EASY AS 1-2-3: ORIENTAL FRUIT FLY

Fruit Fly Suppression for the Commercial Grower

Welcome to the HAW-FLYPM team! Our goal is to promote a sustainable suppression program using an "area-wide" approach to managing fruit flies, while introducing environmentally acceptable and cost-effective technologies that address grower needs. Through HAW-FLYPM, we intend to increase economic benefits to growers, the community, and the state of Hawaii through expanded opportunities in diversified agriculture.

We hope that you will use this simple guide to learn about fruit flies and help manage these pests in your farm. Fruit fly suppression can be as simple as 1-2-3: Sanitation, Monitoring and Protein Bait!

ORIENTAL FRUIT FLY IDENTIFICATION & BEHAVIOR

It's important to know which species of fruit fly you have in your farm.
Incorrect identification can result in ineffective pest control measures.

ORIENTAL FRUIT FLY

Identifiable Traits:

Clear wings

In most elevations, sea level to 4000-foot elevations

Hosts

Most fruits
Breadfruit
Carambola
Cherimoya
Citrus
Guava
Mango
Peach
Papaya

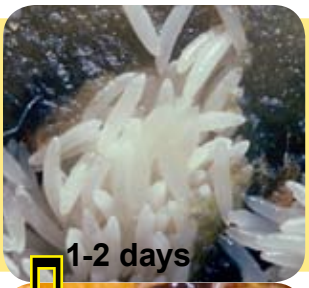
Oriental Fruit Fly Behavior

Oriental fruit fly adults remain within orchards and crop fields. Adult fly behavior is affected by temperature. On cooler mornings, flies warm-up on top of leaves. In warmer temperatures, flies tend to avoid the sun and stay inside foliage. Fruit flies are active from after sunrise to mid-day, up until mid-afternoon depending on the temperature. They usually mate late in the afternoon as the light intensity drops and sleep among the leaves in the evening.

GENERAL FRUIT FLY LIFECYCLE

ADULT STAGE

Flies emerge from pupae between 7-10:00 in the morning and become sexually mature within 25-35 days. Once they have mated, females sting produce to deposit their eggs and the cycle begins again.



EGG STAGE

Eggs are deposited by the adult female in the fruit or vegetable. A female Oriental fruit fly can lay as many as 1000 eggs in her lifetime. Eggs hatch within 24-48 hours.

PUPAL STAGE

In the soil, larvae form a puparium which protects the insect until it develops into an adult.

LARVAL STAGE

Larvae hatch from eggs and tunnel through host fruits and vegetables. Larvae emerge from the fruit and burrow in soil.

We're online! Visit us at www.fruitfly.hawaii.edu for more information

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Suppression Tactic #1

FIELD SANITATION

Sanitation is the disposing of infested fruit so fruit fly eggs and larvae do not survive. It is one of the easiest suppression methods, and a very important one for two reasons: 1) An infested fruit may hold hundreds of larvae and/or eggs; by getting rid of that one fruit, you are eliminating future fruit fly swarms, 2) Pesticides applied to fruit do not kill larvae and eggs. Sanitation destroys infested fruit to KILL FRUIT FLIES.

Sanitation Techniques

Plow the field 1 week after crop harvest

Bag culls in thick plastic bags

Bury infested fruit 18 inches deep

Feed but do not leave leftovers around for over a day

Suppression Tactic #2

MONITORING TRAPS

Monitoring helps growers make good pest management decisions. Fly catches in monitoring traps not only determine fruit fly populations in the area, but also help reduce the number of flies in your farm area!

The keys to successful monitoring: 1) Correct lure, 2) Good trap placement, 3) Timely trap maintenance

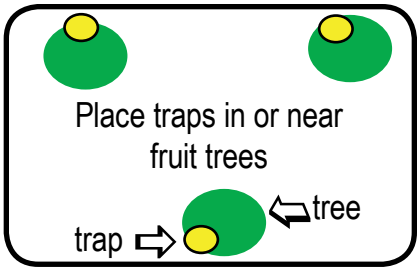
Number of Traps

5-7 traps/acre
(10-18 traps/hectare)

Male Lure

Methyl Eugenol
in basket

Trap Placement



Hang traps as high as possible

Trap Service

Replace lures every 4 months, or after 6 months if in shade

Suppression Tactic #3

PROTEIN BAIT SPRAYS

Fruit flies need sugars for energy and proteinaceous food to mature and reproduce. In nature, they turn to nectars (sugar) and bird feces and yeasts (protein). Protein baits attract and poison feeding male and female fruit flies. Such sprays are intended for fruit fly control and are most effective when used with other suppression methods. **GF-120 Fruit Fly Bait Concentrate®**, a combination of protein bait and spinosad insecticide is very safe to humans. Not labeled as a restricted-use chemical, GF-120 NF is listed for use in organic production.

Protein Bait Preparation

GF-120 is designed for low volume and low toxicity application. The recommended dilution ratio ranges:

1 part GF-120 to 4 to 10 parts water

The GF-120 solutions are used as sprays. They should not be stored for future applications as the mixture quickly breaks down. Spray bottles should be washed thoroughly after each use to prevent clogging.

Application Rates

Fruit tree or roosting host/border sprays:
-Several spot sprays per tree/10' foliage
-1/4-1 oz. GF-120 solution per tree/10' foot border crop

Don't forget to follow GF-120 label instructions

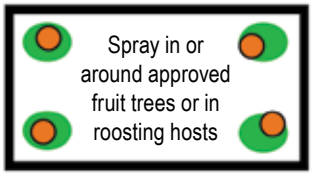
Protein Bait Application

Growers apply approximately 1/4-1 ounce of spray to each tree in several "spray spots" or every 10 feet in border crops or roosting hosts. Adjust the amount of spray according to severity of infestation and amount of foliage requiring spray coverage.

The thicker GF-120 mixture at 1 part GF-120 to 4 parts water may be "painted" inside lightweight buckets and hung upside-down in very humid, rainy areas. These buckets require cleaning and bait re-application should the bait become moldy.

Recommended Roosting Hosts

Fruit fly-preferred hosts include Cassava, Castor Bean*, Christmas Berry, Cocklebur, Corn*, Hibiscus, Panax, Sudex*, Ti and Wiliwili.
*Most preferred roosting hosts



Protein bait works best when applied to the underside of leaves every 7 days. Re-apply after rain.

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