Spotted Wing Drosophila: Year-round Population Monitoring and Impacts Long Island, NY

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Photo by Faruque Zaman

Presentation Outline

- Year-round SWD monitoring: 2011 – 14
- Crop damage and risk assessment
- Cultivated and wild fruit utilization by SWD
- Post harvest storage and cold treatment

Background Information

Native to southeast Asia

First reported in 1939 in Japanese literature

Also known as vinegar fly, cherry fruit fly or wine fly

Found in Asia, Europe, Central America, Canada, and the United States

Established in Hawaii in the 1980s

Detected in continental U.S. in 2008 in Santa Cruz County, California

Has since been detected in 37 states in the U.S.

SWD in NY Spotlight

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Pesky Asian fruit fly threatens late-sea berries in Hudson Valley

khud.com (13 hours ago) Sep 9, 2013

An Asian fruit fly that caused millions of dollars worth of damage to cherry crops on t Coast has made its way east and has now been found all over New York, closing in o Lower Hudson Valley counties. FULL STORY

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New York grape growers warned of two new pests

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By The Grower staff

Damaging Long ×

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NEWS

Fruit Flies Damaging Long Island Berry Crops, Could Cause Price Hike

Expert: "There Will Be A Financial Impact On Both Industry And Consumers"

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Monitoring SWD Adults

2012- Apple cider vinegar (ACV) bait
2013 - 14 ACV + yeast-sugar mix (2014 data in progress)

- **Deli cup, 5 mm holes near top**

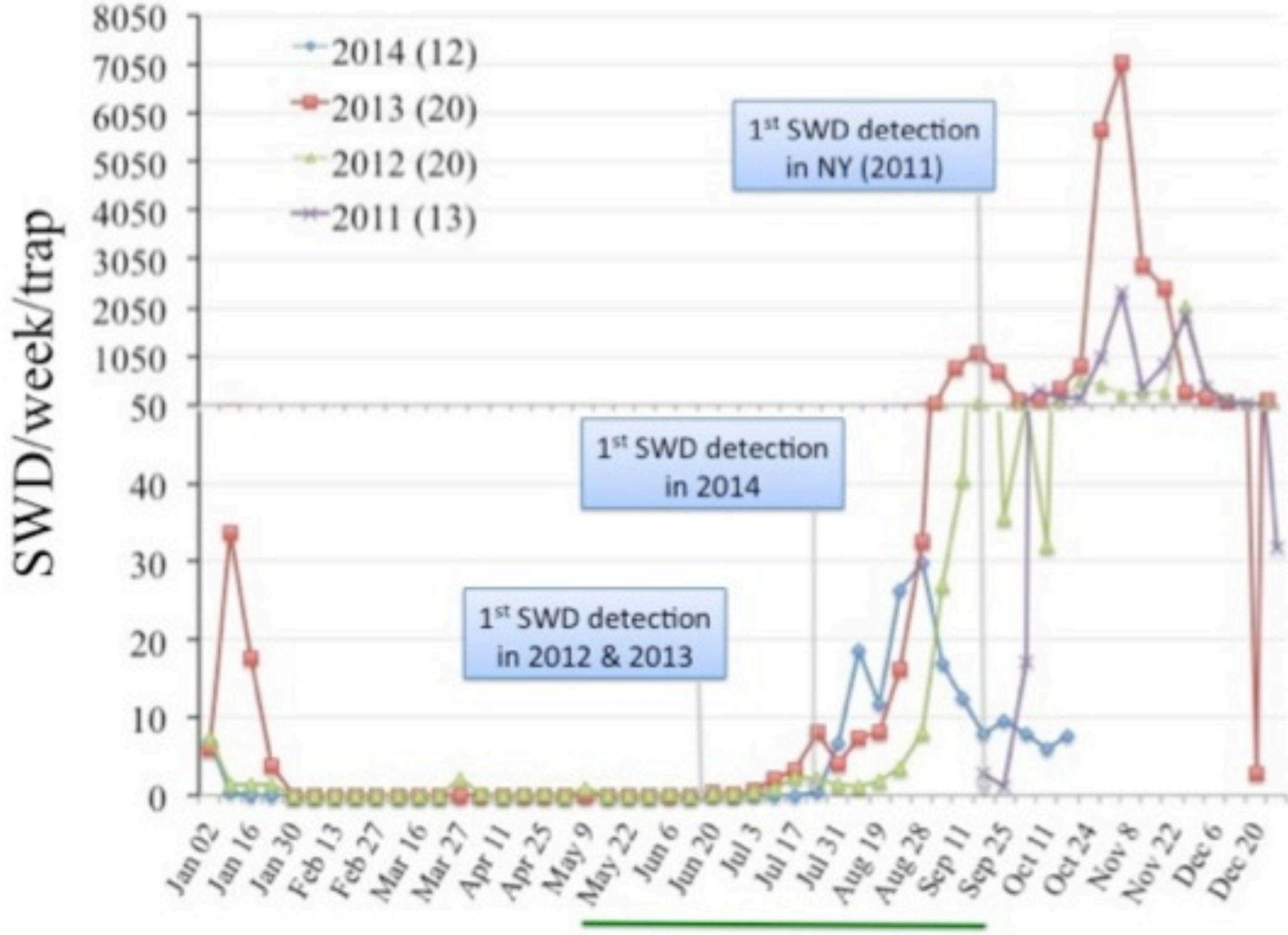
- 1 – 2” **apple cider vinegar bait, with a drop of unscented soap**

