

# PLANT SCIENCES

ENTOMOLOGY (GENEVA) • 14

NEW YORK STATE AGRICULTURAL EXPERIMENT STATION, GENEVA, A DIVISION OF THE NEW YORK STATE COLLEGE OF AGRICULTURE AND LIFE SCIENCES, A STATUTORY COLLEGE OF THE STATE UNIVERSITY, CORNELL UNIVERSITY, ITHACA

## Using sticky traps to monitor fruit flies in apple and cherry orchards

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Sticky traps can be used to monitor the presence of adult fruit flies in cherry and apple orchards. The traps utilize both color and odor to attract the flies. It has been known for some time that the flies are attracted to the color yellow. Consequently, sticky board traps now used are colored yellow. The flies are also attracted to red and this color has been used on sticky spheres to monitor the apple maggot flies. Odor is the second stimulus. Household ammonia placed in bottles was a common attractant used in early sticky boards. The ammonia had to be changed frequently and the process was time-consuming. Today, the traps use Hy-Case Amino and ammonium acetate mixed into the sticky material on the traps. This attractant lasts several weeks under orchard conditions and lengthens the interval between trap changes to 2 to 3 weeks.

### CHERRY ORCHARDS

In cherry orchards, sticky boards can be used to monitor the emergence and/or presence of the black cherry fruit fly [*Rhagoletis fausta* (Osten Sacken)] and the cherry fruit fly [*Rhagoletis cingulata* (Loew)]. In New York State, both fruit flies emerge in late May or early June. Therefore, trapping should start the last week in May. The black cherry fruit fly which emerges about a week earlier than the cherry fruit fly in the spring, does not have the white bands on the abdomen as in the case of the cherry fruit fly and the black bands on the wings are broader and darker (Fig. 3).

After the first fly has been trapped in a cherry orchard, a standard spray schedule should be initiated and continued up to the proper interval before harvest. With the catch of the first fly and start of a spray program, trap monitoring can be discontinued. The pre-oviposition periods of the cherry fruit flies are 7 to 10 days in duration. This means sprays

should be applied promptly (i.e., no later than 4 days after first catch).

### APPLE ORCHARDS

Sticky boards are used in apple orchards to monitor the emergence and/or presence of the apple maggot [*Rhagoletis pomonella* (Walsh)] (Fig. 1). A model, based on accumulated heat units in the spring, has been developed that can be used to approximate first apple maggot fly emergence. Your cooperative extension agent should prepare a news release when the accumulated heat units in your area approach the time for first apple maggot emergence. At that time, the sticky boards should be placed in apple orchards and regular examination of the traps started.

The sticky board trap catches in apple orchards give more precise information than in cherry orchards. Apple maggots require 7 to 10 days to become sexually mature after emerging. Therefore, the first spray can be delayed up to 7 days after the first fly has been caught in an area. For example: You catch your first fly in a nearby abandoned orchard on July 4. On July 8, you catch a fly in your orchard. You then have until July 11 to apply a maggot spray to your orchard. On the other hand, you may not catch an apple maggot fly in your orchard for some time after the first fly was caught in the abandoned orchard. This will mean you need not apply an early maggot spray. After the 7-day period following first emergence has passed, you should spray as soon as possible after you trap a fly in your orchard. Also, do not spray when flies are caught and residues from an earlier spray are still present in effective amounts to protect your crop.

