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WALNUT HUSK FLY

The walnut husk fly is a serious pest of walnuts in the Pacific Northwest and causes damage to walnuts in many parts of Washington. It has also been an occasional pest of late peach varieties in the Maryhill area of south central Washington.

Life History

Husk flies spend the winter in the soil as resting pupae under the host tree, usually walnuts. Adult flies emerge in midsummer, usually July and August, but may continue to emerge as late as October. Flies are about the size of a small housefly, brown with a yellow semicircle on the back. The eyes are blue-green, the wings are marked with brownish bars. Mating and egg laying begin soon after adults emerge and may continue into the fall. Females lay several tiny, pearly colored eggs on walnut husks or nearly mature peaches. Eggs require about 5 to 7 days to hatch. The tiny white maggots feed in the walnut husk and under the skin of the peach until they reach maturity several days later. Mature larvae drop to the ground, change to resting puparia, and spend the winter waiting to change to adult flies the following season.

Injury

Larvae feed on walnut husks and release a dark liquid that stains shells and at times darkens 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. These areas are soft and, when broken into, the larvae are visible. Larvae may attack and destroy peaches by feeding under the skin.

The only condition that might be confused with walnut husk fly injury in walnuts is walnut blight. Walnut blight can be distinguished from husk fly damage by the fact that 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. Most English walnuts, including the Franquette and Mayette varieties, as well as seedlings of Manregin and Carpathian walnuts, are very susceptible to husk fly damage.

Detection of Husk Flies

Traps are used to determine when sprays should be applied. The date of spray application will vary from one area to another. If flies become established in commercial orchards, the date may vary from orchard to orchard in the same district.

Trapping Methods. Several trapping methods are available.

1. *The dry ammonium 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 the type of cardboard ice cream container that has been treated on the inside to prevent absorption by the cardboard. The inside is coated with a sticky material to trap the flies. The bottom on the container is perforated with small holes to allow ammonia fumes to pass into the container. Three level tablespoons of ammonium carbonate are put into the lid and placed over the perforated bottom. A wire collar is placed around the carton and bent

into a hook for hanging on small limbs (see figure 2).

The cartons used in the Frick trap should be placed in such a way that they tilt to prevent rain from entering the cartons. 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. Hang the Frick trap so that it can rotate freely. Other traps need not be free rotating. In selecting trees in which to place the traps, choose trees that have dense foliage where heaviest damage to nuts was noticed the previous season and where moisture is abundant. Place traps on the north side of the tree in an area of dense foliage with leaves below. Five traps for the average-size orchard are sufficient. Place traps several trees apart. Examine three times a week and record number of flies trapped on the sticky surface on the inside of the container. When the fly population shows a continuous rise for two or three consecutive days, spray should be applied within ten days.

Sticky materials used to coat the inside of the ammonium carbonate trap are similar to materials used on old-fashioned flypaper. The material may be found listed as various trade names such as "Stickum," manufactured by Michel & Pelton Company, Manufacturing Chemists, Landregan & Powell Streets, Emeryville, California; and "Senco Bird Repellent," manufactured by Sennewald Drug Company, Inc., 2723 Choteau Avenue, St. Louis, Mis-

souri. Either is satisfactory in making this trap. Ammonium carbonate crystals may be purchased from local druggists or drug supply houses.

2. *Pherecon AM Trap*: A commercially manufactured trap prepared by Zoecon[®] Industries, 975 California Avenue, Palo Alto, CA 94394. The attractant is impregnated in the stickum material on each trap.
3. *Yellow sticky board traps* using bright yellow sticky-covered boards about 6 inches square with a small bottle of ammonium carbonate attached to the lower part of the trap may also be used.

Bait Pan Method. Bait in pans is effective and can be used where there is no hazard to children due to the possibility of spilling the caustic fluid. A two-quart capacity galvanized pan is recommended. The bait consists of 3 ounces of Glycine (amino acetic acid) plus 4 ounces of household lye, to one gallon of water. Wire the pans with 16-gauge wire. Use sash cord or cotton rope 3/16 inches in diameter, approximately 30 to 40 feet long. Tie to the wire. Thread the rope through a small pulley which is wired to a limb in the upper north side of the tree. The pan with the bait is then raised to the desired height in the tree, preferably in dense foliage. This trap has been very satisfactory, and the bait improves with age.