- **Hang in fruit canopy near fruit and in the shade**

- **Filter vinegar to collect adults**

- **Check weekly**

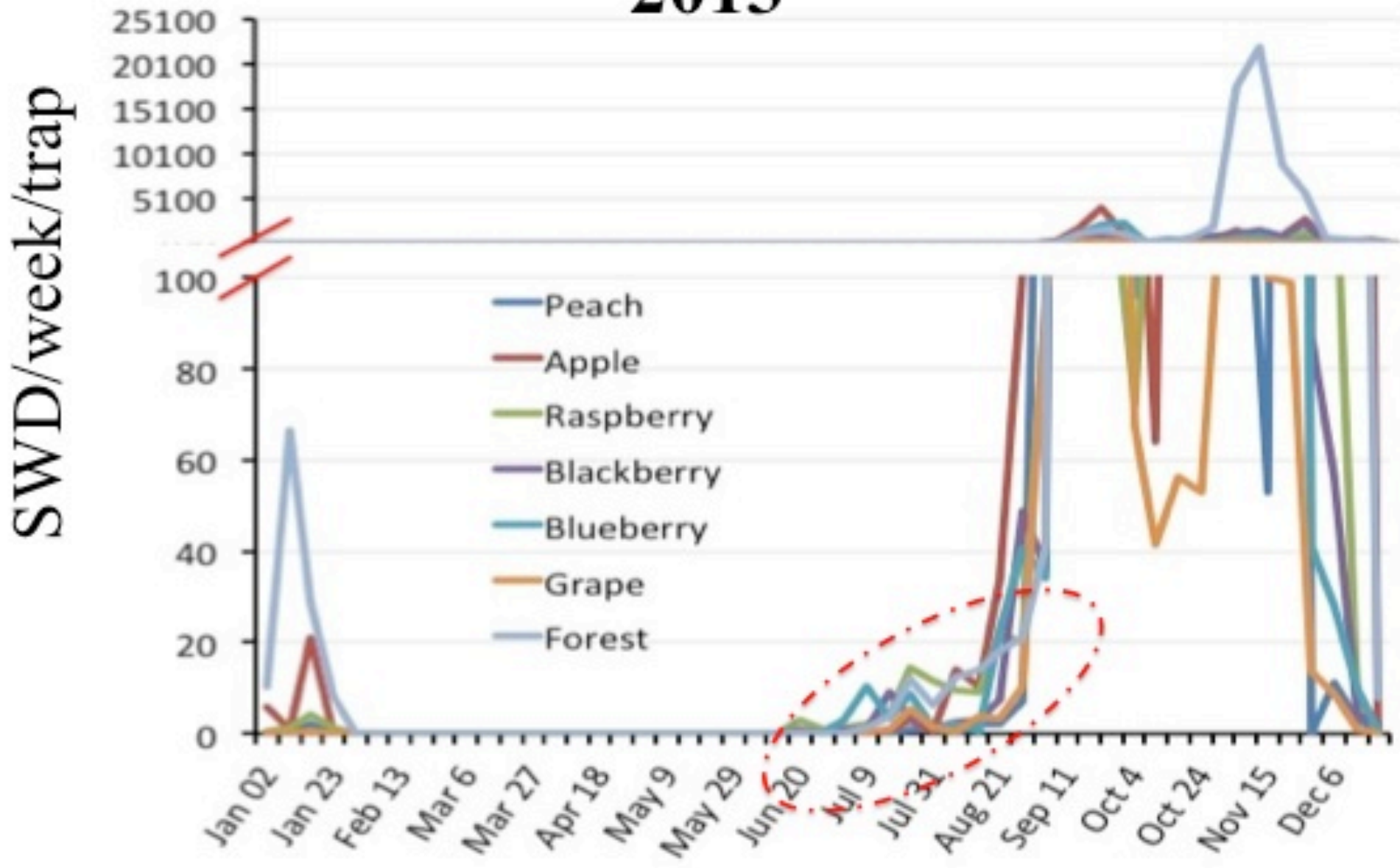
SWD Trap Counts on Long Island, 2011 - 2014



Numbers of traps in parentheses. Bait used: 2012- apple cider vinegar, 2013 - 2014 ACV + yeast and sugar.

Average weekly SWD captured in traps set at various fruit plantings and adjacent forests on Long Island

