

Insect Pest Management in Blackberries

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Arkansas Fruit, Vegetable, and Nut Update

Dr. Amanda McWhirt and Dr. Aaron Cato are Extension Horticulture specialists who post timely content for Arkansas producers. Find information on anything from pest management to best practices for growing seasonal crops in Arkansas.



Report on Damage to Fruit Crops from Veterans Day (Nov 11th- 12th, 2019) Cold Snap

By Amanda McWhirt - December 18, 2019

Amanda McWhirt shares her report on the Veteran's Day (Nov. 11th-12th, 2019) cold snap and the potential damage to fruit crops in Arkansas.

tags: **Fruit**

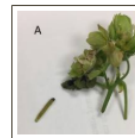


Changes to Paraquat Use Requirements and Labeling

By Aaron Cato - December 18, 2019

Here's what you need to know about label changes for Paraquat and what new restrictions and requirements will be required of applicators.

tags: **Fruit, Vegetables, Pests**



Hops Pest Control in Arkansas - What We Learned in the First Year

By Dr. Jackie Lee and Mike Brown - December 18, 2019

Dr. Jackie Lee and Mike Brown share a summary of their first year tackling pest control in Arkansas grown hops!

tags: **Vegetables, Pests**

Guidebook

2020 Southeast Regional Caneberries Integrated Management Guide

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Recommendations are based on information from the manufacturer's label and performance data from research and extension field tests.

Because environmental conditions and grower application methods vary widely, suggested use does not imply that performance of the pesticide will always conform to the safety and pest control standards indicated by experimental data.

This publication is intended for use only as a guide. Specific rates and applications methods are on the pesticide label, and these are subject to change at any time. Registrations also vary between states and are subject to change at any time, please check with your state department of agriculture or regulatory agency concerning current registration status within your state. Always refer to and read the pesticide label before making any application! The pesticide label supersedes any information contained in this guide, and it is the legal document referenced for application standards.

<https://smallfruits.org/files/2020/01/2020-Caneberry-Spray-Guide.pdf>

IPM Strategy

- Correct nutrient and water management
- Effective weed and disease programs
- Cultural Controls
 - Pruning
 - Prune out damaged canes, remove prunings from plantings and burn
 - Removing nearby wild blackberry
 - Harvesting on time/removing culls
- Chemical
 - Scout!



<https://dissolve.com/video/Field-wild-blackberry-royalty-free-stock-video-footage/001-D1107-78-003>



<https://bugguide.net/node/view/1098517/bgpage>

- Rednecked Cane Borer



- Galls form 18-24 inches up cane



- Raspberry Cane Borer



- Girdles at tips of canes



Redneck Cane Borer Management

- Can be easily maintained through good winter pruning practices.
 - Prune off all galled canes and nearby wild canes at ground and burn to kill RNCB larvae.



Redneck Cane Borer Management

- If >5% of canes are galled **OR** greater than number you planned to prune out:
 - By April 1 – Soil drench of admire
 - or
 - May-June, scout weekly for adult RNCB on primocane leaves in late morning or mid afternoon.
- If adults are observed, spray every 10 days until end of June (*late evening to avoid pollinators*).
 - Spray lower 18 inches of canes
 - Bifenthrin (Brigade 2EC 3.2-6.4oz) is an effective option



<https://bugguide.net/node/view/646851>



Judy Gallagher

Raspberry Crown Borer

- Very significant pest of blackberries in Arkansas
- Can expect increased damage in an area if not controlled
- Very easy to control



Raspberry Crown Borer Biology

- Emerge from pupal cases in early September – October.



