Fly Breeding Associated with Horticulture and Livestock

This pamphlet contains information on how to identify flies, assess levels of fly breeding and ways to control fly breeding. It is a guide for Authorised Officers, horticultural growers, livestock producers and landowners.

NUISANCE FLIES COMMONLY ASSOCIATED WITH MANURES AND ROTTING VEGETABLE MATTER

- *Musca domestica* (HOUSE FLY)
- *Muscino stabulans* (FALSE STABLE FLY)
- *Stomoxys calcitrans* (STABLE FLY)
- *Fannia canicularis* (LESSER HOUSE FLY)
Fly Life Stages

Average Size of Fly Life Stages

<table>
<thead>
<tr>
<th>Life Stage</th>
<th>Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGGS</td>
<td>2-3</td>
</tr>
<tr>
<td>LARVAE, 1st instar</td>
<td>2-4</td>
</tr>
<tr>
<td>LARVAE, 2nd instar</td>
<td>5-8</td>
</tr>
<tr>
<td>LARVAE, 3rd instar</td>
<td>10-15</td>
</tr>
<tr>
<td>PUPAE</td>
<td>6-10</td>
</tr>
</tbody>
</table>

Eggs

Larvae

Larvae in manure

Poultry manure stack/heap

Vegetable waste fed to livestock

Surface dress: manure to cotton

Sideband application of poultry manure

Preplant application of poultry manure

Spilled and contaminated manure
The Cycle

Pupae

Adult fly

Empty (spent) pupal case

Fly ovipositing

Sources of Fly Breeding

Horticulture and Livestock

D
Piled horse manure + straw

E
Trashed crop

I
Piled lawn clippings

J
Rotting vegetable pit
How to Assess Fly Breeding

1. Inspect sites where fly breeding may occur (see pictures left and below), especially where moisture is present. If any fly life stages are found (i.e., fly eggs, larvae, or pupae), then sample as follows:

2. Using a garden trowel, take 6 samples of the breeding material from random locations (for example, within a 5ha crop, only sample within 0.5-1ha). For small, confined breeding sites, take fewer samples (no less than 3).

3. Spread each sample onto a flat surface and sort through using the trowel or a pen to quickly count the fly larvae.

4. Record the numbers of fly larvae from each sample and obtain the average. This average indicates the level of fly breeding that is occurring (see rating system below).

<table>
<thead>
<tr>
<th>NUMBER OF FLY LARVAE</th>
<th>RATING OF FLY BREEDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 10 larvae</td>
<td>Severe</td>
</tr>
<tr>
<td>5-10 larvae</td>
<td>Moderate</td>
</tr>
<tr>
<td>less than 5 larvae</td>
<td>Slight</td>
</tr>
</tbody>
</table>

5. If the level of fly breeding is rated as severe or moderate, it should be dealt with immediately (see advice on next page) as these levels of breeding may render you liable for legal action under the Health (Fly Eradication) Regulations.

6. If fly breeding is consistently rated as slight but the owner/occupier is clearly not making an effort to minimise breeding (by adopting best management practices) see below, the person may still be liable for legal action under the Fly Eradication Regulations.

Market gardeners and other horticulturists are urged to obtain a copy of the document Best Crop Production Practises for Managing Fly Breeding and using Manure from Agriculture WA and the video Controlling Flies in Horticulture from the Health Department of WA.

In every situation, the decision to either issue an official warning for fly breeding or proceed with legal action remains at the discretion of the Authorised Local Government Officer.
What to do if you find fly breeding

For small areas of fly breeding
(e.g. wet lawn clippings, spilled animal manures, wet feed)

- spread the material out thinly over the ground (not more than 2cm). This will allow the material to dry out and reduce the risk of further breeding,

- apply a larvicidal insecticide to ensure existing breeding (live maggots) is controlled. Use products such as either Neocid 200®, Lepidex 500®, Provap®, or Neporex®. Always check the label instructions before use,

- re inspect the infested material 2–3 days after treatment by taking at least 3 random trowel samples [see previous page] to ensure there is no further breeding. If there is, evidence of live fly maggots, then re treat with a larvicide.

For large areas of fly breeding
(e.g. applications of animal manure, crop residues after harvest, manure stockpiles).

- where animal manure has been applied as a pre plant, sideband or surface dressing, you should treat the entire area with a larvicide (see above). Reinspect every 2–3 days by using the sampling method described on the previous page. If there is further breeding (live maggots), re treat the area with a larvicide. (Avoid applying animal manures as a surface dressing, particularly over summer months, as it will attract flies and can result in significant breeding)

- where fly breeding is occurring in large manure stockpiles (normally wet patches) you should treat the entire surface of the stockpile with a larvicide. Reinspect as mentioned above (and previous page) and re treat with a larvicide if there is further breeding. (To minimise the potential for fly breeding, always keep manure stockpiles dry, away from sprinklers and completely covered during the winter months)

- In large areas of crop waste remaining after harvest, it is essential to break up the material by either ‘fast chop’ rotary hoeing or using slashing equipment. This should be done as soon as possible after harvesting is complete. Then apply a larvicide over the ‘trashed’ waste and incorporate the material into the soil by rotary cultivation within 2–3 days

- alternatively, crop waste such as reject tomatoes, capsicums or carrots should be buried on a daily basis. The best practice is to excavate a pit or trench (at least 1 metre deep and sufficient width) that will handle the amount of daily waste. The waste should be spread in a layer (not more than 300mm) then covered with at least 200 mm of sand. The area should then be compacted to ensure complete burial

For further information on industry best practises and fly control, see reference sources at the end of this pamphlet
The Effects of Nuisance Flies

Bull being bitten by stable flies

Human lifestyle affected

Dog distressed by biting stable flies

Stable flies biting the legs of a horse

For further information on the use of Animal Manures and Fly Breeding, please either contact the Health Department of WA, Environmental Health Service on 9388 4999, or Agriculture WA on 9368 3333, or refer to:

- Controlling Flies in Horticulture, Video, Health Department of WA (2000)

This brochure is a joint publication by Agriculture WA, Entomology Section (Dr David Cook and Dr Ian Dadour) and the Health Department of WA, Environmental Health Service (Dave Peckitt and Owen Ashby)