Fruit-infesting Flies

Rhagoletis indifferent
There are two families of flies that may be known as “fruit flies”

**Fruit Flies**
Diptera: Tephritidae

**Small Fruit Flies/ Vinegar Flies**
Diptera: Drosophilidae
Western Cherry Fruit Fly / Eastern Cherry Fruit Fly

*Rhagoletis indifferentis*  
*Rhagoletis cingulata*  
**Diptera: Tephritidae**
Cherry Fruit Fly Hosts

• Western Cherry Fruit Fly
  – All cultivated and wild cherries
• Eastern Cherry Fruit Fly
  – Cherries (sweet, tart, black)
Larvae pupate under debris and in loose soil. This is the overwintering stage. One generation is produced annually.

Adults are usually first present and active when fruit is beginning to mature, about 5 weeks before harvest.
After mating, females lay eggs under the flesh of the developing cherries.
Cherry fruit flies are easily captured on yellow sticky traps
Traps used for western cherry fruit fly should have a protein hydrozylate bait incorporated with the trapping goo.
Spraying for Western Cherry Fruit Fly

- Treatments should be timed for periods when females begin to lay eggs
  - Trapping can identify activity periods
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- Spinosad based sprays or baits most accessible to homeowners
  - Entrust, Capt. Jack’s DeadBug, Monterey Spinosad
  - GF-120 (bait formulation)
Larvae develop in flesh of the fruit

When full grown they exit the fruit and drop to the ground
Ground Cover Management

- Dense understory plants (clovers, grasses)
  - Increases predation of pupae
- Fabric barriers
  - Prevents reaching soil sites for pupation
Larvae emerge from fruit, drop to the soil and pupate under debris and in loose soil.

This is the overwintering stage. One generation is produced annually.
Apple Maggot

*Rhagoletis pomonella*
Diptera: Tephritidae
Apple Maggot Hosts

- Hawthorn (native host)
- Apple
- Crab apple
- Cherries
- Plum
- Pear (rare)
Adults insert eggs just under the surface of fruit. Dimpling wounds become evident as the fruit develops.
Larvae tunnel through the flesh of the apple. A name sometimes used for these insects is “railroad worms” because of the dark tracks they produce.
The pupa is the overwintering stage. It occurs under covering debris or in loose soil very near a previously infested tree.

A, Life stages: a, adult; b, pupa; c, larva, or maggot. (All about three times natural size.) B. Adult female making egg puncture in an apple. C. Exterior evidence of maggot damage. D. Halved apple showing damage to flesh and d, maggots feeding inside. (B, C, and D, about natural size.)
Yellow sticky cards can be used to monitor flight activity of adult apple maggot.
Traps can be used to control apple maggot.

The “Super Apple” Trap
Spottedwing drosophila (SWD)

*Drosophila suzukii*

Diptera: Drosophilidae – the “vinegar flies” or “small fruit flies
Most *Drosophila* feed on yeasts – they are the common “fruit flies” of overripe fruit.

A homemade trap for small fruit flies

Small fruit fly larvae developing in overripe banana
Males of can be distinguished by a spot on the wings.
SWD lays eggs on intact, ripening fruit
Life Cycle of the Spotted Wing Drosophila

*Drosophila suzukii* (Matsumura)

- Pupation: 4-15 days
  - Inside or outside of fruit
- Three Larval Instars: 5-7 days
- Eggs: 12-72 hours
  - 350+ eggs in a lifetime
- Adults: 20-30 days
Infestations of the developing larvae rapidly soften the fruit.
Spottedwing Drosophila – What To Look For

• Small maggots in ripening fruit
  – Rapid fruit softening results from injury
  – Raspberries, blackberries, strawberries most likely to be noticed as infected
• Adult male has a spot on the wings
Cups filled with apple cider vinegar (or merlot wine!) effectively capture SWD
Traps are best placed in a shaded area within the crop canopy

Traps for Spottedwing Drosophila
Management of Spottedwing Drosophila

• Thoroughly and frequently pick ripening fruit
  – Store in refrigerator/rapidly use fruit
  – Destroy culled fruit in manner that kills developing larvae

• Shift to early bearing cultivars

• Insecticides
Control of SWD

Thoroughly pick all ripe fruit regularly (2-3X weekly)
Many fruits are hosts of spotted wing drosophila.

Question: How important are the fruits produced by trees/shrubs as food sources for this new insect pest of berry crops?
Host Range Survey of SWD Hosts – Preliminary Results

• **Highly susceptible**
  – Raspberries, blackberries, strawberries

• **Support some SWD**
  – Honeysuckle, elderberries, yew, ripe apples/crabapples, hawthorn, at least some cotoneaster, ........

• **Apparently do not support SWD**
  – Russian olive, viburnum
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• Insecticide?
  – Spinosad
  – *Only applied at evening after bees cease visiting!*
Insecticides used for spotted wing drosophila must only be applied at dusk, after bees have stopped foraging for the day.