

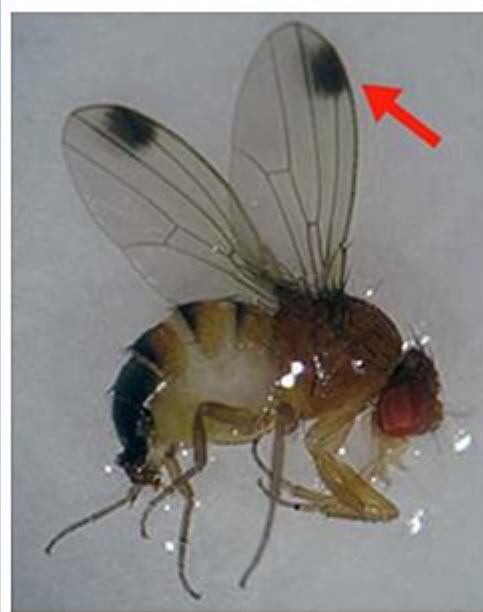
Management Research Updates: Spotted Wing Drosophila

Mark Bolda

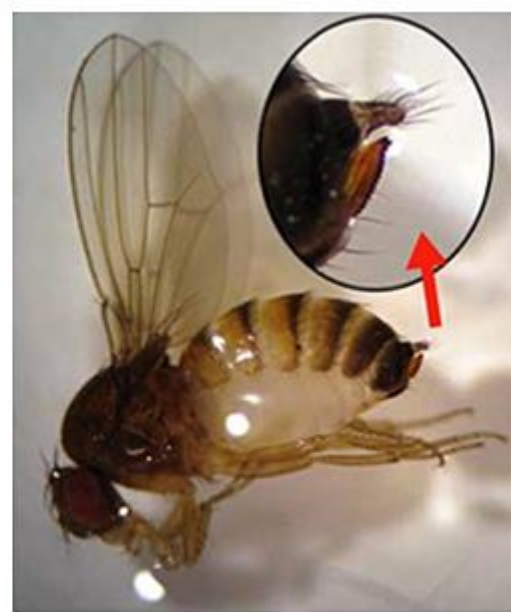
UCCE Santa Cruz County

July 28, 2020

Spotted wing drosophila (SWD)



SWD Male – note the characteristic dark spot near the tip of each wing.



SWD Female – note the saw-like egg-laying structure (insert); lacks wing spots.

General Rules for SWD Management

- Detection of flies through trapping in the field.
- Use of an effective insecticide applied in a timely manner to invading populations.
- Sanitation of fruiting fields important to keeping populations down, especially in organic culture.

Introduction: Three studies

- ISCA HOOK bait and kill
- Jet Ag for reduction of food supply
- Mainstay Si for egg laying interference

Why bait and kill?

Vitals

- Weekly applications of ISCA HOOK bait and kill made on September 6, 13, 20 and 26.
- Biweekly applications made September 6 and September 20.
- Rate at 1.5 L per acre.
- Replicate plots sizes are large; 15,750 ft sq.
- Material distributed with whisk broom at the base of the hedgerow.
- Two insecticide applications made during duration of study, once 9/8/2018 and then again on 9/22/2018.

Evaluation

- A Bug vac operated over 18 feet of row (distance between one set of stakes) from the middle row of the middle tunnel was used to evaluate number of adults per treatment replicate.
- Larvae and eggs were counted in the salt water test from 5 market maturity fruit which were taken from middle tunnel of each treatment replicate.
- Sampling for both fruit and adults took place 9/5 (pre-application sample), 9/24, 10/3 and 10/10.