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- Larvae hatch then move down the cane and bore in to the cambium just below the soil
 - Overwinter here



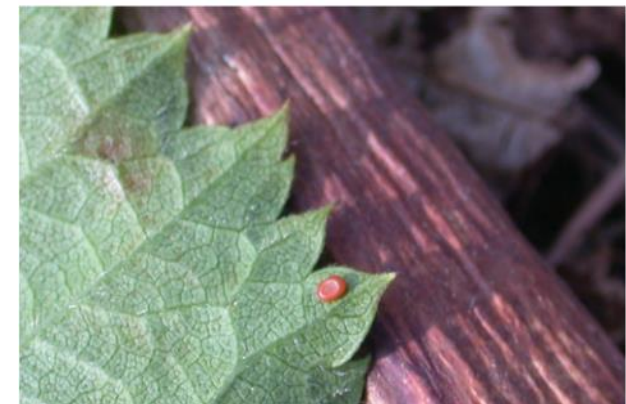
Raspberry Crown Borer Biology

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 - Eggs take almost a month to hatch
- Larvae hatch then move down the cane and bore in to the cambium just below the soil
 - Overwinter here
- Bore in to crown in early spring, complete life cycle



Sampling for RCB

- Inspect base of pruned-off canes or wilted primocanes after harvest
 - Look for tunneling and larvae
- Late September-early October
 - Start looking for pupal skins
- October
 - Scout for eggs on underside of leaves



RCB Management

- Cultural
 - Remove wild brambles from nearby areas
 - Remove heavily infested plants
- Chemical
 - Late October – early November
 - Watch for eggs/pupal cases
 - Brigade or Altacor in 50-100 gal solution to base of canes
 - Soil drench



Raspberry Crown Borer Data

- Data from Dr. Donn Johnson

Treatments	Rate Amt form./Acre	% Reduction in larvae per plant			
		23 Oct. 2003	6 May 2004	3 Nov. 2004	7 April 2005
<i>S. feltiae</i>	220 million IJ	31	17	--	--
<i>H. bacteriophora</i>	220 million IJ	--	--	--	33
<i>S. carpocapse</i>	220 million IJ	--	--	--	53
Guthion	1 lb	89	40	--	--
Brigade	1 lb in 100 gal	99	33	100	--
Brigade	1 lb in 50 gal	--	--	--	86.7
Brigade	1 lb in 100 gal	--	--	--	83.3
Brigade	1 lb in 200 gal	--	--	--	90.0

Stink Bugs



Green stink bug

- Lay eggs on leaves in May
- May-Harvest – Nymphs and adults feed on fruit
 - Fruit tastes like stink bugs
- Feed on blackberries pre bloom through harvest
- Monitor for clusters of stink bug nymphs
- Can use yellow pyramid traps with pheromones
- Time insecticides to manage nymphs



Courtesy of Univ. of Florida

UGA2134079



Courtesy of NC State

Brown stink bug



<https://www.ipmimages.org>

UGA213409

Data Courtesy of Dr. Johnson

Stink Bugs (SB)

Treatment/ formulation	Rate form./acre	% SB Mortality	
		9 July 2 DAT ^a	13 July 6 DAT
Actara 25WG	4 oz	96.7a	100.0a
Spinosad 25C	6 oz	84.2ab	95.0a
Calypso 480SC	4 oz	72.5a-c	92.5a
Avaunt 30WG	4 oz	68.3bc	92.5a
Novaluron 10EC	14 oz	20.8de	55.0c
Untreated check	--	19.2e	50.0c

Means in same column not followed by the same letter are significantly different (Waller-Duncan K-ratio t-test)