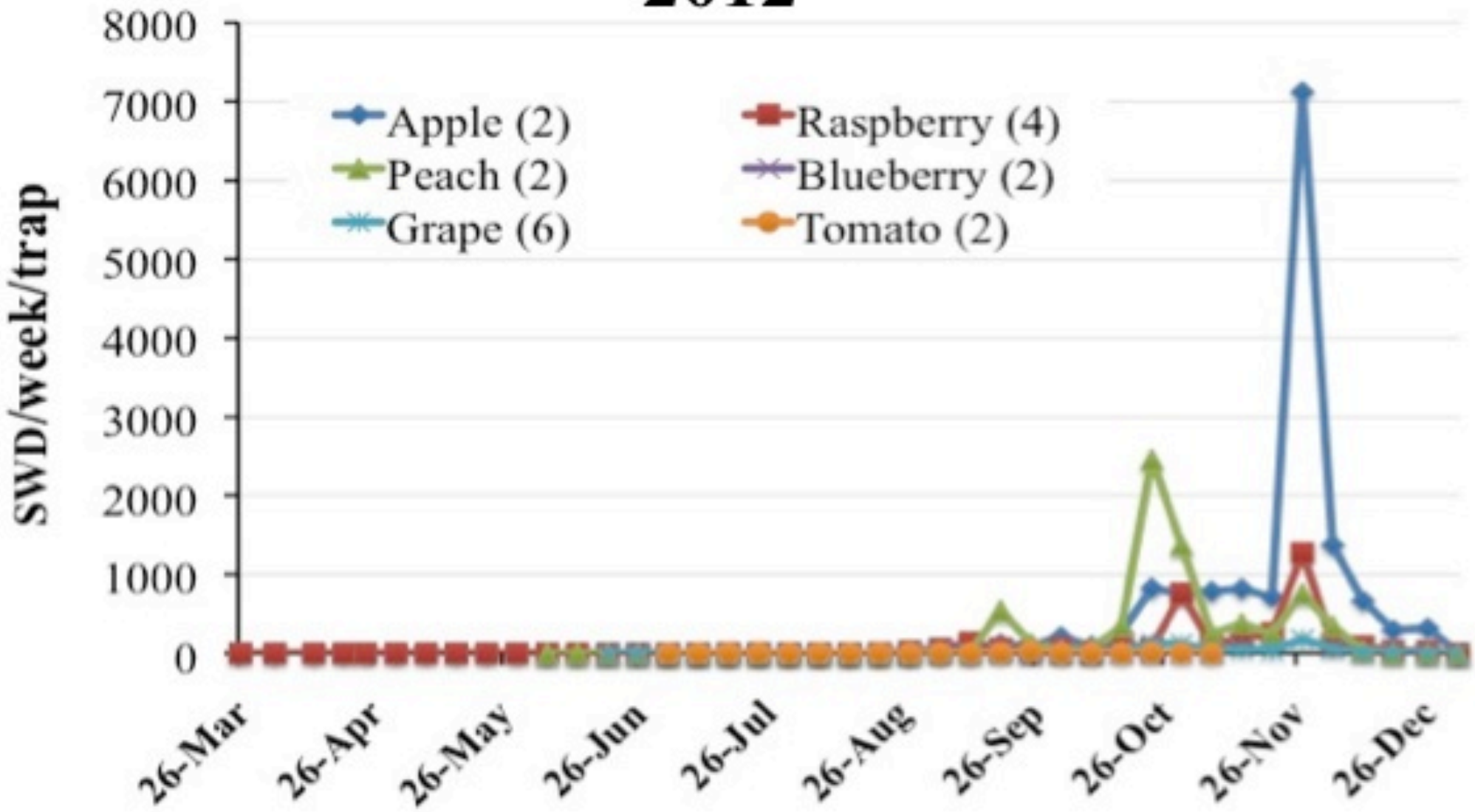
2013



Note: Traps in vineyards have captured the lowest number of SWD

Data from F. Zaman, 2013

Average weekly SWD captured in traps set at various fruit plantings on Long Island