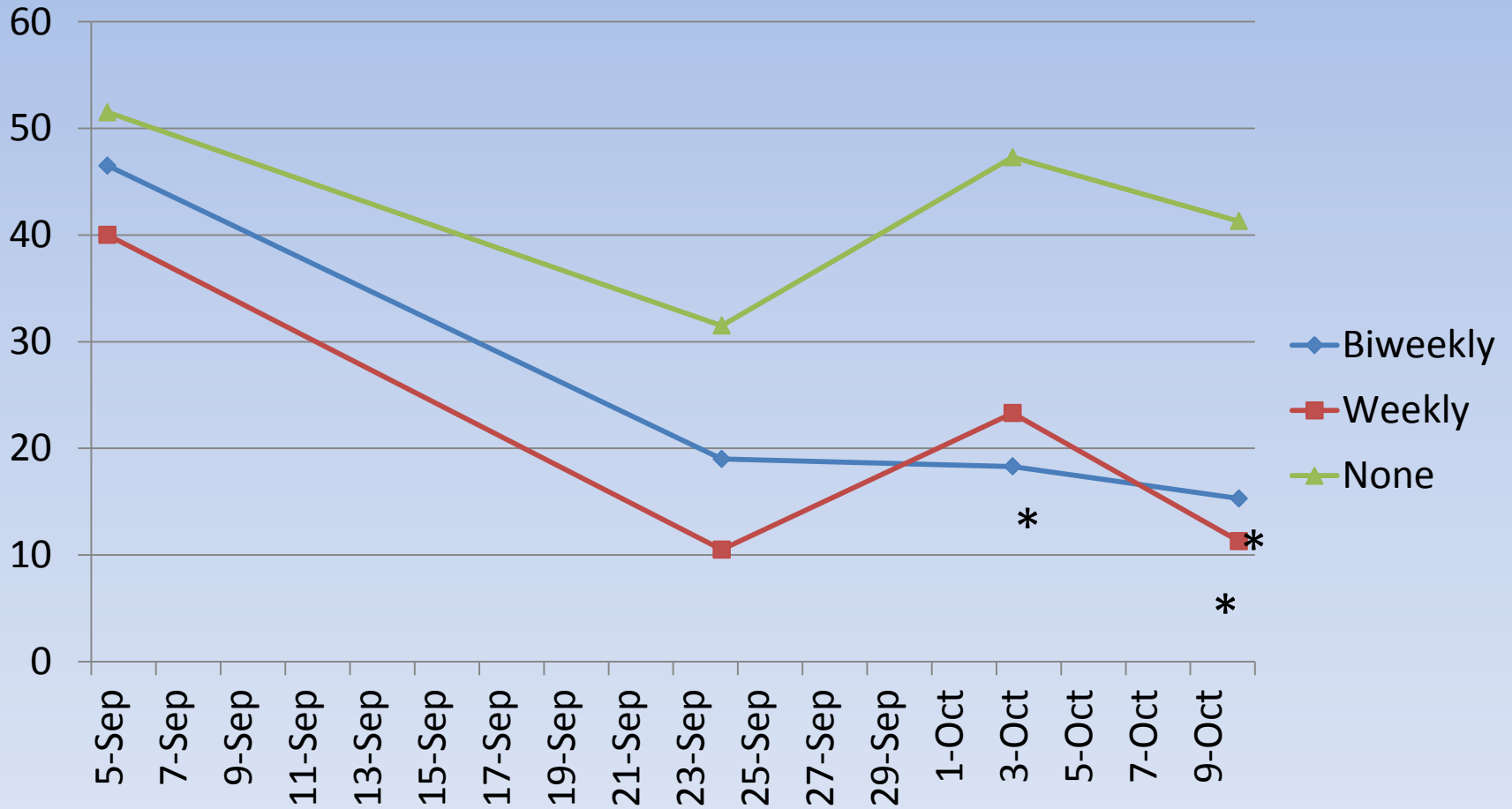


Freshly applied ISCA HOOK, 9/24/2018

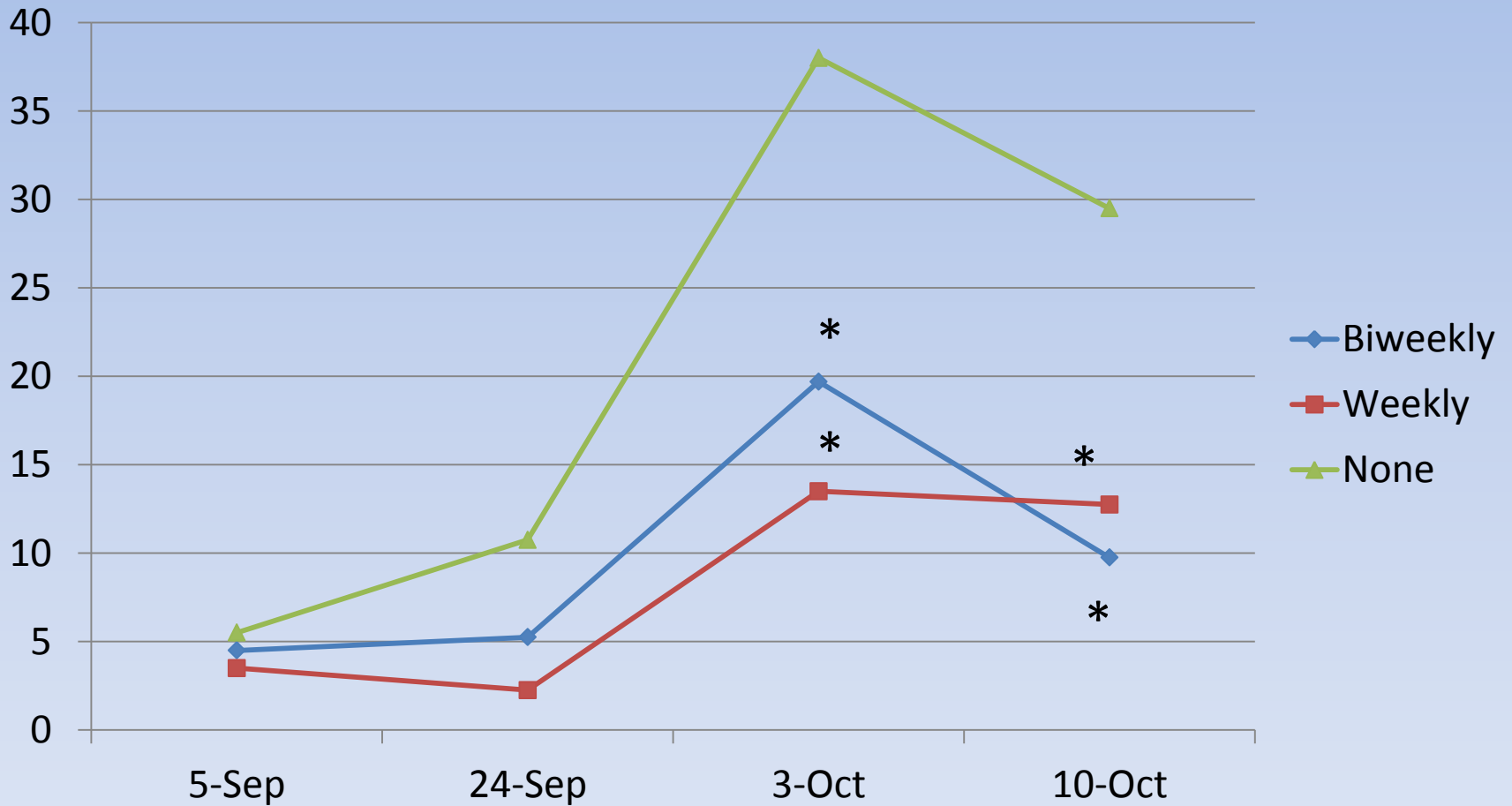


ISCA HOOK Oct 10, 2018

Adult SWD per Treatment



Larvae per five blackberry fruit



JetAg (peroxyacetic acid)

- Diminution of larval food supply of yeast to reduce SWD populations in the field.

The results from this trial indicate there may be a fit for Jet-Ag as a rotational partner in an insecticide program. It should be noted that the bushes used in this trial are of moderate size and are planted with black weed fabric under the bushes. Fields with larger bushes and/or more weed growth under the bushes may have higher in-field SWD than in this trial and could potentially end up with different results than those found in this trial.

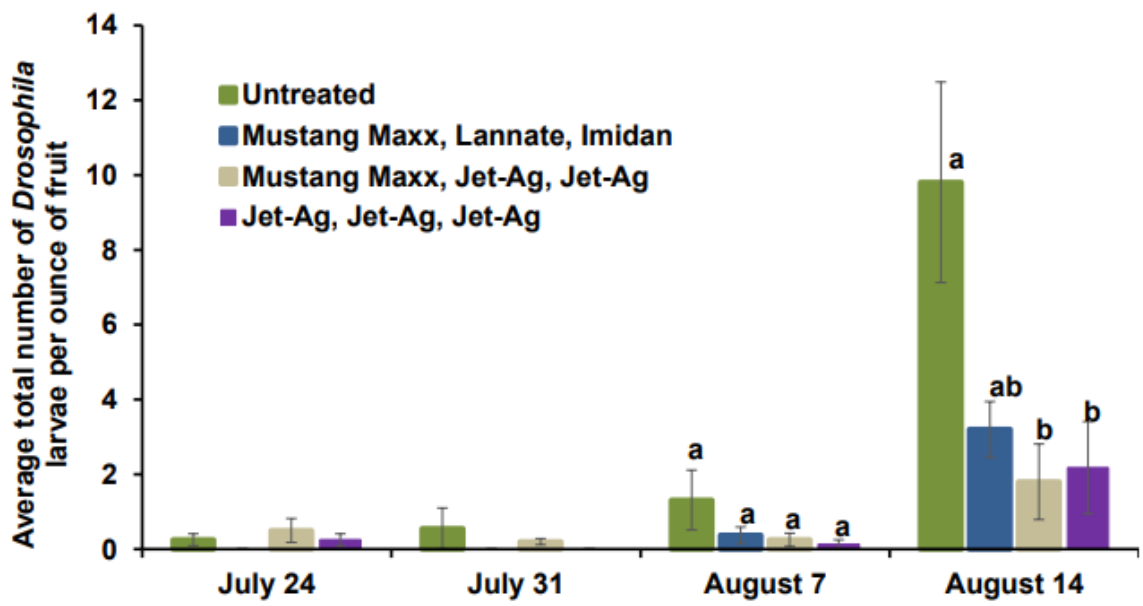


Figure 1. The average total number of *Drosophila* larvae per ounce of ripe fruit. Ripe fruit samples were collected from blueberry bushes treated with one of three insecticide programs or were left untreated. Averages are presented \pm SE and averages with different letters within each week are statistically different at an alpha value of 0.05.

Jet Ag spray

- 1 gallon applied per 100 gallon water carrier
- One treatment replicated four times on commercial blackberry operation.
- Application 8/21/2019 with hand held pistol sprayer off of gas powered backpack.

Data collection

- Hand held bug vac over 18' of row from each replicate.
- Collection of 10 marketable fruit from each replicate, held at room temp for 3 days and larvae counted.
- First collection before spray on 8/21/2019, next collection six days later on 8/27/2019.