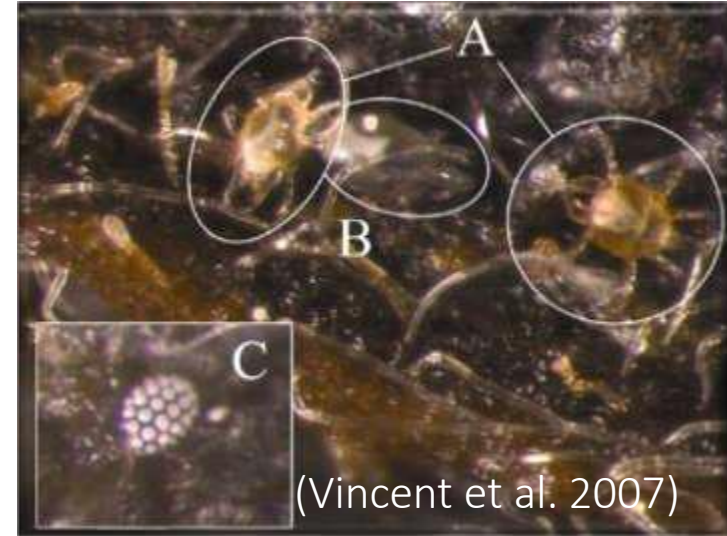
^a DAT = days after treatment

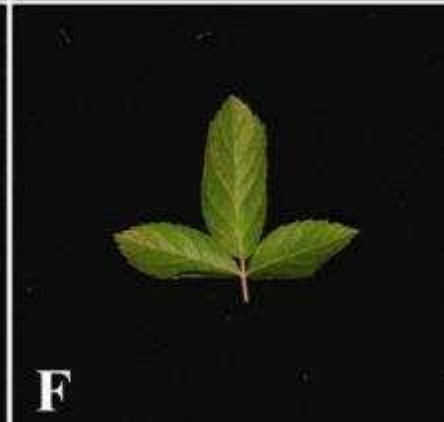
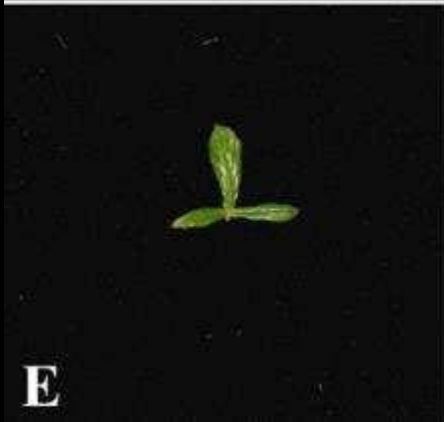
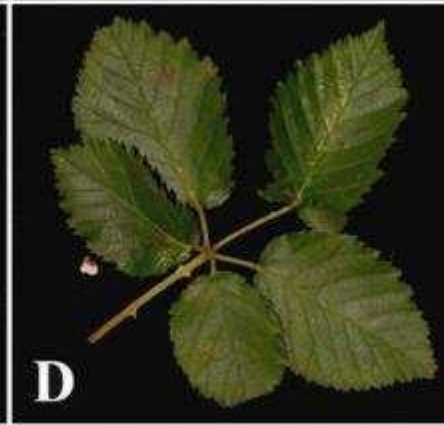
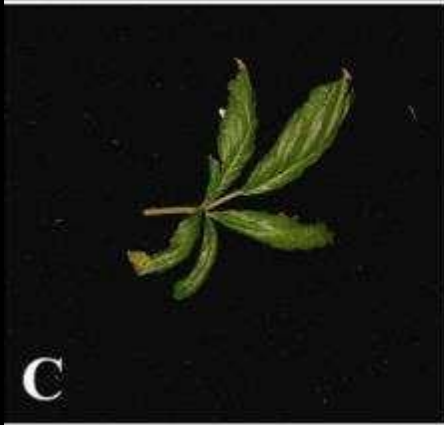
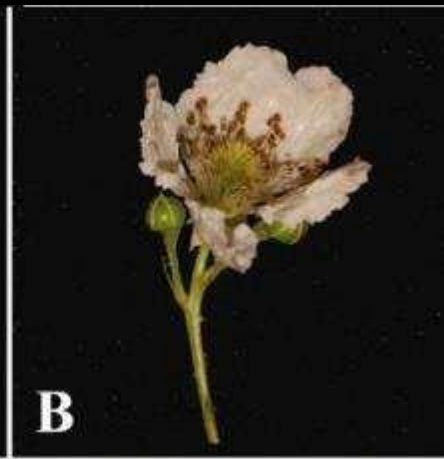
Actara, Brigade, Danitol: Refer to spray guide