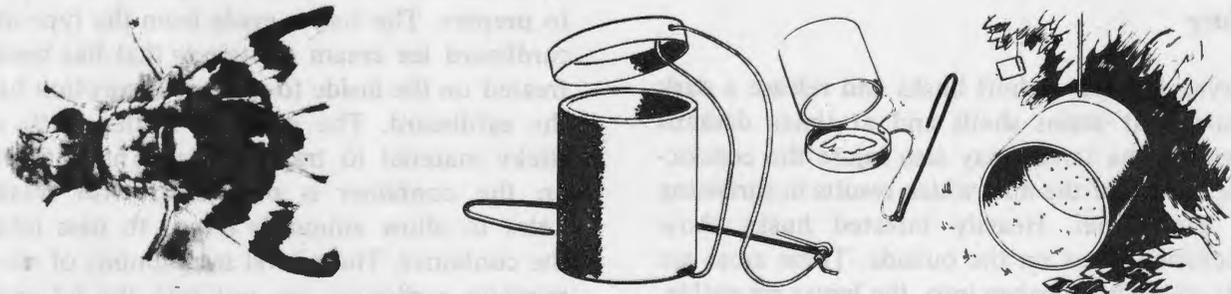


Figure 1. The walnut husk fly, *Rhagoletis completa*, male, showing wing markings, and characteristic position of wings. Figure 2. The Frick trap, showing where to place chemical and how to hand trap.

Control

Non-chemicals: Sanitation—elimination of fallen infested walnuts and adequate control of walnut blight greatly reduces the potential of walnut husk fly buildups. Areawide removal of fallen nuts, infested nuts, and blighted nuts is extremely helpful in husk fly reduction.

Chemical: Insecticides should be applied within 10 days 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. Homeowners will have difficulty spraying large walnut trees unless they have access to power spray equipment.

**Insecticides and Restrictions
Commercial Orchards**

**Insecticide Formulation and Amount to Use
Per 100 Gallons of Water**

Malathion—1-1.5 lbs. 25% W.P.*
Parathion[†]—2 lbs. 25% W.P.*
Ethion—1.5 lbs. 25% W.P.*

Trithion[†] 1.5 lbs. 25% W.P.*
Phosphamidon—0.25 pt. 8 lb./gal. E.C.*
Bait spray—Use 4 lbs. 25% malathion W.P. plus 2 qts. Staley's Bait No. 7 in 100 gals. water/acre. If aircraft is used to make the application, apply the same amount of insecticide and bait in 10 gals. water/acre.**

Restrictions: Interval Between Last Application and Harvest

No time limitations.
Do not apply after husks open.
Do not apply after husks split. Do not apply more than twice during the fruiting season.
Do not apply after husks split.
Seven days.

**Insecticides and Restrictions
Home Use**

Material	Amount Per Gal. Water	Restrictions
Malathion 25 W.P. Staley's bait may be added at 4 teaspoons per gallon of water.	1/3 oz. or 3/4 tablespoon	None

* For mature orchards, use 8-10 lbs. 25% malathion W.P. or 8 lbs. 25% parathion W.P. or 6 lbs. 25% Ethion W.P. or 6 lbs. 25% Trithion W.P. or 1 pt. Phosphamidon 8 lbs./gal. E.C./acre.

** A. E. Staley Manufacturing Company is the source of Staley's Bait. Local dealers are unlikely to stock this material until there is a demand for it; check with your spray dealer. A source of small quantities of Staley's bait is Vanellas Farm Store, P.O. Box 803, Chico, California 95927.

W.P. = wettable powder

E.C. = emulsifiable concentrate

Several insecticides have been useful in the control of walnut husk flies. Malathion is the only insecticide that should be used in towns and around dwellings. The other materials should be used only in commercial orchards by individuals experienced in the use of insecticides. The addition of Staley's bait to the malathion has given better control in tests conducted in California.

Before using any insecticide, read and follow the precautions on the manufacturer's label.

Our thanks to the entomology specialists of Oregon State University and University of California for much of the material shown in this publication.

Pests Not on Product Label: Some suggested uses of pesticides in this publication are for pests not listed on product labels. These are indicated by the symbol + . Such uses comply with the federal law (FIFRA) which says a use is consistent with label directions provided the crop or site is on the label and directions concerning rates and interval before harvest are followed. These suggested uses may not be used in advertising or other promotional literature.

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Cooperative Extension programs and employment are available to all without discrimination. Trade names have been used to simplify information. No endorsement is intended.



Use pesticides with care. Read the label and follow its directions. Never smoke while using pesticides and avoid breathing the spray or dust. Wear natural rubber gloves when handling pesticides. Wash hands and face carefully with soap and water after applying. If insecticides are spilled on skin or clothing, remove contaminated clothing and wash skin thoroughly. Store pesticides in their original containers and be sure labels remain on the containers. Keep containers away from food or feed and out of reach of children or irresponsible persons.