Test Field



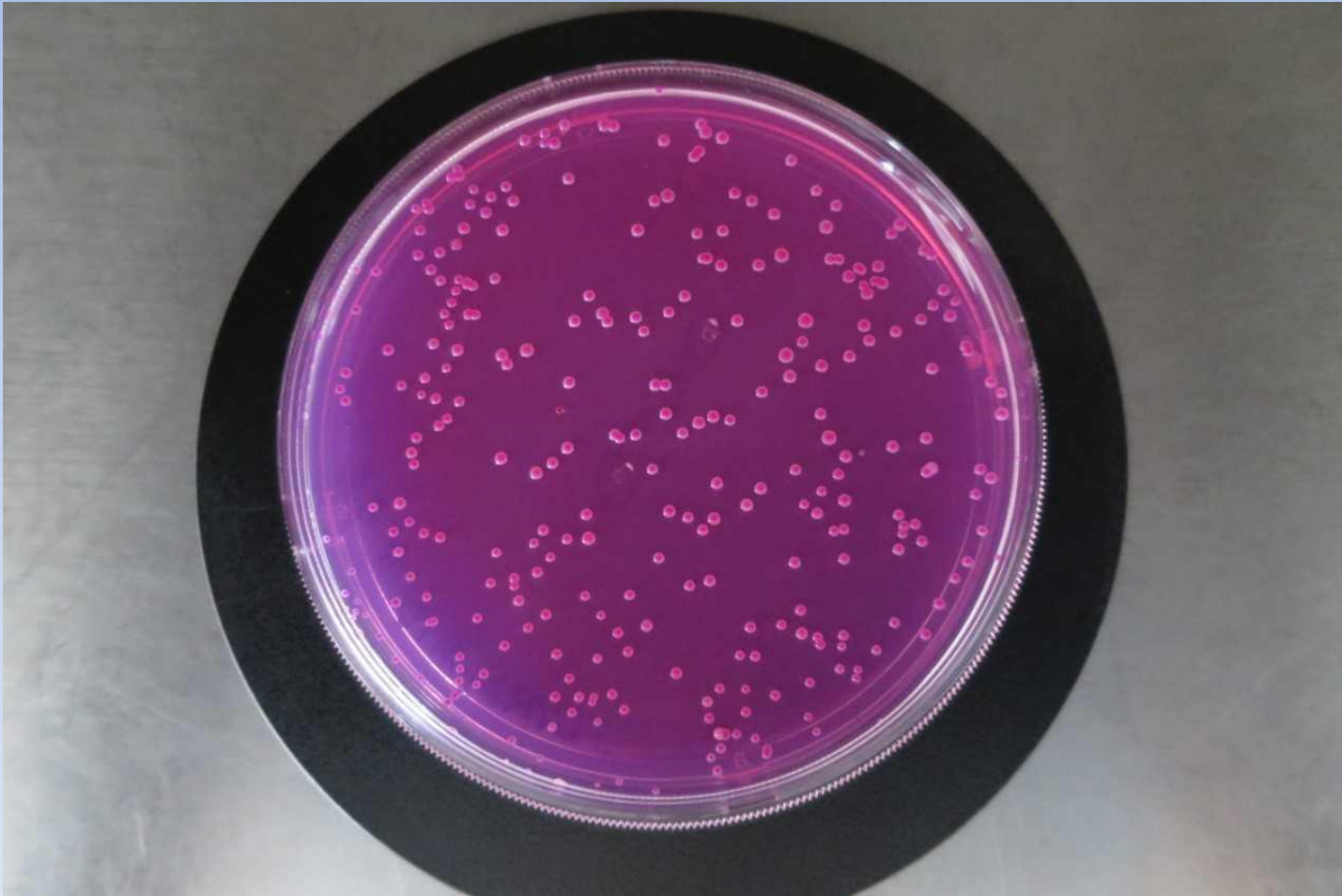
Data collection for yeast

- 10 fruit collected into sterile bag from each treatment replicate before and after spray.
- Fruit sent to UC Davis plant pathology laboratory for yeast and filamentous fungi enumeration and evaluation.