- Mustang Maxx – 1 day PHI, also will control SWD
- Check PHI

Broad Mite

- ID
 - Adult has white, dorsal stripe
 - Females are yellow, often seen being carried by males
 - Eggs are covered in white, raised spots
- Potentially overwinters in leaf litter
- Begin damaging blackberry in early summer







Vincent et. al 2010)

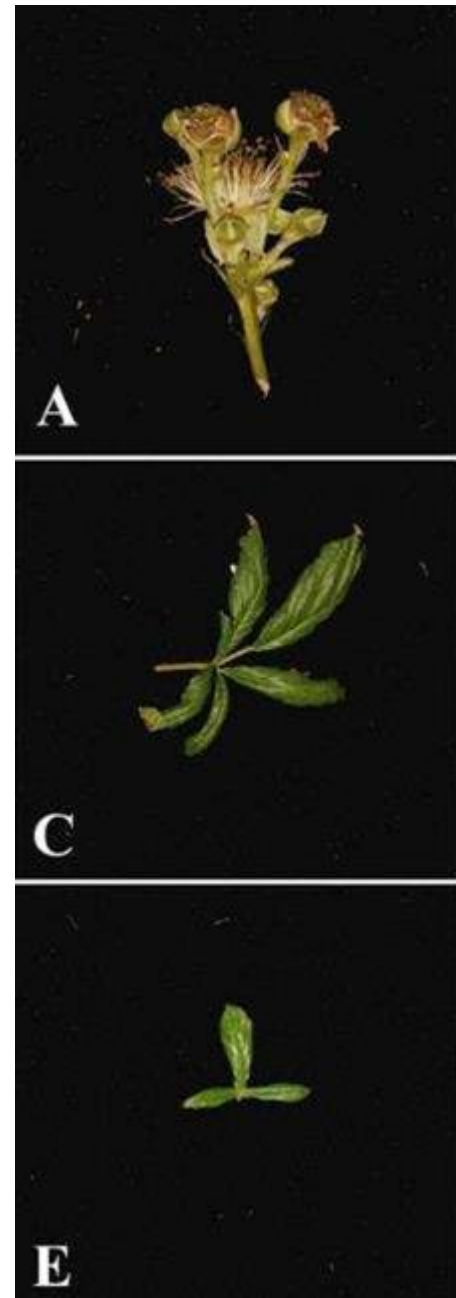


Broad Mite Management

- Can damage all blackberry cultivars
- Begin increasing in density in late-May
- Didn't increase until August this year

- Scout for symptomology
 - Terminal cupping, leaf death (similar to fire blight), and deformed flowers

