Consultant

PROCEDURES TO BE ADOPTED AT MANURE CLEAN-OUT

1. Muck infested with fly larvae and/or fly pupae, should not be removed from the house, particularly during warm weather. If routine inspections indicate significant levels of maggots are present, the manure should be treated with Neporex at least four weeks prior to removal. This action will kill off early stage larvae but not those in the later stages of development or the final (pupal) stage which will continue to develop into adult flies. The larvicide treatment must be supplemented therefore with the use of sticky traps, knock-downs and baits to 'mop up' emerging adults.
2. Prior to the end doors being taken off for manure removal a full treatment with a knock-down spray should be applied *if necessary* in both the pit and the bird area to prevent adult fly emergence.
3. Some 'old' manure should be left behind at cleaning if no flies are present to assist in the rapid-establishment of predacious beetle and mite populations. If no beetles are present in the house, complete clean-out should be followed by 'seeding' with beetles from infested houses providing that there are no biosecurity risks on the site. Complete clean out and seeding with beetles should also be adopted if fly breeding is occurring in the pit.
4. As soon as fresh muck heaps begin to develop routine inspections should be made at least twice per week. At the first sign of larval development the muck should receive a full treatment of Neporex in accordance with the manufacturers instructions. It is essential that the larvicide is applied at an early stage because the later stage larvae and pupae are not susceptible to the material.
5. The need for Neporex re-treatment and/or additional insecticide treatments will depend on the nature and extent of the individual problem. All treatments should be recorded on the appropriate form supplied.

APPENDIX 2 - NEPOREX USE IN DEEP PIT POULTRY UNITS AT DEPLETION

The label details for Neporex, which are legally binding under the Food and Environment Protection Act (Control of Pesticides Use) 1986, state that manure treated with the product must not be spread to land within 4 weeks of the final application. The product specifically prevents 1st and 2nd instar fly larvae from further development and will also have this effect on wild populations of flies that lay their eggs on the land to which the manure is spread. It will not prevent 3rd instar larvae from pupating and ultimately emerging as adult flies.

If birds are depleted (removed from the caged units) but the Neporex treated manure is left in the pit because it cannot be immediately spread due to this time constraint, any adult flies that emerge during the time before removal and spreading (max. 4 weeks) can be killed by the presence of bait boards covered in adulticides which will be in the pit as part of the routine control measure and regular spraying with knockdowns.

The primary reason for not using knockdown sprays in the pit during the life of the flock is to ensure that the beneficial beetles are not killed by fallout of these products onto the manure. Additionally prolonged use may lead to resistance to these products in the fly population. Once the birds are out and the manure is simply waiting to be spread there is no longer any need to maintain high populations of beneficial beetles as they will be removed from the pit with the manure. Regular use of knockdowns over a few weeks won't affect the resistance levels in the fly population. Hence regular (daily if necessary) knockdown treatments can be carried out to kill any adults that may have emerged and also reduce the potential for egg laying.

The Neporex that has been applied will continue to prevent the development of any larvae that hatch out in the meantime as it is not being covered by additions of manure from the empty cages above.

Retaining the manure in the pit will allow any pupae to hatch and the adults to be killed within this enclosed environment and the manure to be fly free by the time it is removed.

Barbara Bell

ADAS Principal Environmental Consultant

APPENDIX 3 - DRAFT CODE OF PRACTICE FOR THE USE OF (POULTRY) MANURE

Working Document

Introduction

The formulation of this Code of Practice (COP) has been prompted by the recurring problem of fly infestation often associated with the use of poultry manure within a number of local authority areas. The intention of the COP is to provide a consistent approach to the way in which the participating local authorities will deal with problems associated with the use of poultry manure and the manner in which they will expect it to be used.

The primary goal of the COP is to address the issue of fly infestation and to prevent problems before they occur by working in partnership with those involved, rather than to take enforcement action against individuals after the event. It will also deal with the issue of odour control where possible.

It is hoped that the COP will be of benefit to all parties who are involved in the use of poultry manure including:

- producers who need to ensure that their product is of good quality and poses the minimum risk of causing a problem when used.
- transporters who need to ensure that manure is transported and deposited in a responsible manner for use.
- users who must ensure that manure is stored and used in such a way as to minimise the potential for problems to be caused, and
- the general public who are affected when fly infestations occur.

The participating Local Authorities would like to work with the various groups involved to prevent the recurrence of what is a significant issue causing both nuisance and potential health risks to large numbers of people.

