

## Walnut Husk Fly Management in the Southern San Joaquin Valley

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Walnut Husk Fly (WHF) has become a greater problem for walnut growers in the southern San Joaquin Valley. Once uncommon, more growers now discover WHF too late in the season to prevent it from substantially reducing walnut value. Since treatment typically begins in late July to early August, now is a good time to be reminded of the biology, monitoring, and spray timing for this pest. Although any variety can be infested with WHF, it is most commonly found in Serr, Chandler, Tulare, Hartley, and Franquette. Orchards next to abandoned groves, canals or rivers with riparian vegetation, or their favorite host, black walnut, are more likely to experience economic damage. The hulls of infested nuts turn dark brown to black and are very mushy. Removal of the damaged hull often reveals the maggot stage of the fly larva, as well as severe staining of the shell. Such staining is external offgrade, and the walnut kernel is also often darkened and moldy from WHF infestation. Maggots from infested nuts drop to the orchard floor, where they survive in the soil as pupae for as long as two years. Flies begin emergence the following season in mid-July, and peak in mid to late August. There is one generation per year.

WHF damage begins as a tiny, black spot on the hull surface. It resembles “fly spec” typically seen on walnut surfaces in groves adjacent to dairies. This black spot results from the female fly inserting (ovipositing) her miniature, rice-shaped eggs, into the hull tissue. The trained eye can identify these within two hours following oviposition. They are commonly referred to as “stings”. Stings often result in a dark “tear-mark” emanating from the sting, and should be used to identify WHF activity during field scouting. The presence of stings at this time of the season indicates the degree of infestation that has already taken place, and can be used to determine if immediate action is necessary. Orchards with a history of WHF should be monitored twice weekly for the first observation of stings, with treatment commencing as soon as possible thereafter.

The above “management” method for WHF is re-active, and therefore not preferred over the more scientific, pro-active one outlined at the University of California Integrated Pest Management website (<http://www.ipm.ucdavis.edu/PMG/r881301211.html>). The success of waiting for initial damage to occur is dependent upon how diligent one is in weekly monitoring, how large the infestation is, and how quickly you can accomplish treatment. I only suggest it for experienced growers with their own spray rig. I describe it first in this newsletter, knowing that many growers are unaware of this problem, and therefore hope that they venture out into their orchard to investigate before it is too late to avoid loss of substantial income!

The preferred method of monitoring involves purchase of WHF traps from your agricultural supplier. These traps consist of a yellow card covered with a clear, tacky material (called “tanglefoot”) used to capture the fly. A vial of ammonium carbonate comes with the trap, and one attaches it to the wire that suspends the trap in the tree. It is important NOT to use Apple Maggot traps, which closely resemble those of WHF, but they are much less effective in attracting husk flies due to an acetate-based material mixed into the tanglefoot. This imparts a slight brown color to the apple maggot tanglefoot, so the two traps can be readily distinguished in the field.

WHF traps should be placed in the **upper third** of the walnut canopy by early July. Do NOT hang them low and in the sun. This location is worthless for effective monitoring. Instead, place them on the north side of the tree in a shady, preferably damp location. Placement in locations of previous damage is highly recommended. This is often near ungrafted black walnuts, a favored WHF host. A minimum of three traps should be placed per orchard. See the UC IPM website for

trap guidelines in large orchards. Monitor traps twice weekly. Flies other than WHF will stumble into the trap. WHF can be distinguished by a yellow spot in the middle of their back, dark triangular bands at their wing tips, and they are about half the size of the common house fly. Photos are available at the website provided above.

Once WHF are trapped, it is necessary to determine the females from males, and when the females begin egg production. Female WHF are slightly larger than the males, and their hind body portion (abdomen) is more pointed. They also have a small, needle-like object (ovipositor) protruding from their abdomen which inserts the eggs into the walnut hull tissue. The front leg of the female is also blonde in color, in contrast to the dark forelegs of the males. I realize this now sounds much too complicated and scientific for most of you, **BUT THE BEST SPRAY TIMING DEPENDS UPON WHEN THE FEMALES BEGIN PRODUCING EGGS!** Egg production is determined by placing them on a dark piece of paper and gently pressing their abdomen with a blunt object. Tiny, rice-shaped eggs will emerge from pregnant females. **Once found, growers have about 7 days to treat before the flies successfully oviposit eggs in the walnut hulls.** Use of this pro-active, but more labor intensive monitoring method prevents growers from spraying too early or late, and avoids costly, ineffective treatments. Interested growers and crop consultants can watch a 22 minute video in the Kings County office describing all aspects of WHF management, or purchase it through our ANR Catalogue (<http://anrcatalog.ucdavis.edu/>).

Properly timed treatments of longer residual materials such as Lorsban or Malathion 8EC are typically effective for about three weeks. Orchards with heavy damage in past years may need two treatments. A second spray would be needed if a sharp rise in pregnant females occurs three weeks after the first treatment. **Flies will continue to be caught in the traps after spraying**, especially if they were hung low in the canopy. This represents the high attractiveness of the ammonium carbonate “supercharger”, and flies which have not fed on treated surfaces. Treatments are discontinued three weeks prior to harvest. Spinosad-based materials such as Entrust and GF-120 are registered for organic use. These products require weekly application for economic control. The effectiveness of all treatments is significantly increased through the addition of protein bait (Nu-Lure by Miller, and Monterey Bait), which serves as both an attractant and feeding stimulant. Follow label instructions and the recommendation of your pest advisor for all pesticide applications. Spray timing can vary between neighboring orchards due to factors affecting WHF populations, and the fact that fly and egg development are NOT driven by temperature. WHF is different in this respect from codling moth and navel orangeworm. **Optimal treatment timing therefore requires monitoring individual orchards.** Aerial treatments are reportedly effective, providing they are properly timed, and use extended residual materials in combination with the protein bait.

Growers with past WHF problems, as well as those with quality problems matching the description of this newsletter should immediately scout their orchard for evidence of stings, and preferably arrange for trap monitoring if not already in place.