Numbers of traps in each crop in parentheses

Data from F. Zaman, 2012

Crops and wild hosts assessed for SWD infestation: Long Island 2012-13

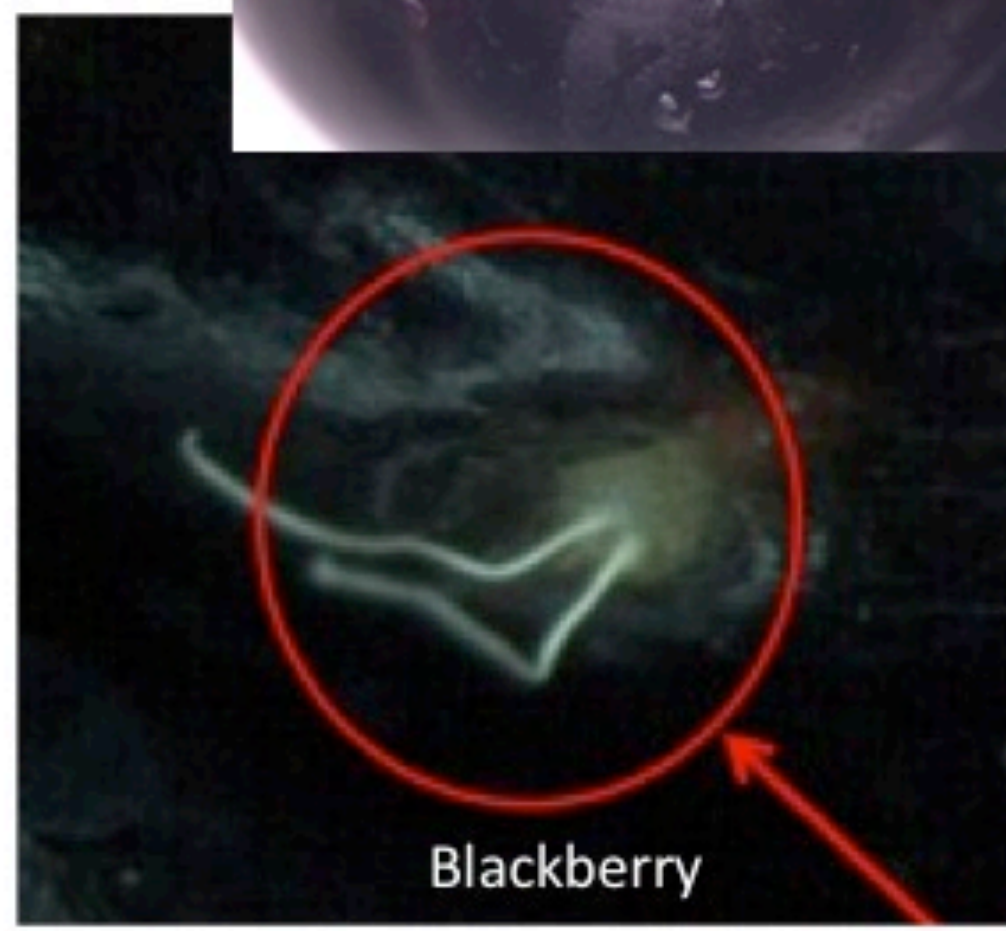
Crops*

Raspberry
Blackberry
Blueberry
Grape

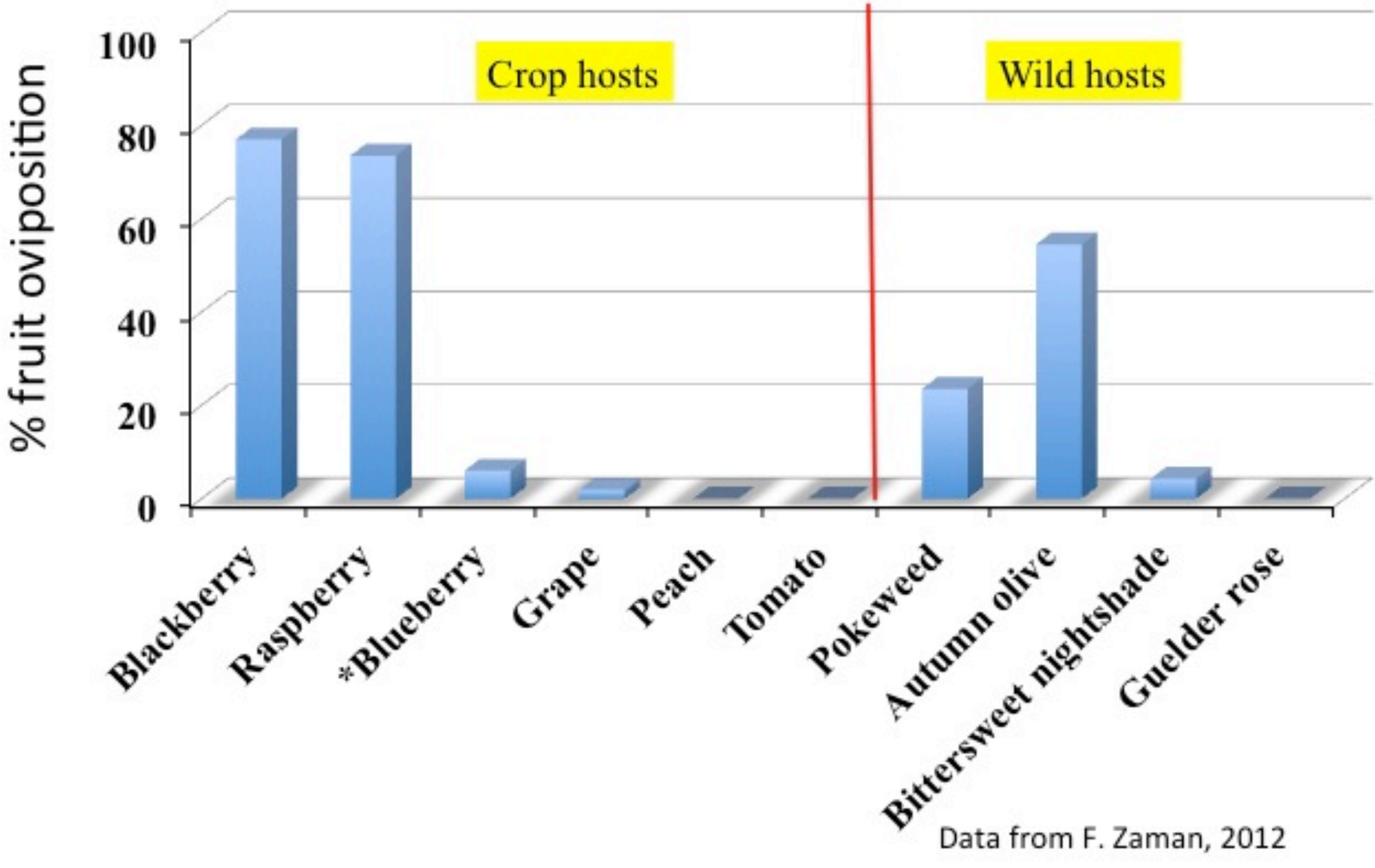
Wild hosts*

Wild black cherry
Pokeweed
Autumn olive