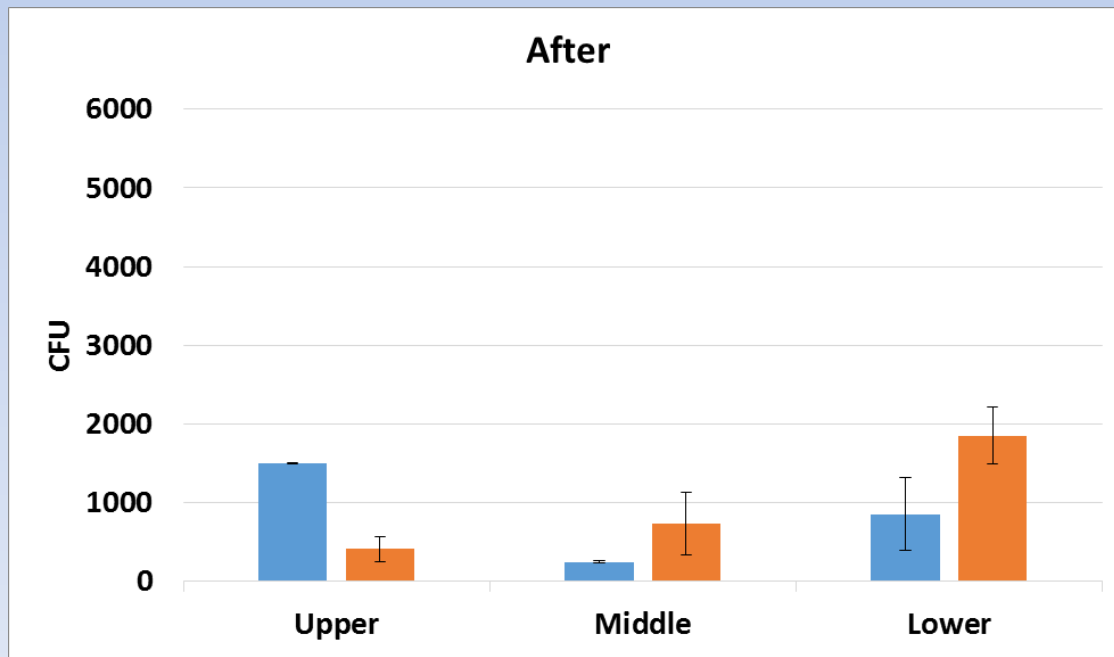
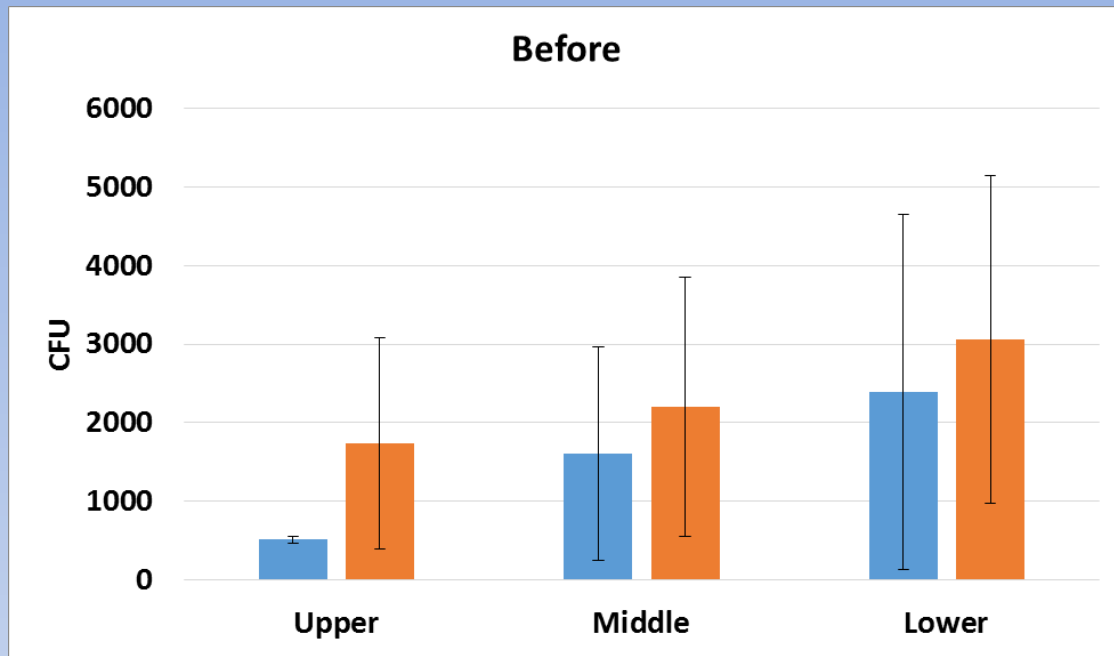
Collection and Evaluation of fruit for Yeast and Filamentous Fungi