- Scout for active mites
 - 1-5 mites/terminal leaflet
 - Need ~10x loop



Miticide Efficacy – Dr. Donn Johnson’s Data

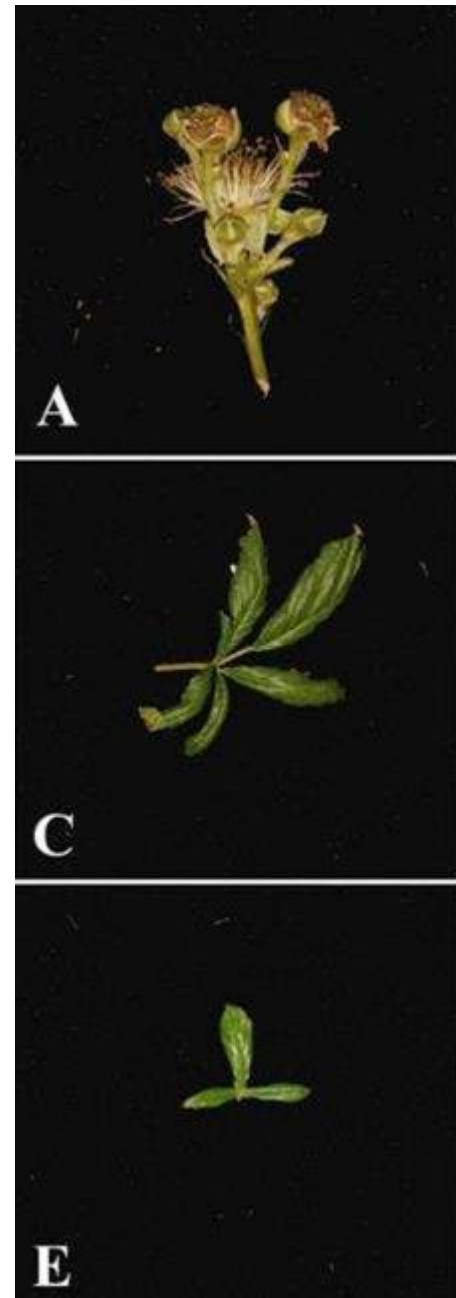
Miticides applied 15-Jul

All Actives/leaflet

Treatment/ Formulation	15-Jul	22-Jul	29-Jul	8-Aug
<u>Agri-Mek</u>	11.5a	0.5d	8.5a	13.5a
<u>Apta</u>	15.4a	1.5cd	11.8a	20.2a
JMS 1% (applied 7/22)	17.8a	18.3ab	12.7a	12.1a
Magister	13.6a	0.9d	6.7a	20.7a
<u>M-Pede</u>	10.7a	15.6b	17.8a	18.5a
Zeal	11.9a	12.2bc	21.1a	20.3a
Check	15.6a	27.0a	26.2a	21.7a
	NS	$P < 0.05$	NS	NS

Broad Mite Management

- Scout for symptomology
 - Terminal cupping, leaf death (similar to fire blight), and deformed flowers
- Scout for active mites
 - 1-5 mites/terminal leaflet
 - Need ~10x loop
- Control
 - Agri-Mek + Surfactant
 - May need 2nd app 10 days later
 - 2 app maximum!



Spotted Wing Drosophila (SWD)

- *Drosophila suzukii*
- Invasive species, first found in Arkansas in 2012
- Different feeding behavior than our native *Drosophila* (fruit flies)



<https://gardenerpath.com/how-to/disease-and-pests/spotted-wing-drosophila-control/>

Spotted Wing Drosophila (SWD)