Dogwood
Bittersweet nightshade
Yew

* In Long Island samples

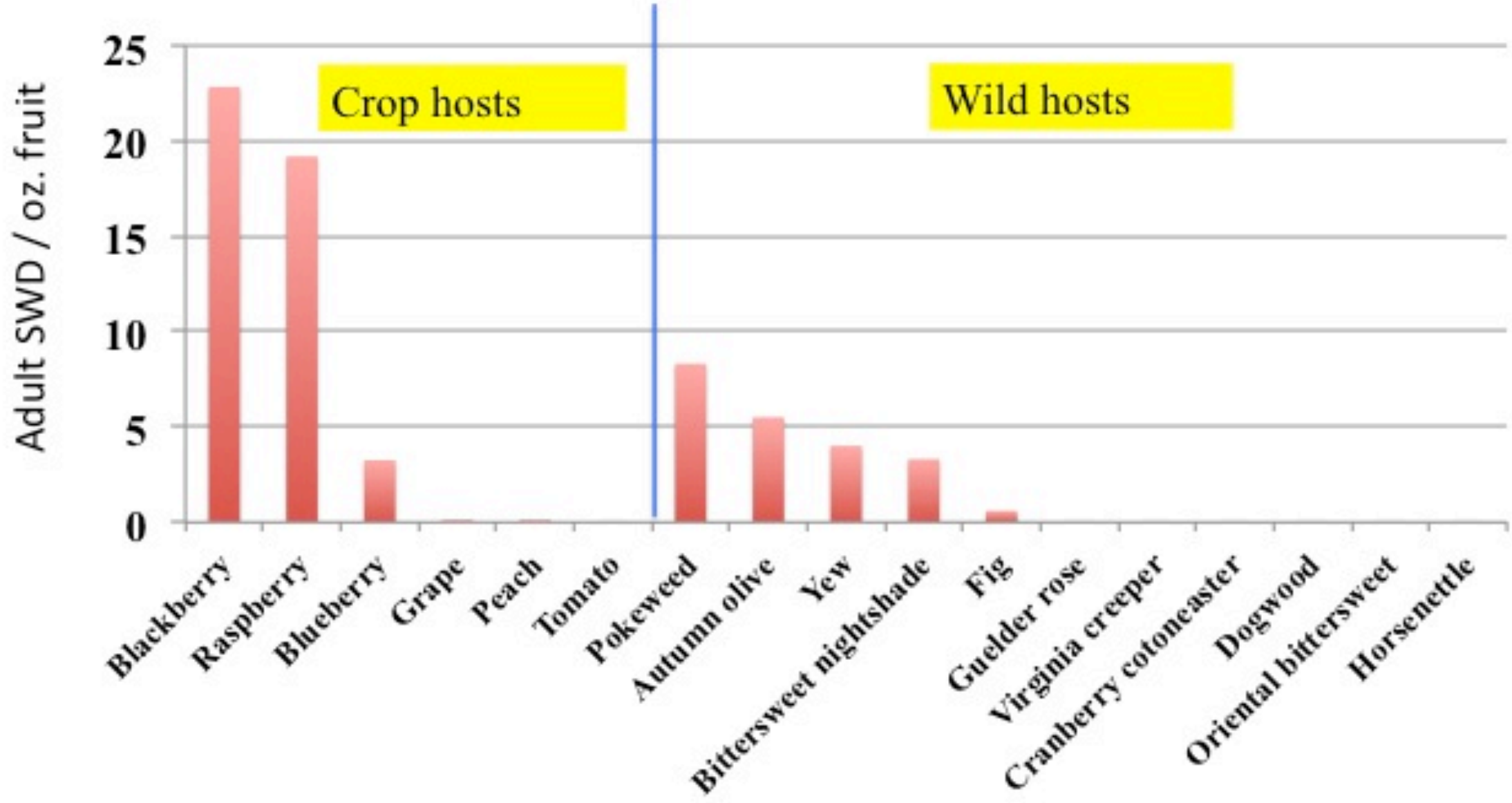


Fruit and wild berries oviposited or egg laid by SWD -2012



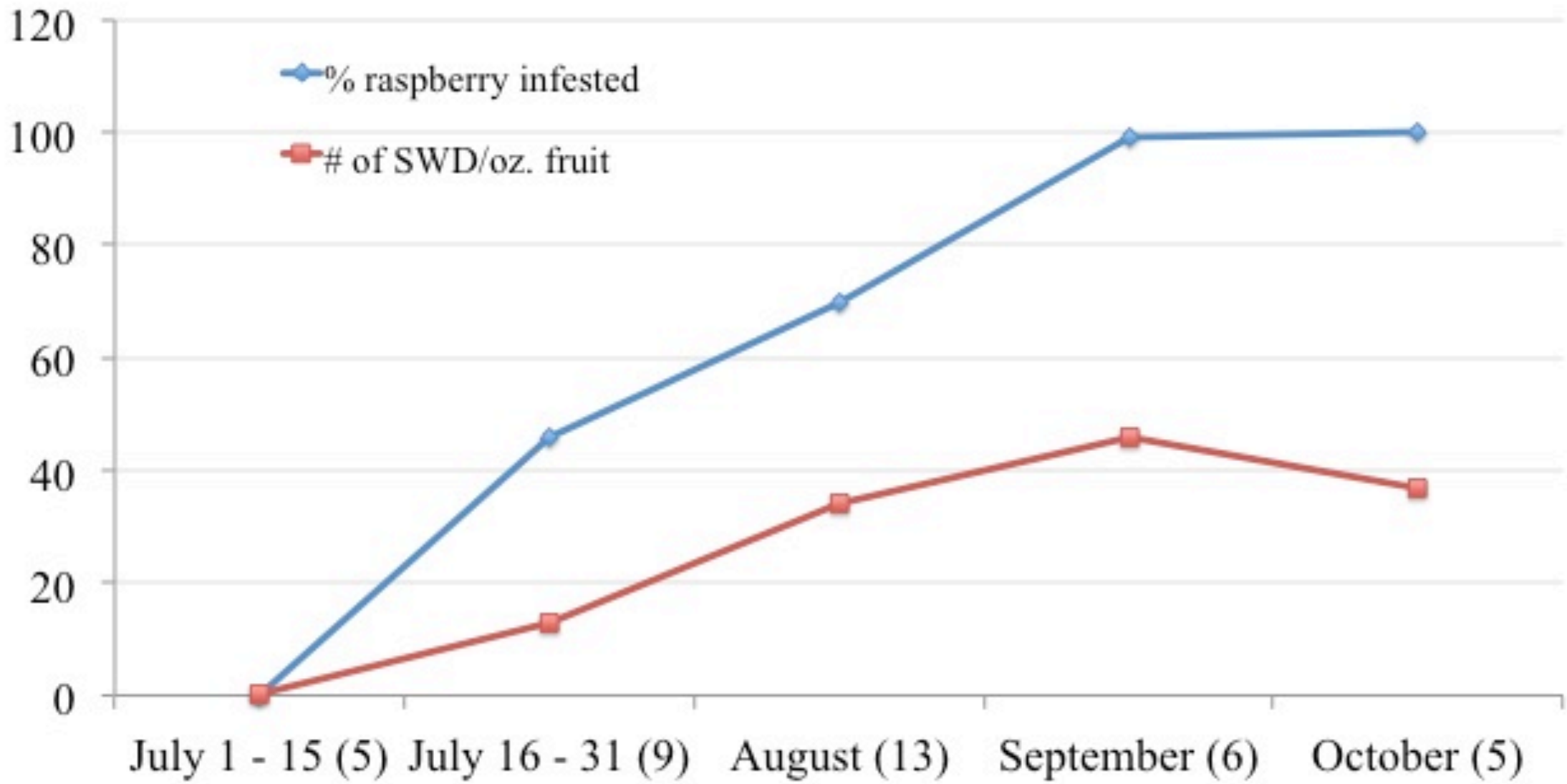
Data from F. Zaman, 2012

Number of SWD emerged from various crops & wild host fruits in lab rearing (14 days)