While maintaining the desire to work with those people involved in the production and use of poultry manure, the participating Local Authorities will consider a failure to follow the COP as evidence in any enforcement action.

It is the common intent of the Local Authorities participating in this COP to take robust enforcement action against any company or individual who is identified as having caused infestations of flies to any location within their respective areas of authority.

In order to address all aspects of the use of poultry manure the COP is divided into sections, each of which is focused on a particular element of the use/disposal of poultry manure.

Producers

It is important if fly problems are to be prevented that manure supplied is of the best possible quality in terms of fly and maggot infestation, It is also important that manure supplied is capable of being stored in such a way as to prevent it causing a problem with flies.

- manure should be as dry as possible before it is allowed to be taken for use. This makes it difficult for flies to breed and also allows it to be stored in a manner which enables it to be covered more easily. A level of at least 50% dry matter is desirable and 30% dry matter should be the minimum. Manure with a dry matter content below 30% should not be supplied unless satisfied that it will be used and incorporated immediately. If the manure is to be used on pasture or for top dressing a growing crop, it is essential that it is applied only in small droplets that will either dry out or be taken into the soil very quickly. If it cannot be used it must be stored within a manageable facility and not a field store.
- regular inspections of poultry houses should be made to identify any infestations of maggots or flies at an early stage so that they can be treated as quickly as possible. A monitoring and treatment process should be implemented and good records maintained to show what has been done. Research of ADAS approved schemes suggests that one way of monitoring the level of fly and larval activity is to use a grid system. The use of ADAS endorsed schemes may be used to demonstrate 'Best Practice'.

- a number of monitoring squares, (six for large houses) are marked out along the inside walls and the undersides of walkways. They should be 1 metre by 1 metre and marked out with white paint to form a border. A count of flies on the wall and ceiling squares should be made on a regular basis at all times and twice weekly during the summer months from the beginning of May until the end of September.
- there should also be six designated areas where maggot activity is monitored. These should be approximately 0.5 metre square areas which are intrusively investigated. A rough guide to larval assessment is 0 = 0 larvae, 1 = 5% of manure covered by larvae, 2 = 10% of manure covered by larvae, 3 = 20% covered by larvae, 4 30% of manure covered by larvae, 5 = 40% of manure covered by larvae. Treatment of the manure should be triggered at index 3 and no manure should be taken from the house if two or more larvae are counted.
- the use of sticky traps and indicator boards is also recommended and these should be monitored and changed regularly.
- it is recommended that all staff receive suitable training to enable them to effectively monitor and treat any infestations.
- manure should not be removed if it is infested with larvae and full treatment of any manure that routine inspection shows to be infested should be completed prior to its removal. This may take up to four weeks to be completely effective so forward planning is essential.

Transporters

When transporting manure from its point of origin to the place where it is delivered, it is important that every care is taken to minimise the impact that it may have on residential areas during transit. It is important that the manure is not transported unless it is of sufficient quality. It is also important that when the manure is delivered to the end user it is done so in such a way as to enable it to be stored/covered if necessary at the end of each day. It is the responsibility of the haulier to ensure that:

- manure which does not have a minimum content of 30% dry matter is only transported in suitable vehicles which are designed for the purpose.
- trailers are not overloaded allowing manure to be spilled onto the highway.
- trailers should be covered if practical, particularly if moving more than short distances or through residential areas.
- manure is delivered in such a way as to enable it to be easily covered. Experience has shown that narrow rows or 'windrows' of manure are more easily covered.
- the recipients are aware of this COP and their responsibilities to observe it.
- that the recipient of the manure has made provision for covering the manure if necessary. The manure should then be covered at the end of each day of delivery.
- delivery should only be made if the contractor is satisfied that the recipient is aware of the COP and their responsibilities under it. Delivery should not be made if the recipient is unable to ensure that the manure is adequately covered, should this be necessary, and should be returned to its point of origin or other suitable storage facility.

It is also important that care is taken to prevent mud being deposited on the highway as this can pose additional dangers to other road users. When necessary, signs should be posted to alert drivers that there may be mud on the roads and this should be cleared up as soon as possible. Depositing mud on the highway is a breach of the Highways Act 1980.

