

The Walnut Husk Fly

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The walnut husk fly, a serious pest of walnuts, is a potential threat in commercial walnut growing districts of Oregon. Survey entomologists of the Oregon State Department of Agriculture have reported this pest in Clackamas, Douglas, Hood River, Jackson, Josephine, Malheur, Multnomah, Umatilla, Wasco, and Yamhill counties. At the present time, the insect is not a problem in commercial orchards. 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 grown on "back yard" trees.

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. Field observations on the biology and control of this pest have been conducted since 1928. Information on life history and control appearing in this fact sheet is based largely on work done by California entomologists.

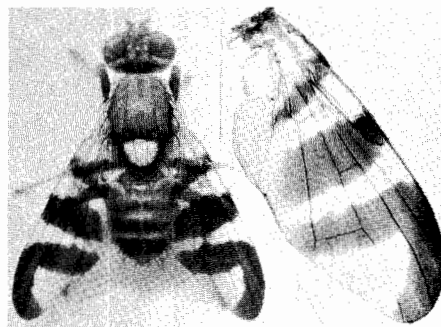
The purposes of this fact sheet are:

1. To provide information on life history and control of the pest which will be useful to the individual with a few trees and to the commercial producer.
2. To provide information on the preparation of a trap that can be used to determine the presence of the insect and when to apply control measures.

Life Cycle

The walnut husk fly usually overwinters in the soil under walnut trees in small, hard, brown cases called puparia. The date of fly emergence from puparia is variable with the season and locality. In 1968 flies were caught in traps located near The Dalles during the last week in June. Adults started to emerge in Jackson County in late July, and the first catch of the season in Multnomah County was on August 1. Flies may continue to emerge until October.

The flies usually spend from two to three 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 a yellow



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

semicircle on the back. 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 which she makes. The eggs hatch in five to seven days, depending on temperatures, and the young begin to feed on the husk. The larvae complete their development in three to five 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 one to four inches. There is one generation a year.

Injury

The injury to the walnut is caused by the larvae which feed on the husk and 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. These areas are soft and when broken into the larvae are visible.

The only condition that might be confused with walnut husk fly injury 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. The Franquette and Mayette varieties and seedlings of Manregin and Carpathian are considered to be very susceptible to husk fly damage.

Control

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 three to four weeks later. Home owners will have difficulty spraying large walnut trees unless they have access to power spray equipment.

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.

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 by following ordinary precautions.

The other materials mentioned should only be used by the commercial orchardist. Parathion is especially hazardous to the user. Ethion, Trithion, and Phosphamidon are somewhat less hazardous but dangerous if carelessly handled.

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

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

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Insecticides and Restrictions

Insecticide and amount to use per 100 gallons of water	Restrictions Interval between last application and harvest
Malathion—2 lbs. 25% W.P.*	No time limitations.
Parathion—2 lbs. 25% W.P.*	Do not apply after husks open.
Ethion—1.5 lbs. 25% W.P.*	Do not apply after husks split. Do not apply more than twice during the fruiting season.
Trithion—1.5 lbs. 25% W.P.*	Do not apply after husks open.
Phosphamidon—0.25 pt. 8 lb./gal. E.C.*	Seven days.
Bait spray**—Use 4 lbs. 25% malathion W.P. plus 2 qts. Staley's Bait No. 7 in 100 gals. water per acre. If aircraft is used to make the application, apply the same amount of insecticide and bait in 10 gals. of water per acre.	

* For mature orchards, use 8 pounds 25% malathion W.P., or 8 pounds 25% parathion W.P., or 6 pounds 25% Ethion W.P., or 6 pounds 25% Trithion W.P., or 1 pint Phosphamidon 8 lb./gal. E.C. per 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.

W.P. = wettable powder

E.C. = emulsifiable concentrate

Walnut Husk Fly Traps

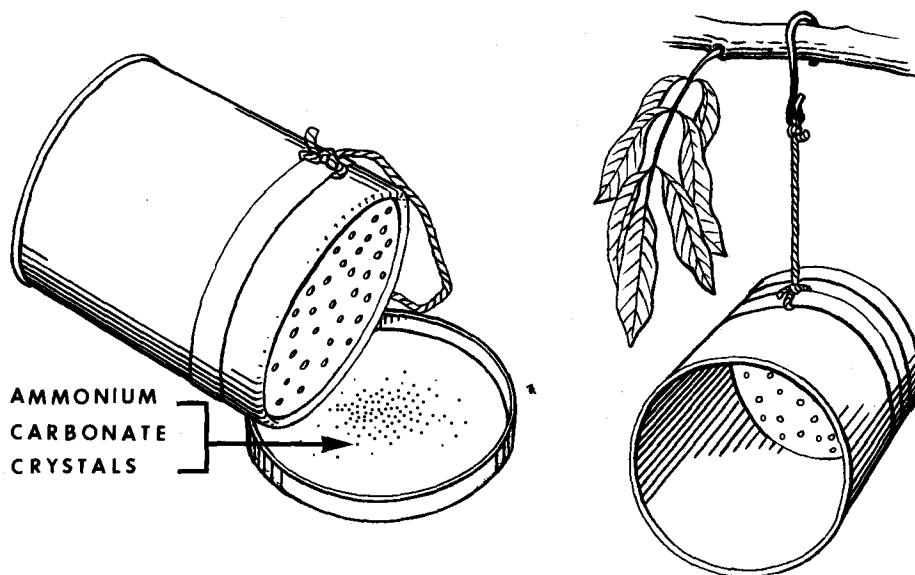
To effectively control the walnut husk fly, spray should be applied at the proper time. Traps are used to determine when sprays should be applied. The date of spray application will vary from one area to another. If the fly becomes established in commercial orchards, this date may vary from one orchard to another in the same district.

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 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 of 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.

The cartons 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. Traps should be placed on the north side of the tree in an area of dense foliage and high enough to have some leaves below. Hang the trap so that it can rotate freely. In se-

lecting 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, for example, near irrigation ditches or stand pipes. Five traps for the average-size orchard are sufficient. Traps should be placed several trees apart. They should be examined three times a week, and records should be kept of the 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, a treatment should be



applied within ten 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 fly paper. Special sticky compounds called "Stickum" manufactured by Michel & Pelton Company, Manufacturing Chemists, Landregan & Powell Streets, Oakland, Emeryville, California, and "Senco 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 druggist's or drug supply houses.

Bait pan method

Bait in pans is very effective and can be used where there is no fear that the bait pan might be hazardous to children because of 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. The pans are wired with 16-gauge wire. Sash cord or cotton rope 3/16 inches in diameter, approximately 30 to 40 feet long, is tied to the wire. The rope is threaded through a small pulley which is wired to a limb in the upper north side of the tree. The pan containing the bait is raised to the desired height in the tree, preferably in dense foliage. This type of trap has been very satisfactory, and the bait improves with age.