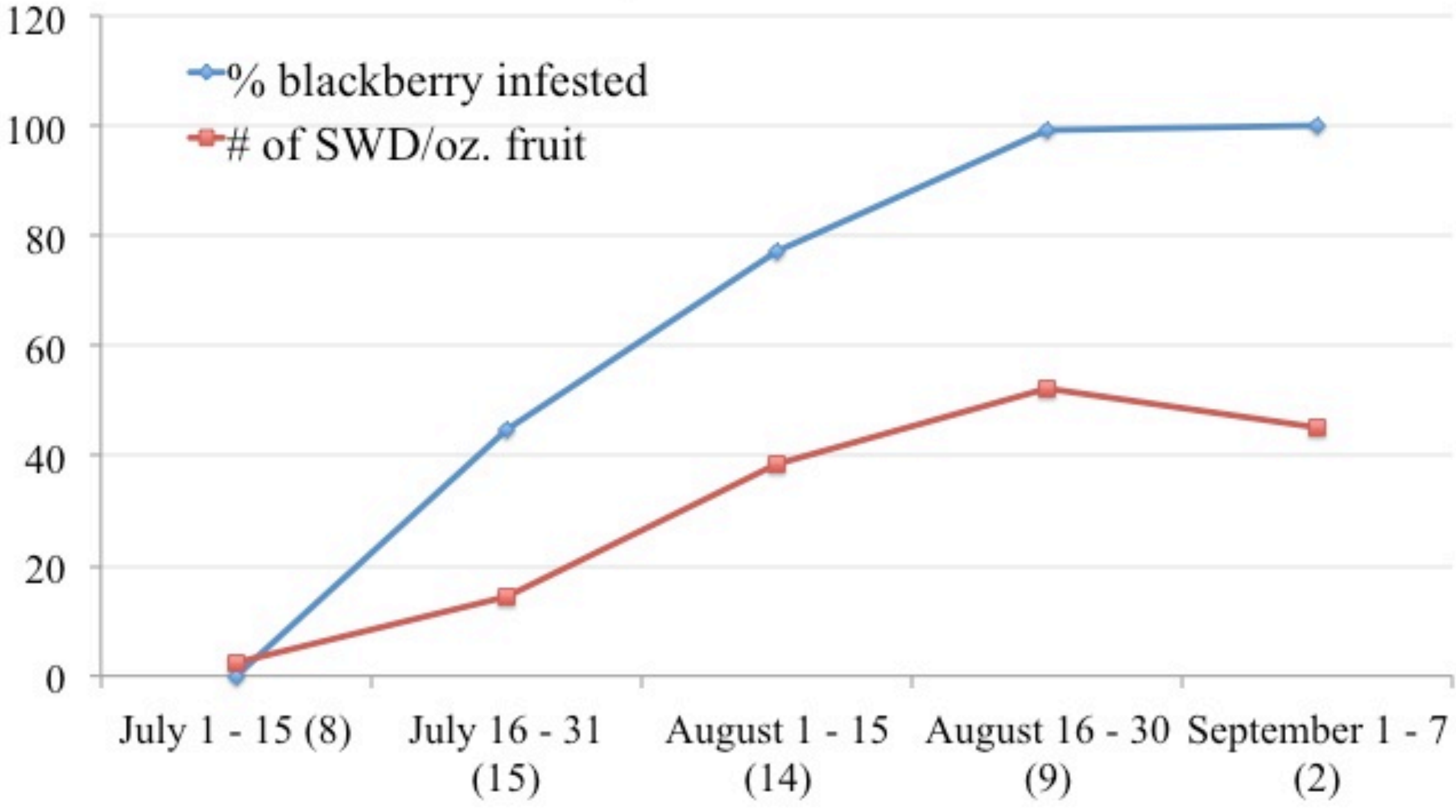
Data from F. Zaman, 2012

Fruit infested by SWD in commercial **raspberry** cultivation and adult emergence after rearing in lab. Long Island - 2013



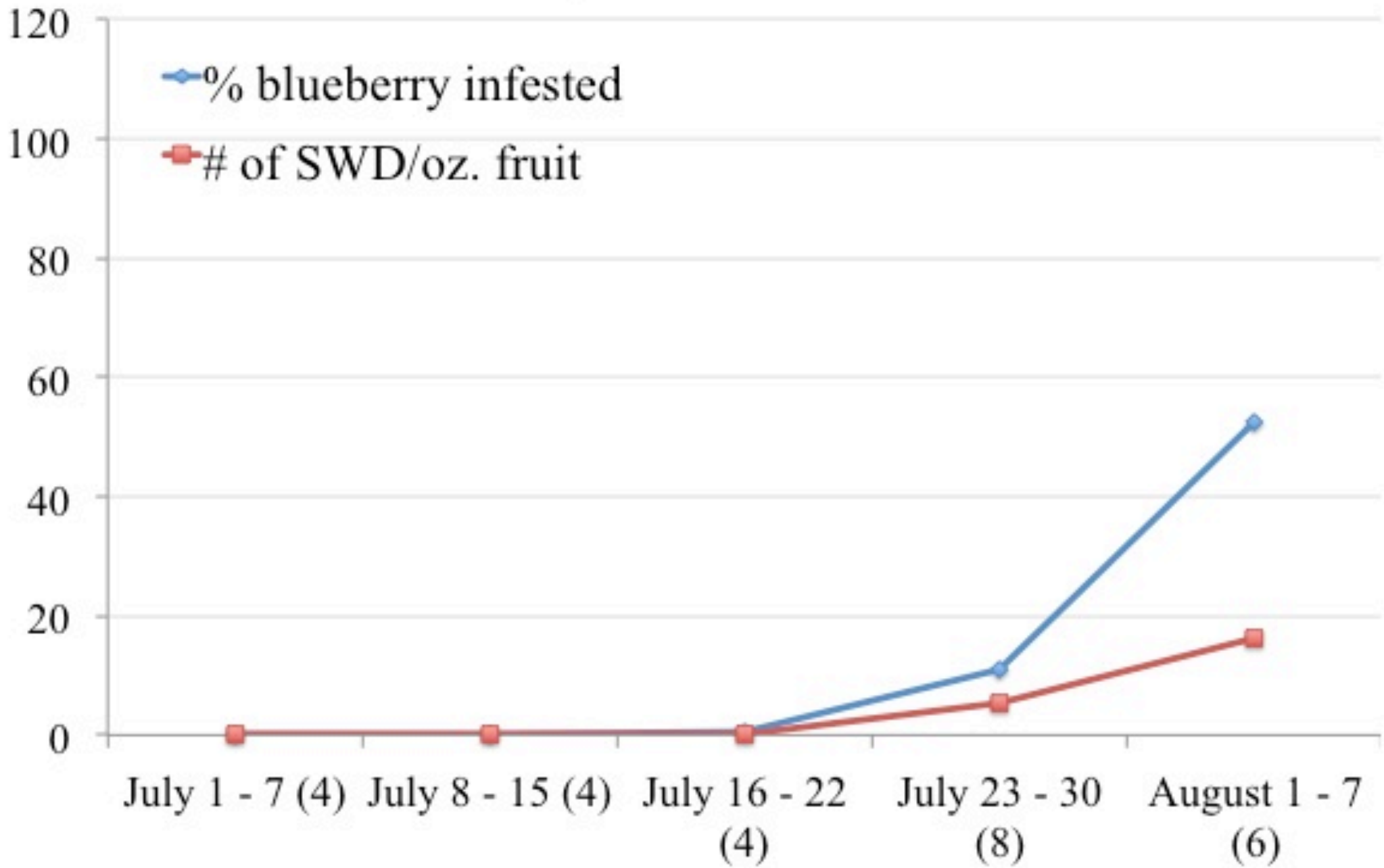
Note: Numbers of 4.0 oz. samples in parentheses

Fruit infested by SWD in commercial blackberry cultivation and adult emergence after rearing in lab. Long Island - 2013