- Black spot on wing on males
- Serrated ovipositor on females

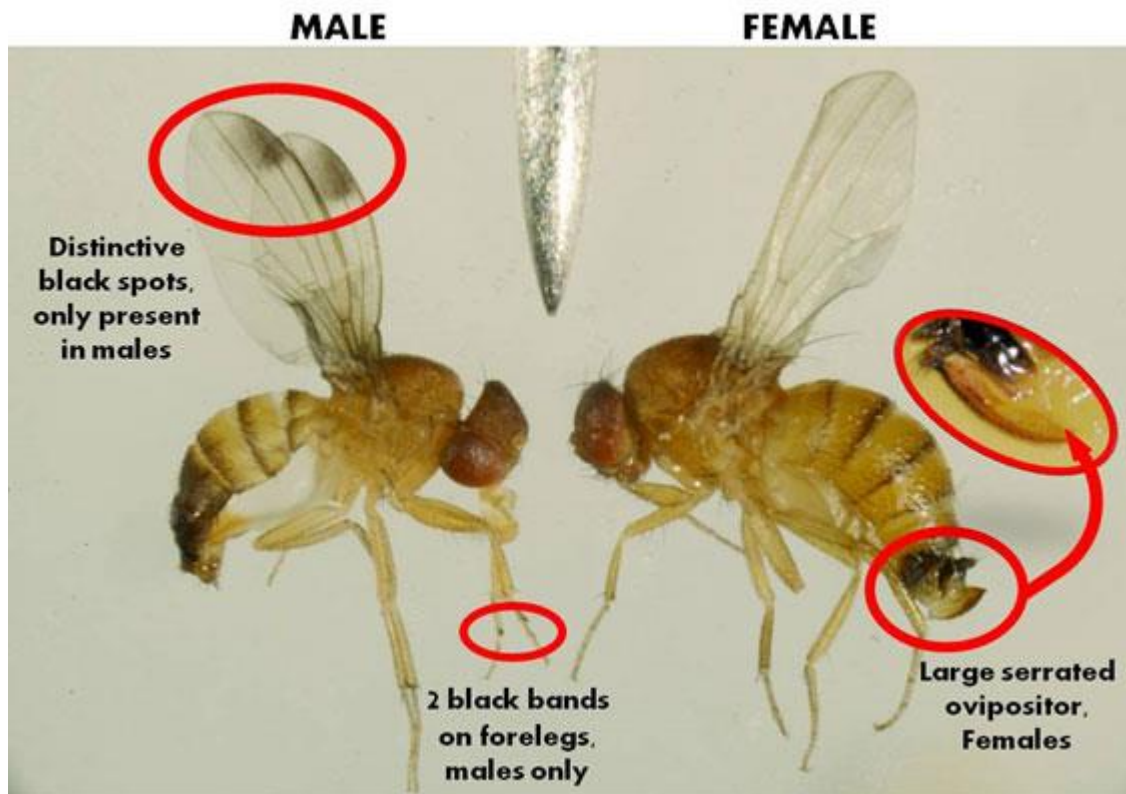
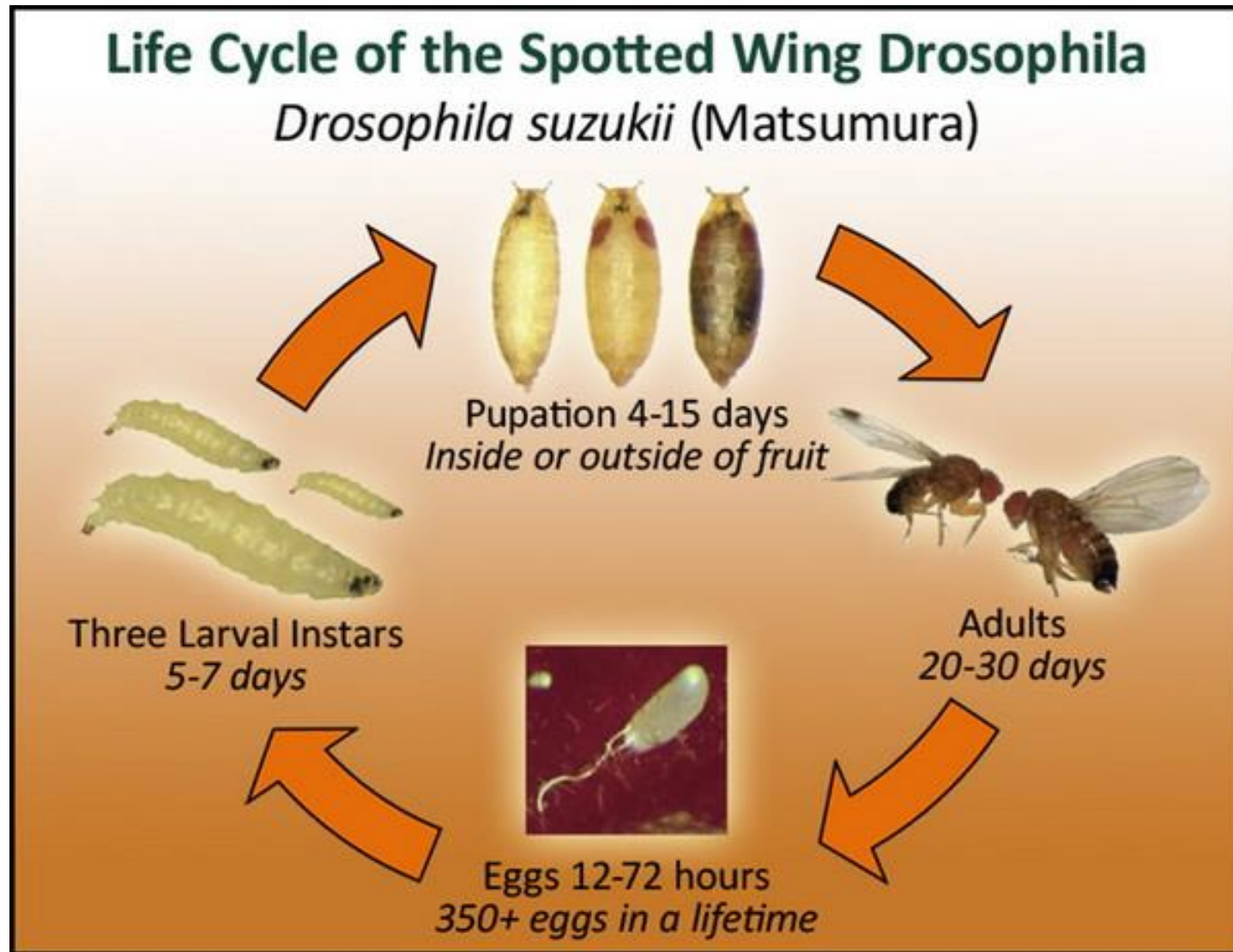