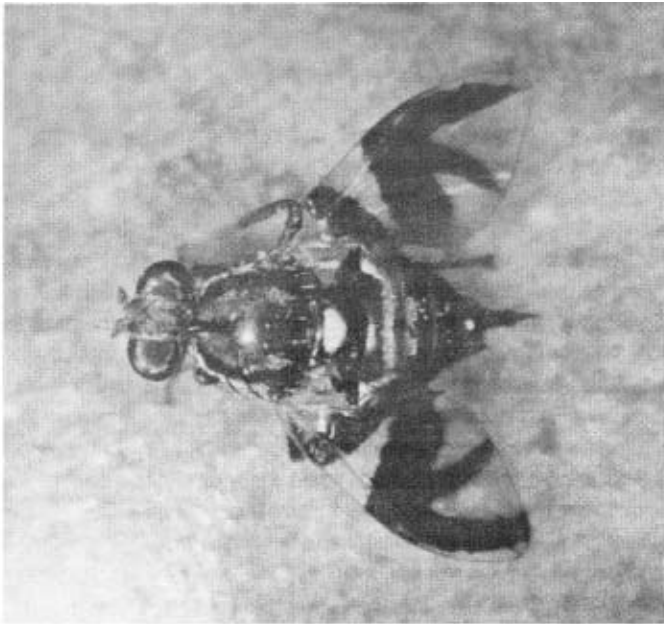


Figure 1.—Adult female apple maggot with ovipositor extended.

### TRAPPING PROCEDURES

Three factors are equally important in the effective use of sticky traps. They are: (1) proper placement of the traps, (2) frequent monitoring, and (3) correct identification of the flies.

### Trap Placement

Proper placement of the traps in the orchard and tree are both important. Typically, the preceding year's maggot control in commercial apple and cherry orchards will have been sufficient to have eliminated any infestation within the orchard and the first flies will not be captured there. Flies found in most commercial orchards will have migrated in from surrounding unsprayed areas. Therefore, to better know what the flies are doing in the area, it is wise to place and monitor a few traps in nearby unsprayed trees or abandoned orchards. It is not necessary to place and monitor a large number of traps in the interior of commercial orchards. Normally, one interior orchard trap for every orchard up to 50 acres is sufficient. More than one interior orchard trap may be necessary for farms of larger size. Interior-placed traps should be located on the south side of the earliest maturing variety. Traps placed along the borders of orchards help to monitor the migration of flies into those orchards. Place two to four traps on the earliest variety along the borders where unsprayed trees or orchards are nearby. The border placed traps should be located on the side of the trees facing out of the orchard. If the external habitat along the border is uniform (all woods or open fields) space the traps uniformly apart. If a portion of that border adjoins an abandoned orchard, wild fruit tree, or woods, place the majority of traps in that area.

Place the traps about 5 to 6 feet high in the trees. The traps should be surrounded by foliage and fruit but not obstructed from view or touched by them (Fig. 2).



Figure 2.—(a) Proper placement of a sticky board in an apple tree. (b) Close-up of the sticky board.

## Trap Monitoring

The traps should be visited every third day, once they have been placed. Proper monitoring involves more than just looking for the pest. Many other insects are attracted to the sticky traps and can make it difficult to find the pest insects. These should be removed with a twig or stick along with the maggot flies at each visit to the traps. When removing insects from the traps, care should be taken not to place the insects or sticky bait on the trees or vegetation in the orchard since the sticky bait is attractive wherever it is placed. Carry a cloth or piece of paper on which to place the insects for easy removal from the orchard.

Another part of monitoring is changing the traps every 2 weeks. For the first trap change, replace half the traps after 2 weeks and the other half the third week. This will begin a staggered replacement program that will insure having at least half the traps fresh. Although not required, some growers may wish to switch from sticky boards to sticky red spheres to monitor for apple maggot later in the season. The switch can be made from early August on. Placement and reading of the spheres are the same as for the boards.

## Fly Identification

Proper identification of the trapped maggot flies is essential. An error in identification can be very costly in the form of a maggot infestation or unneeded spray applications. Figure 3 shows the wing patterns of the cherry fruit fly, the black cherry fruit fly, and the apple maggot. Also shown are the wing patterns of several non-pest species that are similar to those of the pests including the walnut husk fly [*Rhagoletis suavis* (Loew)] which is frequently mistaken for the apple maggot. In addition to wing pattern differences, the body color of the walnut husk fly is paler than the apple maggot. If you are still uncertain after comparing the wing patterns with those in Figure 3, take the fly to your local fruit agent for identification.