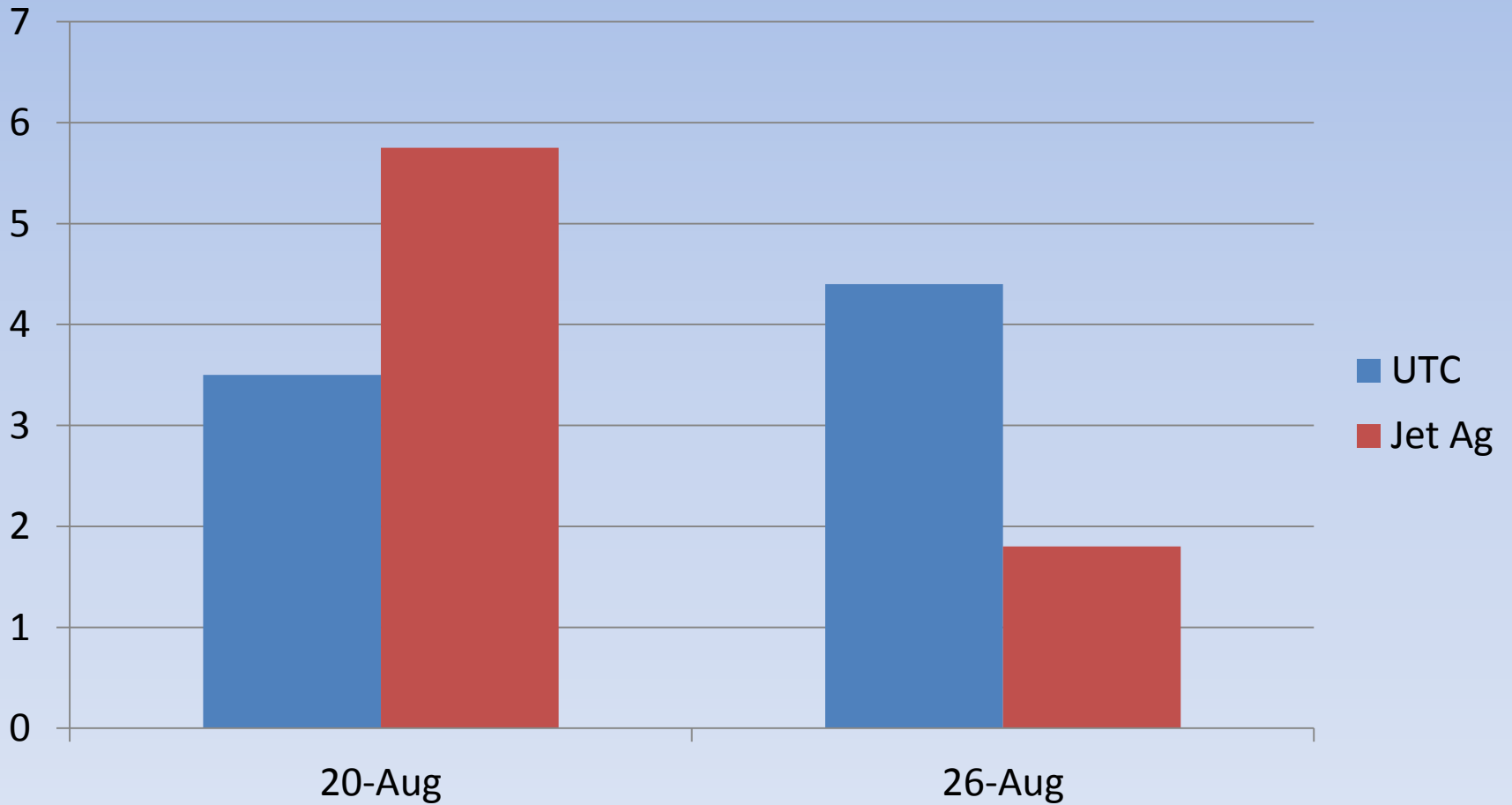
Yeast evaluation and enumeration



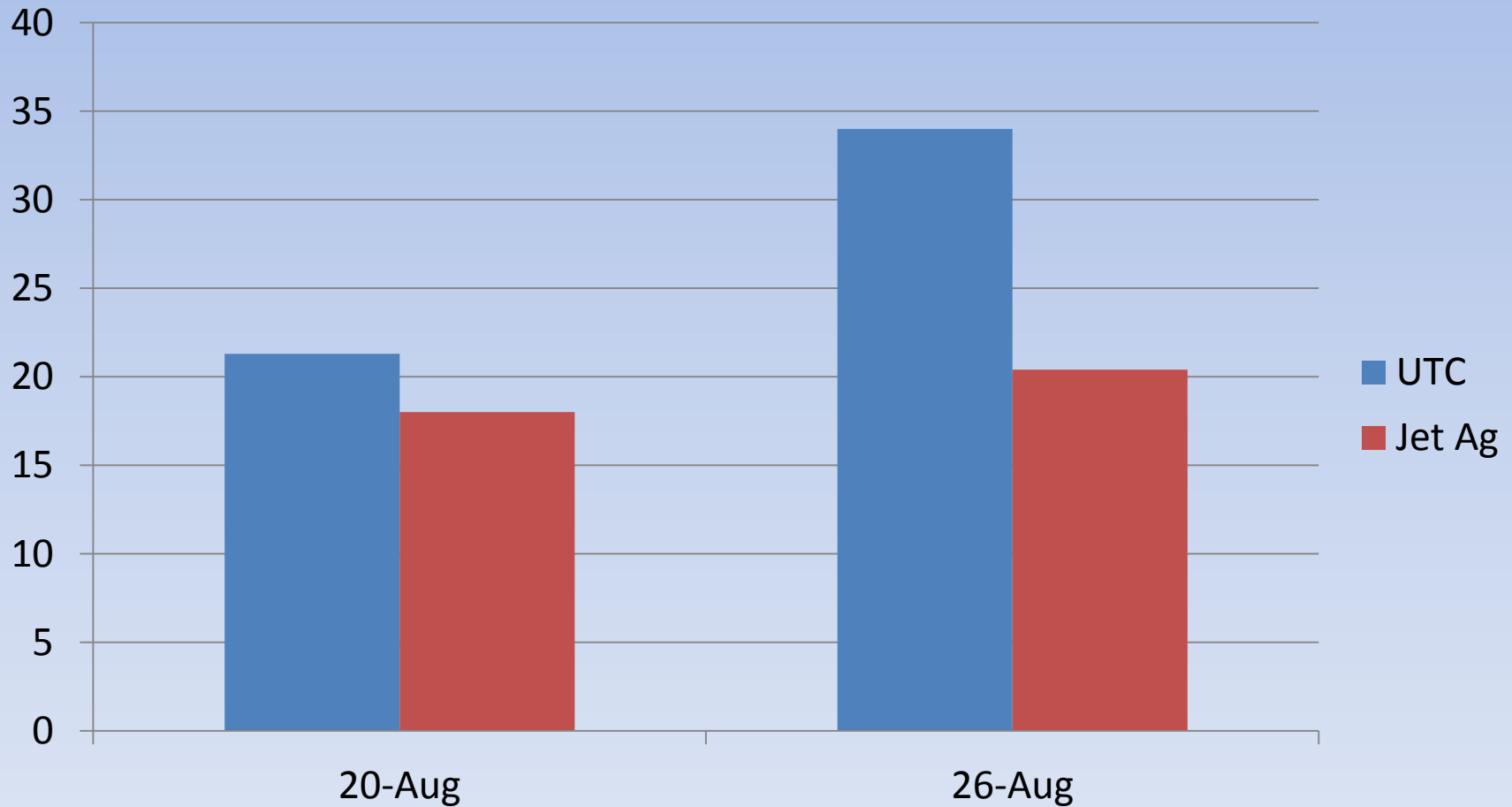
Blue = untreated
Orange = treated



SWD Larvae in 10 fruit



SWD adults total per 18 feet of row



Use of Mainstay SI Organic (calcium derived from silicate + silicon dioxide) to Interfere SWD activity on fruit egg laying

- 1 gallon applied per 100 gallon water carrier
- One treatment replicated four times on commercial blackberry operation.
- Application 8/21/2019 with hand held pistol sprayer off of gas powered backpack.

Concept








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MainstaySi Organic

GUARANTEED ANALYSIS

Calcium (Ca)..... 10%
DERIVED FROM CALCIUM SILICATE
ALSO CONTAINS NONPLANT FOOD INGREDIENT