Photo Courtesy of John Obermeyer, Purdue University

SWD Life Cycle



SWD Biology

- Lay eggs in ripe or ripening fruit
 - Skin thickness is key
 - Soften 7-10 days before harvest
- 10-15 day generation time
- Numbers increase throughout spring-summer
 - Blackberries are high risk

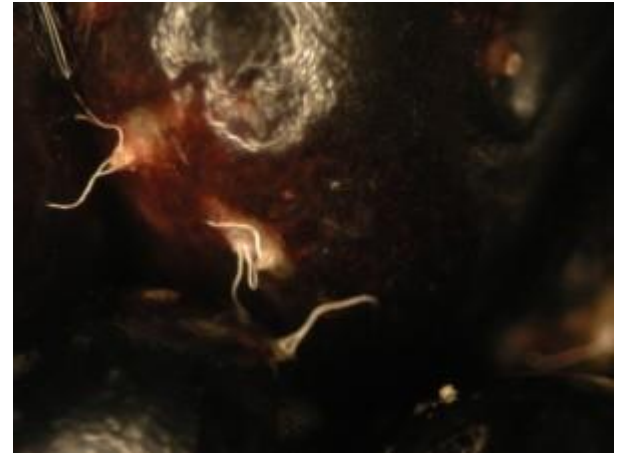


Photo by Peter Jentsch, Cornell



Photo by Rick Bessin, Univ. of Kentucky

SWD Damage

- Make fruit unmarketable
- Feeding causes fruit to soften and become sunken
- Fruit can look fine at harvest, show damage 1-2 days later
- Buyers can reject full loads
 - 0 tolerance



Photo by Univ. of Delaware Extension



Photo by Becky Sideman

SWD Monitoring

- Baited traps
 - 2 TBSP yeast, 4 TBSP sugar
 - 32 oz water
 - ¼ tsp unscented soap
 - Can also do apple cider vinegar
- Begin monitoring around a month before harvest
- Hang ~6 baited traps fruit level in the shade
 - They don't like the heat
- Check traps during the day
 - Active at dusk and dawn
- Don't use trap numbers to make decisions