For an indepth study of the apple maggot see: Dean and Chapman (1973), *Bionomics of the Apple Maggot in Eastern New York*, Search Agriculture, Volume 3, Number 10, which may be obtained by writing to the Bulletin Room, New York State Agricultural Experiment Station, Geneva, NY 14456.

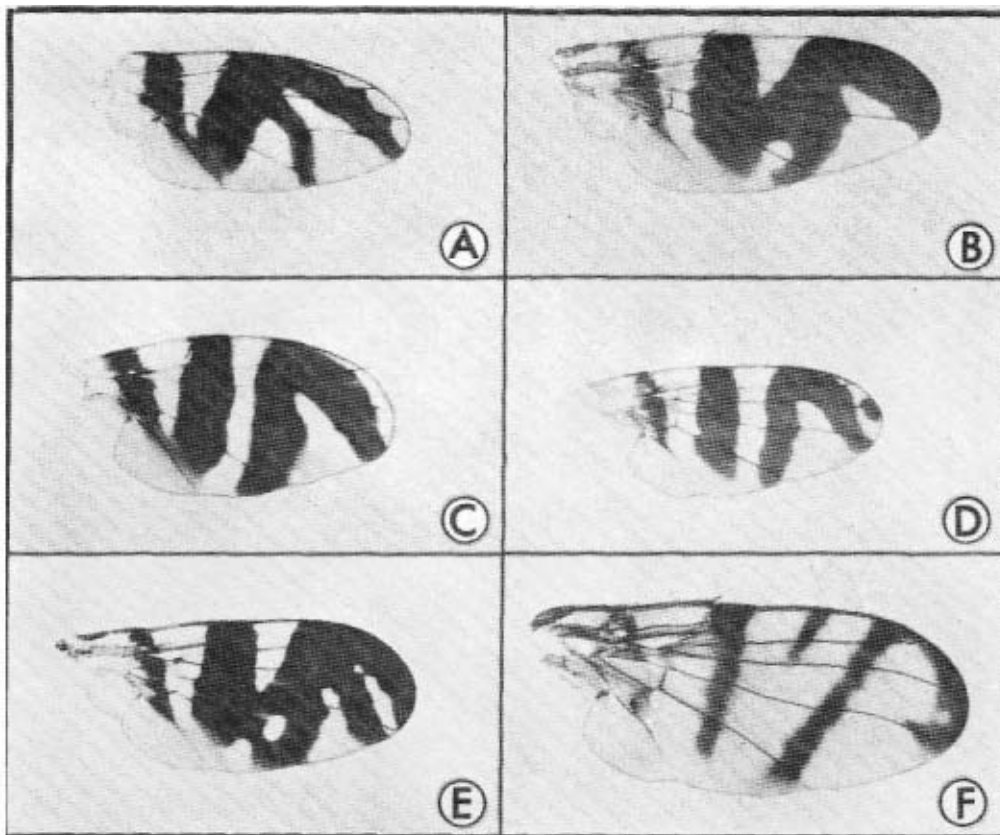


Figure 3.—Wing patterns for the apple maggot, cherry fruit flies, and several non-pest species that are similar to those of the pest: (a) *R. pomonella* (apple maggot), (b) *R. suavis* (eastern walnut husk fly), (c) *R. tabellaria*, (d) *R. cingulata* (cherry fruit fly), (e) *R. fausta* (black cherry fruit fly), (f) *R. basiola*. Wing pattern photographs were taken from Bush 1966. *The Taxonomy, Cytology, and Evaluation of the Genus Rhagoletis in North America (Diptera, Tephritidae)*; *Bul. Mus. Compar. Zool.* Vol. 139, No. 11.

WARNING: Sticky traps cannot be used with accuracy to determine spray timing in orchards that have apple maggot infestations. Such orchards should be sprayed on a regular 10 to 14-day schedule once the flies begin to

emerge.

For accurate use of the traps in maggot-free orchards, regular monitoring and maintenance of the traps are required.



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