Controlling Walnut Husk Flies

The walnut husk fly, *Rhagoletis completa*, is a serious pest of walnuts in most commercial walnut-growing districts of Oregon. At the present time, the insect is well distributed in all commercial orchards and in many backyard trees. Infestations of the walnut husk fly have persisted in Oregon over a period of years and, in some cases, have caused heavy damage to nuts.

The walnut husk fly has been a pest of walnuts in California since 1926, and it is considered to be one of the most damaging walnut pests in that state. Increasing numbers of this pest started to appear in Oregon orchards toward the end of the 1960's. Information on life history and control appearing in this fact sheet is based largely on work done by California entomologists and orchard studies conducted by the senior author in Oregon.

This fact sheet provides:
1. Information on life history and control of the pest, which will be useful to you, whether you have only a few trees or grow walnuts commercially; and
2. Information on trapping techniques that you can use to determine the presence of the insect and when to apply control measures.

**Life cycle**

The walnut husk fly overwinters in the soil under walnut trees in small, hard, brown cases called puparia. The date of fly emergence from puparia varies with the season and locally.

First flies of the season are usually trapped during early July (Wasco County), late July (Jackson County), and early August (Willamette Valley). First flies may continue to emerge until October.

The flies usually fly from 1 to 4 weeks before they mate and begin to lay eggs. As a rule, they are easy to recognize. They are about the size of a house fly and have blue-green and brown wings with yellow semicircle markings on their back. (Figure 1). Their eyes are blue-green and the wings are marked with brownish bars.

The beginning egg-laying period depends on the hardness of the husks. The flies cannot oviposit until the husks soften. The female husk fly penetrates the husk with her sharp ovipositor and deposits several pearly, white eggs in a pocket that she makes. The eggs hatch in 5 to 7 days, depending on temperature, and the young begin to feed on the husk. The larvae complete their development in 3 to 5 weeks. The mature larvae tunnel to the outside of the husk and drop to the ground where they enter the soil to depths of from 1 to 4 inches. There is one generation a year.

**Injury**

Injury to the walnut is caused by the larvae. When they feed on young husks, they release a dark liquid that stains the shells and at times darkens the kernels. The larvae also injure the conductive tissues of the nut, which results in a thinning of the shell. Heavily infested husks show blackened areas on the outside. When you break into these areas, you can see the larvae.

The only condition that might be confused with walnut husk fly injury is walnut blight. Walnut blight is distinguished from husk fly damage because the area affected by blight is usually roughened, sunken, and cracked. Areas are usually hard, as compared with the soft husks infested by the walnut husk fly larvae. The Franquette and Mayette varieties and seedlings of Manregian and Carpathian are considered to be very susceptible to husk fly damage.

**Control**

Timing is the most important for effective walnut husk fly control. Apply insecticides soon after flies in fly traps show a sharp increase. In most areas, this will probably be from mid-July to mid-August.

A second application may be necessary 3 to 4 weeks later. Home owners will have difficulty spraying large walnut trees unless they have access to power spray equipment.

**Use insecticides safely!**

Of the insecticides mentioned in this fact sheet, only malathion should be used by the home owner in towns and around dwellings. This is one of the least hazardous insecticides, and it can be used safely when the restrictions and precautions are followed.

Other materials mentioned should only be used by the commercial orchardist or by individuals experienced in the use of insecticides.

Before using any insecticide, read and follow the precautions on the manufacturer’s label—even if you’ve used the insecticide before.

To avoid excess insecticide residues at time of harvest, observe the restrictions shown in table 1. Always follow the label directions on the insecticide container. In addition, note these points carefully:

- Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.
- Be cautious when you apply insecticides or any other pesticides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

**Table 1.—Insecticides, rates, and restrictions**

<table>
<thead>
<tr>
<th>Insecticide formulation</th>
<th>Rate per Acre</th>
<th>Interval between last application and harvest</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malathion 25% WP 1-1.5 lb</td>
<td>8-10 lb</td>
<td>0 days</td>
<td>See label</td>
</tr>
<tr>
<td>Phosphamidon 8 Spray 0.25 lb</td>
<td>1 pt</td>
<td>7 days</td>
<td>See label</td>
</tr>
<tr>
<td>Zolone 3 EC 1.3-2 pt</td>
<td>2-3 qt</td>
<td>30 days</td>
<td>Do not apply more than 50 pt/acre/yr.</td>
</tr>
</tbody>
</table>
Walnut husk fly traps

To effectively control the walnut husk fly, apply treatments at the proper time. Traps are used to determine this. The date of spray application will vary from one area to another. If the fly becomes established in commercial orchards, this date may vary from one orchard to another, depending on the elevation, soil type, slope, and vegetation.

Monitoring fly emergence in individual orchards and applying insecticides only when flies are caught in the traps will not only reduce unnecessary spraying but will also help in obtaining better control from the spray you do apply.

Dry ammonium carbonate trap. Commonly called the "Frick trap" for the man who designed it, this is the most widely used trap, and it's simple to prepare. You make it from the type of cardboard ice cream container that's been treated on the inside to prevent absorption by the cardboard.

Coat the inside with a sticky material to trap the flies. Perforate the bottom of the container with small holes, to allow ammonia fumes to pass into the container. Put 3 level teaspoons of ammonium carbonate into the container with small holes, to allow ammonia fumes to pass into the container. Put 3 level teaspoons of ammonium carbonate into the container. Place a wire collar around the carton and bend it into a hook, for hanging on small limbs (figure 2). Position the carton so it will tilt forward, to prevent rain from entering the carton. To place the trap in the tree, use a thin pole 8 to 10 feet long, with a hook or bent nail on the end.

Place your traps on the north sides of trees, in areas of dense foliage and high enough to have some leaves below. Hang the traps so they can rotate freely.

When you're selecting the trees in which to place your traps, choose those that have dense foliage where you noticed the heaviest damage to nuts last year and where moisture is abundant—for example, near irrigation ditches or standpipes. Five traps are enough for an average-size orchard. Place traps several trees apart. Examine them three times a week and keep records of the flies trapped on the sticky surfaces on the inside of containers.

When the fly population shows a continuous rise for at least 3 consecutive days, apply a treatment within 10 days. Examine the nuts to determine the number of egg punctures associated with the trap catch. These traps are recommended.

The sticky material you'll use to coat the inside of the ammonium carbonate trap is similar to that usually used on old-fashioned flypaper. An absorbent that has given satisfactory results in making the Frick Stickem, manufactured by Michel & Pelton Co., 524 H Sts., Oakland, CA 94608. This and similar products may not be available from local dealers until there is a greater demand. You can buy the ammonium carbonate crystals from local drugstores or drug supply houses.

Bait pan method. Bait pans are very effective. But use them only where you have no fear that they might be hazardous to children—because of the possibility of spilling the caustic fluid. A 2-quantal-sized pan is recommended.

To prepare the bait, add 3 ounces of dry ammonium carbonate to 1 gallon of water. A compound that has proven satisfactory in making this trap is Stickem, a formulation of caustic fluid. A 2-quart galvanized pan is recommended.

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