

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 locality.

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 spend from 1 to 2 weeks on walnut foliage before they mate and begin to lay eggs. Adult flies are easy to recognize. They are about the size of a house fly and brown in color with yellow semicircle markings on their backs (figure 1). The eyes are blue-green and the wings are marked with brownish bars.

The beginning of the egg-laying period depends on the softness of the husk. 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 temperatures, and the young begin to feed on

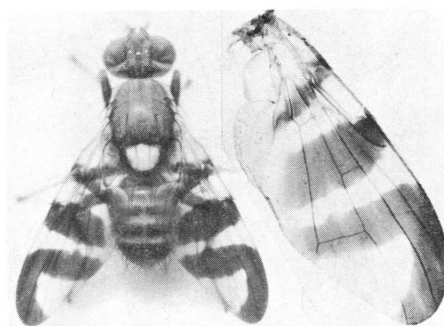


Figure 1.—Adult walnut husk fly and enlarged wing, showing distinctive markings characteristic of the species (photo courtesy of Dr. John Ortega, University of California).

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 the husk, they release a dark liquid that stains the shells and at times darkens the kernels. The larvae may also injure the conductive tissues of the nut, which results in shriveling of the kernel. 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. These 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 very important for effective walnut husk fly control. Apply insecticides soon after catches in fly traps show a sharp or steady increase over a 3-day period. In most areas, this will probably be from early 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 insecticide safely!

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

The 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

Insecticide formulation	Rate per		Interval between last application and harvest; restrictions
	100 gallons water	Acre	
Malathion 25% WP	1-1.5 lb	8-10 lb	0 days
Phosphamidon 8 Spray	0.25 pt	1 pt	7 days
Zolone 3 EC	1.3-2 pt	2-3 qt	30 days. Do not apply more than 50 pt/acre/yr.



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 lid and place it over the perforated *bottom*.

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 stand pipes.

Five traps are enough for the 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 insides of containers.

When the fly population shows a continuous rise for 2 or 3 consecutive days, apply a treatment within 10 days. Examining the nuts to determine the number of egg punctures should help you decide when to make your first application.

The sticky material you'll use to coat the inside of the ammonium carbonate trap is similar to the material used on old-fashioned flypaper. A compound that has proven satisfactory in making this trap is Stickem, manufactured by Michel & Pelton Co., Manufacturing Chemists, Landregan & Powell 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 druggists 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

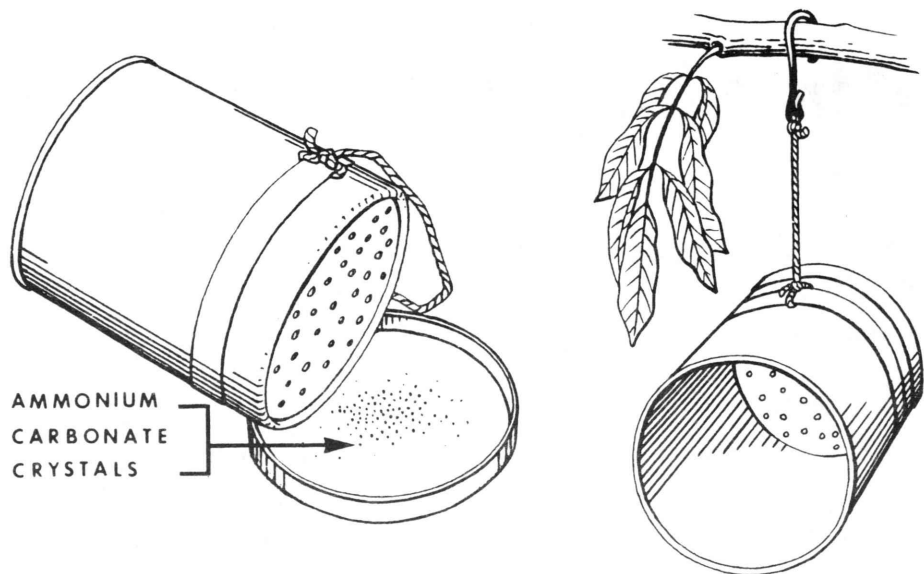


Figure 2.—Preparing and placing the ammonium carbonate trap.

the caustic fluid. A 2-quart galvanized pan is recommended.

To prepare the bait, add 3 ounces of Glycine (amino acetic acid), and 4 ounces of household lye, to 1 gallon of water.

Wire the pan with 16-gauge wire and tie a sash cord or cotton rope (3/16-inch diameter, 30 to 40 feet long) to the wire. Thread the rope through a small pulley wired to a limb in the upper north side of the tree. Then raise the pan containing the bait to the desired height in the tree, preferably in an area with dense foliage.

This type of trap has been very satisfactory, and the bait improves with age.

Pherocon AM traps. These are perhaps the most effective traps for capturing walnut husk flies. They're the easiest to handle; they're ready to use when you buy them. Place them in your walnut trees in the same manner we outlined for the dry ammonium carbonate traps.

These traps are made of rectangular pieces of cardboard that are painted a daylight-fluorescent saturn yellow and coated with a sticky attractant (ammonium acetate and soy hydrolysate). Unlike the attractant in the dry ammonium carbonate trap, this one is mixed into the sticky material.

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