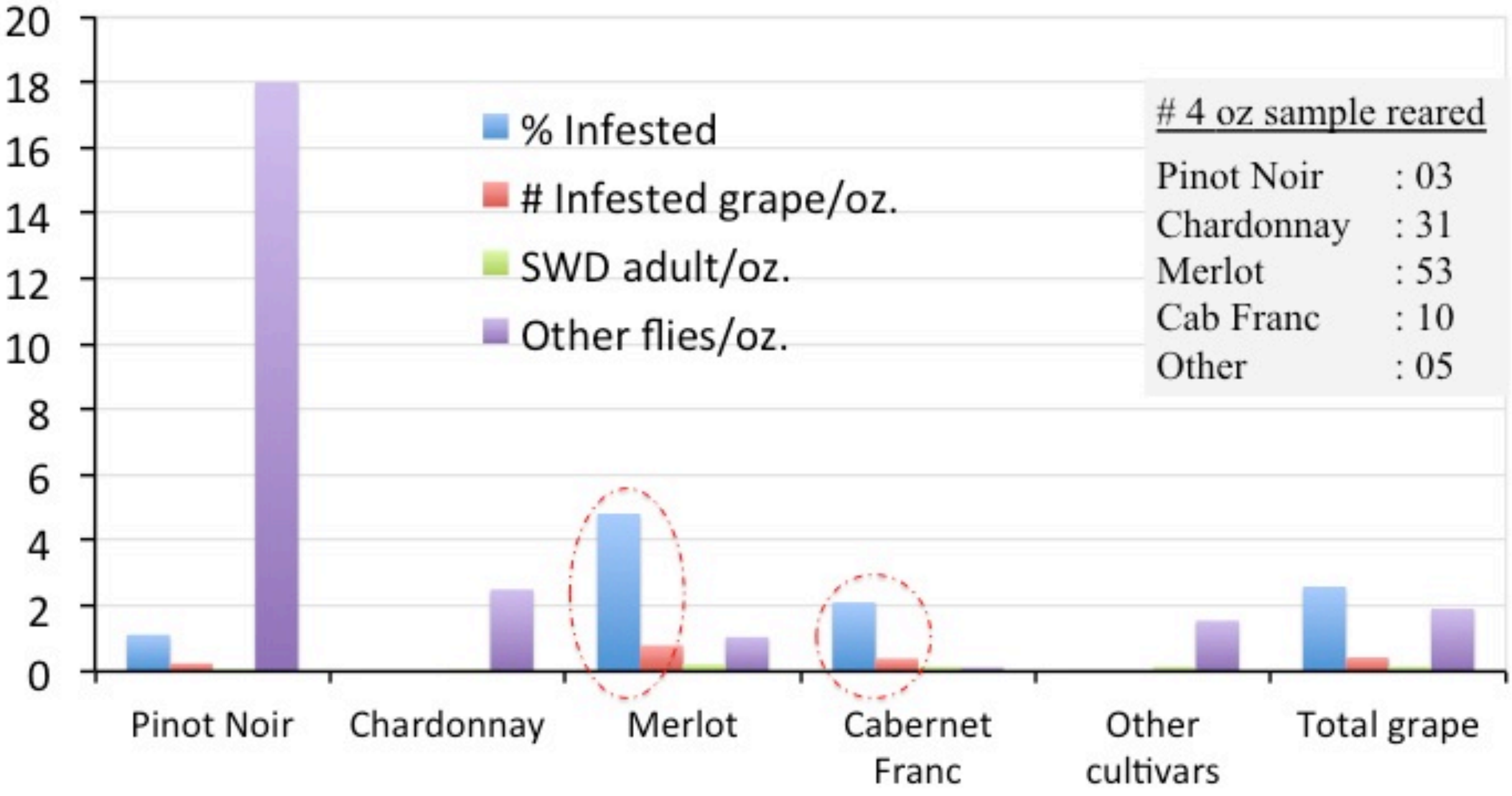
Note: Numbers of 4.0 oz. samples in parentheses

Fruit infested by SWD in commercial **blueberry** cultivation and adult emergence after rearing in lab. Long Island - 2013



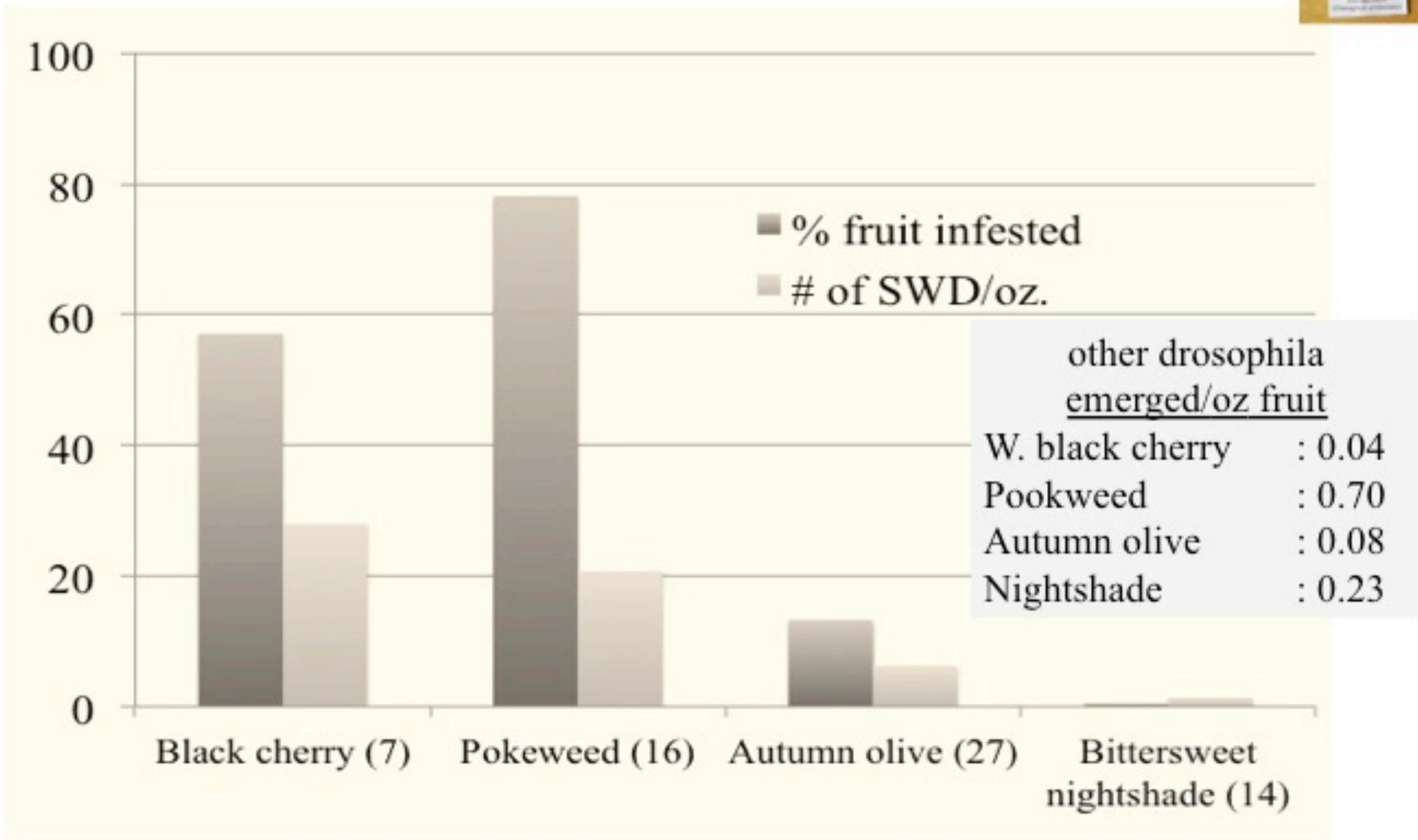
Note: Numbers of 4.0 oz. samples in parentheses

