

The Walnut Husk Fly in Oregon

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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 towards the end of the 1960s. Biological studies have been conducted by the senior author during the past 8 years, and the information reported in this fact sheet summarizes the data obtained.

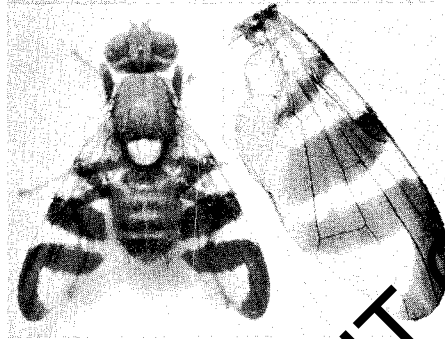
The purposes of this fact sheet are:

1. To provide information on life history and control of the pest that will be useful to the individual with a few trees and to the commercial producer.
2. To provide information on various trapping techniques that can be used 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. In 1968 flies were caught in traps located near The Dalles during the last week in July. Adults started to emerge in Jackson County in late July, and the first catch of the season in Multnomah County was on August 1. During the past year (1980), flies did not start to emerge in the Willamette Valley until August 1. 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, are brown in color, and have yellow semicircle markings on their backs. Their eyes are blue-green and their wings are marked with brownish bars.



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

The beginning of the egg-laying period depends on the richness of the walnut 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 she makes. The eggs hatch in 3 to 7 days, depending on temperatures, 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. While feeding 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 these areas are broken into, the larvae can be seen.

The dry condition that might be associated with walnut husk fly injury is walnut blight. Walnut blight is distinguished from husk fly damage in that the area affected by blight is usually rounded, 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 Manregia and Carpathian are considered to be very susceptible to husk fly damage.

Control

Timing is very important for effective walnut husk fly control. Insecticides should be applied 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 Insecticides 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.

Insecticides, Rates, and Restrictions

Insecticide formulation	Rate per		Restrictions
	100 gallons water	Acre	
Malathion 25%	1-1.5	8-10 lbs	0 days
Phosphamidon 8 Spray	0.25 pt	1 pt	7 days
Zolone 3 EC	1.3-2 pts	2-3 qts	30 days. Do not apply more than 50 pts/acre/year.

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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 the precautions on the manufacturer's label. Always follow the directions on the label.

To avoid excess insecticide residues at time of harvest, observe the restrictions shown in the accompanying table.

Walnut Husk Fly Traps

To effectively control the walnut husk fly, treatments should be applied 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 also vary from one orchard to another, depending on the elevation, soil type, slope, and vegetation. Monitoring of fly emergence in individual orchards and application of insecticides only when flies are caught in the traps will not only reduce unnecessary spraying but will help in obtaining better control from the spray applied.

1. Dry ammonium carbonate trap

The dry ammonium carbonate trap, commonly referred to as the Frick trap for the man who designed it, is the most widely used trap and is simple to prepare. The trap is made from an ice cream container, the type that has been treated on the inside to prevent the cardboard from absorbing the ice cream. Coat the inside of the container with a sticky material to trap the flies and perforate the bottom with small holes to allow ammonia fumes to pass into the container. Place three level teaspoons of ammonium carbonate into the lid and set the container inside the lid with the perforated bottom next to the ammonium carbonate. Place a wire collar around the carton, bending the end into a hook for hanging on small limbs. Put the carton downward to prevent rain from entering.

To place the trap in the tree, use a small pole 8 to 10 feet in length with a hook or bent nail on the end. Place the traps on the north side of the tree in an area of dense foliage that is high enough to have some leaves below. Hang the trap so it can rotate freely. Select trees with dense foliage that are located in areas where heaviest damage to nuts was noticed the previous season and where moisture

is abundant (near irrigation ditches or standpipes). Five traps are sufficient for the average-size orchard. Allow several trees to separate those chosen for traps. Examine the traps three times a week, and keep records of the number of flies trapped upon the sticky surface of each container. When the fly population shows a continuous rise for 2 or 3 consecutive days, a treatment should be applied within 10 days. Examination of nuts to determine the number of egg punctures should help decide the time of the first application.

The sticky material used to coat the inside of the ammonium carbonate trap is similar to the material used on old-fashioned flypaper. Special sticky compounds called "Stickem" manufactured by Michel & Pelton Company, Manufacturing Chemists, Landegran & Powell Streets, Emeryville, California, and "Seneco Bird Repellent," manufactured by Sennewald Drug Company Inc., 2723 Chateau Avenue, St. Louis, Missouri, are satisfactory in making this trap. These or similar compounds may not be available from local dealers until there is a greater demand. Ammonium carbonate crystals may be purchased from local druggists or drug supply houses.

2. Bait pan method

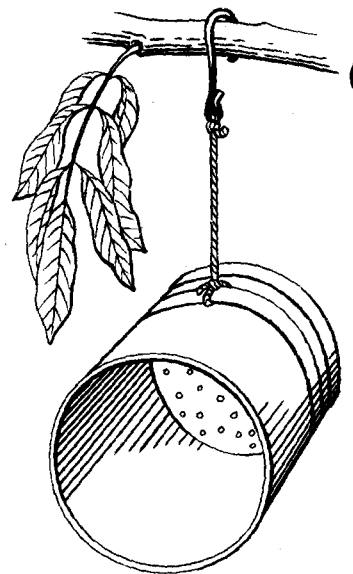
Bait pans are very effective and can be used where there is no fear that they might be hazardous to children because of the possibility of spilling the caustic fluid. Use

a galvanized pan with a capacity of 2 quarts. The bait consists of 3 ounces of Glycine (amino acetic acid) plus 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 in. in diameter, 80 to 40 ft. 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.

3. The Zocon AM standard trap

Zocon AM standard traps are perhaps the most effective traps for capturing the walnut husk fly. These traps are manufactured and marketed by the Zocon Corporation of Palo Alto, California, and are ready for use as purchased. They are made of rectangular-shaped pieces of cardboard that are painted a dayglo fluorescent sapphire yellow and covered with a coat of sticky attractant made of ammonium acetate and soy hydrolysate. This attractant, unlike the one used on the dry ammonium carbonate trap, is mixed with the sticky material. The Zocon traps are the easiest to handle and are as effective if not more so than the other two traps. Arrange these traps in the walnut trees of the orchard in the same manner as described for the dry ammonium carbonate traps.

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