22%..... Silicon Dioxide (SiO₂)
DERIVED FROM CALCIUM SILICATE

F001388

KEEP OUT OF REACH OF CHILDREN

SHAKE OR AGITATE WELL BEFORE USE

GENERAL INFORMATION:
Mainstay Si Organic is a general plant nutrient designed for soil and foliar applications.

APPLICATION GUIDELINES:

- Proper application rates and frequency should be determined by specific conditions and plant requirements.
- Always jar test before adding to a spray tank or injection tank.
- Spray and fertigation applications should be made with sufficient water, 50 mesh

APPLICATION RATES:

APPLICATION	RATE
Soil	0.25 - 5 gal./acre

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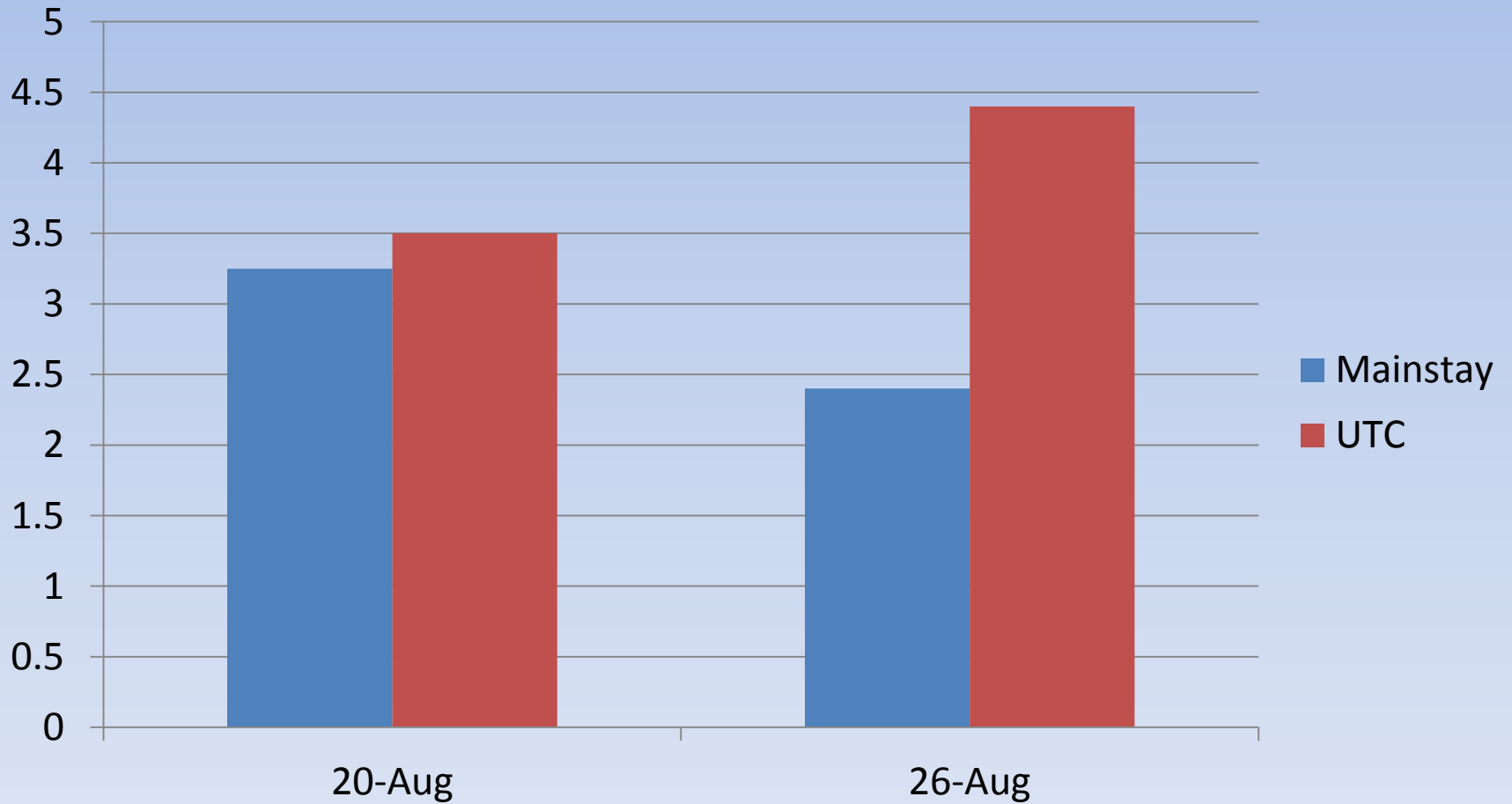
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Causes skin and eye irritation.

Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Specific treatment (see on this label). Take off contaminated clothing and wash before reuse. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. IF ON

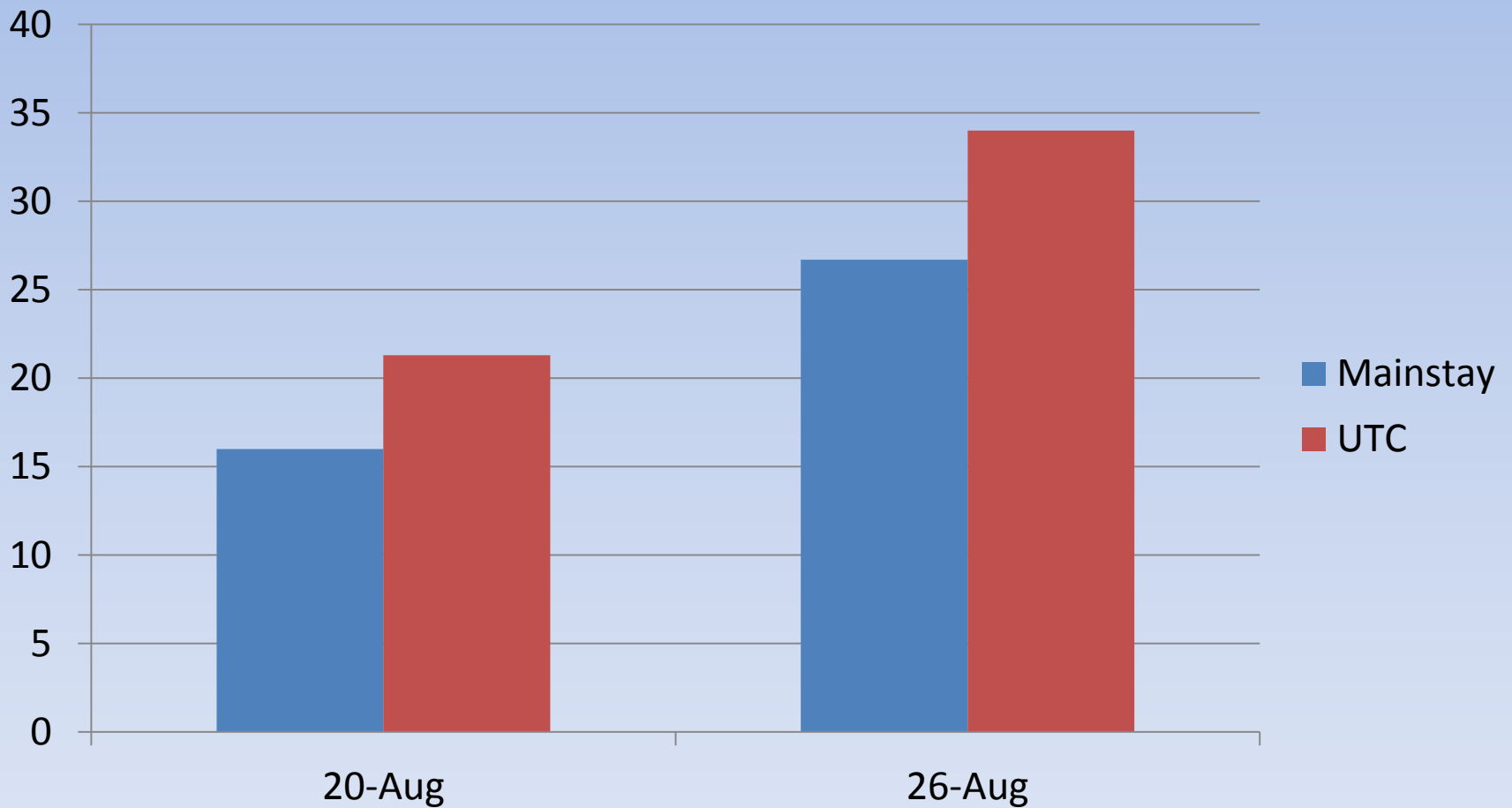
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SWD Larvae in 10 fruit



SWD adults total per 18 feet of row



Mainstay residue?



Concluding Thoughts

- Would be interesting to do multiple sprays of JetAg on active SWD population.
- Would be interesting to do multiple sprays of Mainstay – perhaps at a higher rate than that tested here – on active SWD population.
- Will be following the registration of ISCA HOOK.

Questions:

- True or false: Trapping and use of an effective insecticide is all what is needed for good SWD management.
- True or false: Reduced exposure to pollinators is one advantage of the bait and kill approach in SWD management in berries.