% SWD Infestation and Emergence from Grapes
Long Island - 2013



# 4 oz sample reared	
Pinot Noir	: 03
Chardonnay	: 31
Merlot	: 53
Cab Franc	: 10
Other	: 05

% Wild fruits infested and adult emergence, Long Island - 2013

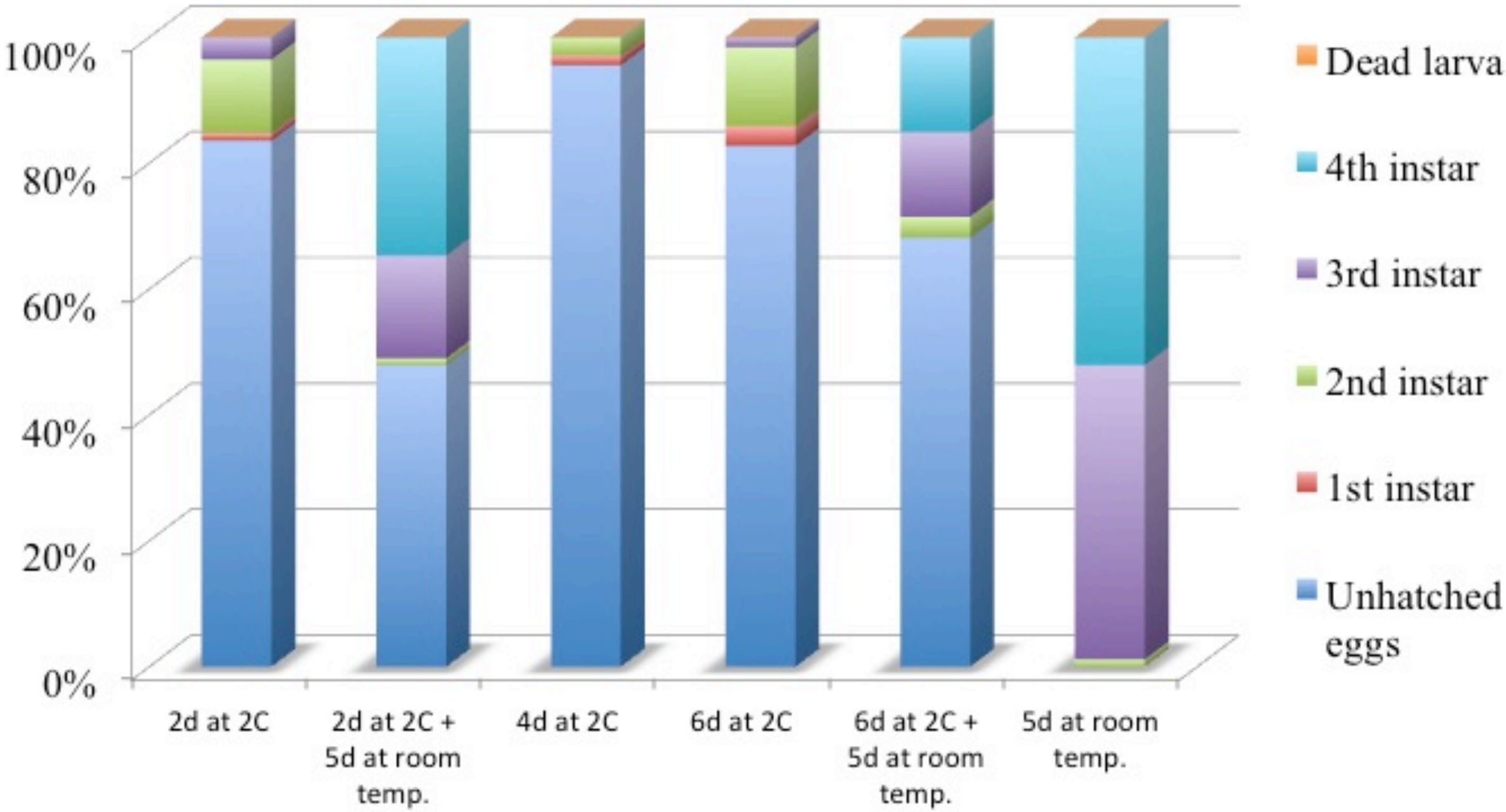


other drosophila emerged/oz fruit

W. black cherry	: 0.04
Pookweed	: 0.70
Autumn olive	: 0.08
Nightshade	: 0.23

Numbers of 4 oz. samples in each crop in parentheses. Period of collection:
BC: 7/31-8/27, PW:8/12 – 11/5, AO:9/5 – 11/5, BN: 7/24 – 10/11

Efficacy of post-harvest cooling to SWD infested raspberries



Data from Faruaue Zaman -2013

Important Findings

Expect SWD to be an annual pest. SWD trap data is a good indicator for early season population and may be used as start-up for control option but may not be used as **linear indicator** for crop damage later in the season. **Direct fruit inspection** is necessary in determining actual crop damage and control strategies.

Consequence of huge population in late fall and early winter, **overwintering and migration** patterns are unknown.

Currently used attractants such as apple cider vinegar and yeast-sugar bait appears to be **weak competitors** particularly at fruit development and ripening period. Superior attractant is necessary. Is attract and kill method an option for organic growers.

Raspberry and blackberry appears to be the most favored crop hosts of SWD on Long Island. Damage could be as high as 100% in the period of major harvest.

Early and mid-season **blueberry** cultivars may escape major fruit damage but late season cultivars (harvest in August to onward) are at risk.

Important Findings

Grape appears to be **not highly preferred** but late season crop particularly red varieties (Merlot, Cabernet) may receive **minor fruit damage** in border rows near forest.

Wild black cherry and **pokeweed berries** are highly preferred mid-summer non-crop host appears to be the major contributing factors for increased SWD population in crops on Long Island. **Autumn olive** seems to be a suitable host for harboring early fall population along with some late fruiting pokeweeds.

SWD work should continue - host preferences, migration, overwintering, detection/ trapping, organic management option, sanitation, pre and post harvest damage control.

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