Storage

Recent experience has shown that the storage of manure is one of the most important factors in preventing fly infestations. It has been seen that even manure that is produced, transported and delivered in a dry, fly free state can in some cases become infested and cause problems. It is important when manure is delivered and is being stored without covering because it has been supplied in a fly free condition, that the pile is monitored by the recipient on a frequent basis at least three times per week to ensure that there is no fly activity. At the first sign of fly activity the manure should be covered. It is therefore essential that recipients of poultry manure have stocks of suitable sheeting material before receiving the manure so that it can be used at very short notice. During the summer months from the beginning of May to the end of August recipients storing manure near to residential areas should consider covering the manure if storing for more than a few days, as the covering will also help to prevent any odour nuisance from occurring. While it is important that manure is stored in such a way as to prevent fly nuisance, care should also be taken to ensure that other codes of practice designed to protect land and watercourses are observed.

Although it may not be necessary to cover all piles of manure, the potential for problems to occur is increased during the summer months from the beginning of May to the end of September. During this time users of manure may wish to take a 'safety first' approach when deciding whether a pile of manure needs to be covered.

When storing manure it is the responsibility of the recipient to ensure that:

- any piles of manure that are not covered on delivery must be inspected frequently and at least three times per week for signs of fly infestation and a record kept of these checks for examination by the Local Authority. At the first sign of fly activity on or around the pile the manure must be covered immediately.
- all stored manure that needs to be covered is covered at the end of each day of delivery to prevent flies migrating to or from the pile. This will serve to reduce the odour emitted during storage, prevent flies infesting the manure and raise the temperature inside the pile to a level which will kill any flies or larvae which are already inside. It will also help to prevent the potential for odour nuisance to any nearby residential premises.
- the manure should be deposited between two pre-prepared earthen ditches or bunds in narrow rows or 'windrows'.
 - the manure should then be tightly covered with polythene in such a way as to leave no gaps. Suitable polythene can be obtained from most agricultural suppliers.
 - the edges of the polythene should then be buried in the ditches by back filling to prevent flies escaping and to prevent the wind from removing the sheeting. Experience has shown that simply weighting down the sheeting is not effective and will not be considered satisfactory. The piles of manure should be checked every four days at the minimum by the recipient to ensure that there is no damage to the polythene. Damaged polythene will need to be replaced.
- all manure that needs to be covered in this way should remain covered for a minimum of ten days before it is used or until it is used to ensure that any flies or fly larvae are killed and the pile does not become more infested.

- avoid putting storage piles next to dwellings, places of work, popular leisure areas etc.
- manure should be stored on level ground to avoid run off.
- do not store manure over field drains or within ten metres of a watercourse.

Spreading

The spreading of manure has been associated with a number of fly infestations in recent years, even where it has been demonstrated that the manure used is free from infestation, It is recognised by independent entomologists that the odour given off during spreading can attract naturally occurring populations of flies and causes them to artificially concentrate and increase in numbers. When spreading poultry manure it is important that the following steps are taken:

- manure should be incorporated by deep cultivation within 24 hours of spreading. This is in accordance with the DEFRA Air Code 1998 and will minimise odour emissions and prevent access by flies that may be in the area.
- when spreading on pasture, only manure that is free from flies and larvae and of low odour should be used. Animals should not graze fields until the minimum time period recommended by ADAS has passed. Care should also be taken that other DEFRA Codes of Practice for protection of soil and water are followed and that manure is not over-applied. (Spreading of manure which has been delivered and stored before spreading will be deemed to be the responsibility of the farmer and not the producer.)
- manure should not be applied to ground that is waterlogged, flooded, frozen hard or snow covered, It should not be applied within ten metres of ponds or watercourses.
- the spreading of manure on Bank Holidays and Sundays should be avoided.

- operators should make every effort to remove mud and manure from the tractor and trailer/spreader wheels before driving on the highway.

Notification

The intention of the COP is to prevent as far as possible further incidents of fly infestation in the areas covered by the participating Local Authorities. The success of the COP needs to be monitored so that problems can be identified and alterations made if necessary. In order for this to be effective it is vital that the participating authorities know where and when poultry manure is to be stored and spread. The persons in the best position to provide the required information are the people transporting the manure and the people taking delivery of the manure. It is also important that producers keep records of where manure is being taken when it leaves their farm which can be made available to Local Authorities upon request. When an order for poultry manure is placed for delivery within any of the participating authorities:

- the transporter shall notify the relevant Local Authority Environmental Health Department by fax, phone or e-mail on a weekly basis of the locations, name of recipient and date of delivery of poultry manure from the previous week.
- the Local Authority shall be notified at least 24 hours before the spreading of previously field stored manure takes place.
- the producer shall keep records of the intended delivery address of the manure. These records shall be made available to Local Authorities for verification upon request.
- notification should be in the form of e-mail or fax or telephone. The required e-mail addresses, fax and telephone numbers can found attached to this COP.