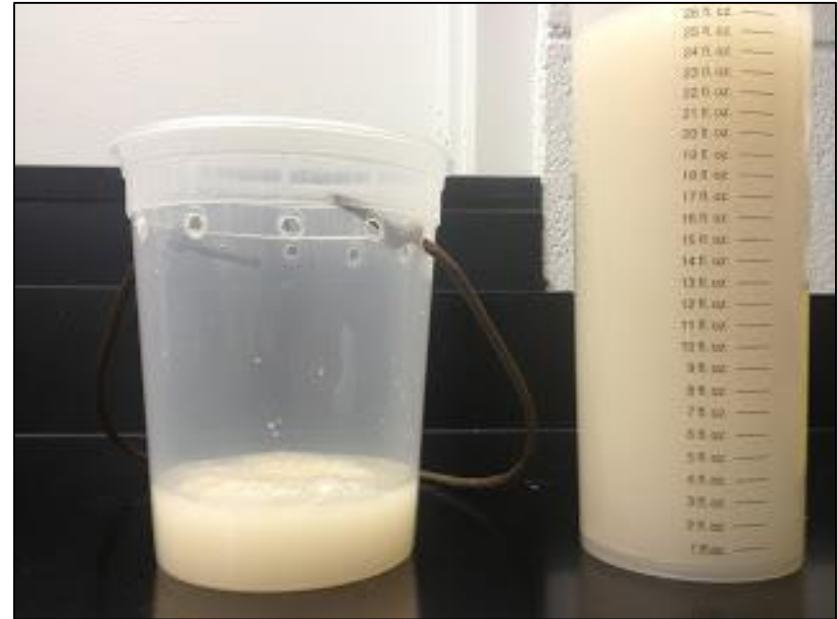


Photo by Hannah Burrack



SWD Monitoring

- Check fruit for larvae to determine effectiveness
 - Also get an idea of what buyer will see
- Salt Water Solution in bag
 - ~50-75 berries
 - 1 cup salt per gallon of water
 - Check in bag or metal pan in 15 minutes



SWD Control

- Harvest fruit as soon as they are ready
 - SWD are attracted to ripe or ripening fruit
- Don't leave culls on the canes
 - Leads to increase pressure in your fields
- Move to cold storage as quickly as possible
 - Slows development, may kill some larvae or eggs
 - 32-36F

SWD Control

- Spraying insecticides on a schedule is currently required for adequate control
 - Every 7 days until harvest is completed
- Begin applications when fruit begins to turn color, or when adults are first caught in traps
- Rotate effective modes of action where possible
- Base insecticide decision on two factors:
 - Pre-harvest Interval
 - Organic vs. conventional

SWD Control options

Trade Name	Active Ingredient	Class (IRAC)	OMRI	PHI
Mustang Maxx	zeta-cypermethrin	Pyrethroid (3A)	no	1 day
Danitol	fenpropathrin	Pyrethroid (3A)	no	3 days
Brigade	bifenthrin	Pyrethroid (3A)	no	3 days
Malathion	malathion	Organophosphate (1B)	no	1 day
Delegate	spinetoram	Spinosyns (5)	no	1 day
Entrust	spinosad	Spinosyns (5)	yes	1 day
Pyganic	pyrethrin	3A	yes	0

- Consult guide for number of maximum allowable applications
- Pyganic offers no residual

New Paraquat Handling and Use Regulations

- Restricted Use Pesticide (RUP)
- Cannot be used around the house
- New Rules (2016)
 - Only certified applicators may come in contact with herbicide products containing paraquat.
 - Individuals mixing, loading, or applying must be certified. Cannot work under the supervision of certified applicator.
 - New closed system for non-bulk paraquat
 - Won't come with a screw cap
 - Manufacturers can sell old system until 9/30/2020
 - Must take new paraquat training
 - www.usparaquattraining.com – **Every 3 years**
 - Only required if the product says so on label.
 - Updated labeling was required by 11/19/2019
 - Product with old label required to be out by end of 2020
- Currently under review by the EPA (15 year review)





Questions?

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