

Spotted Wing Drosophila: A new pest in Ohio's fruit crops

Celeste Welty, Extension Entomologist, Ohio State University, e-mail welty.1@osu.edu, phone 614-292-2803

Introduction

- Looks like common vinegar flies on overripe, fallen, decaying fruit
- But the new species attacks healthy ripening fruit

Detected locations

- In Hawaii since 1980
- California in 2008
- Florida, Washington, Oregon in 2009
- Michigan, Carolinas, Utah in 2010
- Many States in 2011 & 2012
- Ohio:
 - Raspberries, September 2011, VanWert County in Northwest Ohio
 - Aug.-Sept. 2012: Blackberries, raspberries, grapes, in VanWert, Licking, Pickaway, Ross, Franklin, Erie, Huron, Lorain, Ashland, Portage, Greene, Ashtabula Counties
 - 2013 and 2014: many more counties

Hosts

- Early: cherries
- Mid: raspberries, blackberries, blueberries
- Late: grapes
- Also: peaches, plums, strawberries, cherry tomato

Damage

- Egg laying & larval feeding
- Starts as tiny scar on skin of fruit
- Skin collapses in 2-3 days; molds

Life cycle

- Larvae feed inside fruit for 5-7 days
- Pupa inside or outside fruit
- 350 eggs per female fly
- One generation in 8-16 days
- Many generations per year
- Overwinters as adult in protected places

Identification

- Adult male:
 - Spots on wings (visible with naked eye)
 - Two dark bands on front leg (need magnifier)
- Adult female:
 - Saw-like, hard ovipositor (need magnifier)

Current Status

- Please alert us if this pest is found or suspected
 - Via your local extension educator
 - Or me (C. Welty) directly

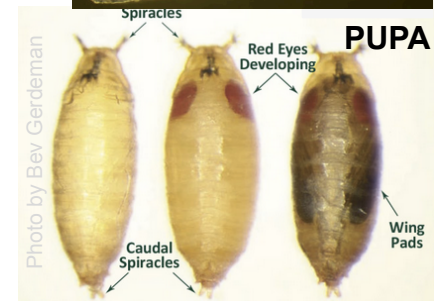
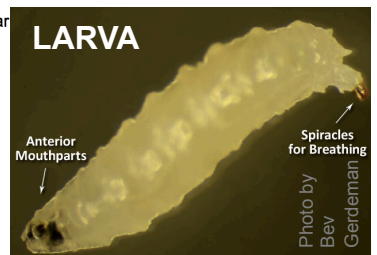
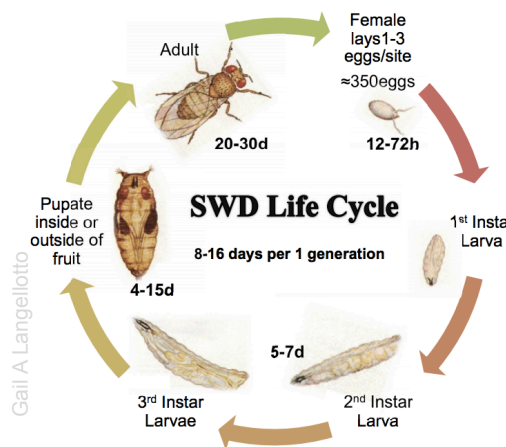
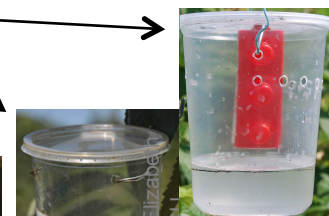


Figure 5. An enlarged view of the SWD ovipositor showing serrated edge (a); an example of a common vinegar fly ovipositor which does not have a sclerotized ovipositor (b).



Monitoring adult SWD flies with bait traps

- Option #1: commercial trap & lure made by Scentry Biologicals Inc.
 - hang lure from lid of trap
 - make drowning solution: 25% apple cider vinegar, 75% water
 - put solution in trap, 1 inch depth, add drop of detergent (to prevent floating)
 - change lure every 4 weeks
- Option #2: make-your-own traps
 - clear plastic container (1 quart) with lid
 - drill ¼" holes across top, along one side
 - bait option #1: commercial lure from Scentry Inc. or Trécé Inc.
 - bait option #2: apple cider vinegar, full strength, 1 inch deep + drop soap
 - bait option #3: yeast + sugar + flour + water in small cup with net lid, float on vinegar
- Use strainer and fine brush to remove trapped insects once per week
- Threshold: capture of a single confirmed SWD adult
- Beware, many non-target insects likely to be caught



Monitoring fruit for SWD larvae using salt tests

- In zip-top bag: 2 tablespoons salt + 2 cups warm water + fruit
- After 20 minutes, look for larvae floating to top

Management

- Do not delay harvesting; pick as soon as fruit first ripen
- Keep harvested fruit cooled as soon as picked
- Sanitation is critical: collect & destroy damaged fruit every 2 days; put culls in clear plastic bag in sun for 1 week
- Fine netting is a mechanical control option, especially for organic growers
- If any SWD found in trap, then fruit need protection by insecticide sprays, starting when fruit begin to ripen (berries start to turn color), until final harvest
- Spray every 7 days with insecticides that provide 7 days residual activity
- Do a salt test weekly to see if control program working well; if control not good, try sprays every 5 days
- Insecticides for home gardens: see separate document; spinosad is one good choice for most crops.
- Insecticide options (based primarily on trials in OR, WA, CA, MI, NJ, NC, FL in 2011 and 2012) in table below
- For resistance management, rotate among different mode-of-action groups: spinosyns (yellow in chart), diamides (light gray), pyrethroids (pink), organophosphates (blue), carbamates (green), and neonicotinoids (dark gray)
- Adjuvants that can increase efficacy slightly are NuFilm-P or sugar or sugar plus yeast

Efficacy	Mode of action group	Product	Residual activity (days)	Pre-harvest interval (PHI)						
				raspberry, blackberry	blueberry	strawberry	grape	cherry	peach	plum
Very effective	5	§ Delegate	5-7	1 day	3 days	X	7 days	7 days	14 days	7 days
	5	§ Radiant	5-7	X	X	1 day	X	X	X	X
	28	Exirel	5	X	3 days	X	X	3 days	3 days	3 days
	3A	! Mustang Max	7-10	1 day	1 day	X	1 day	14 days	14 days	14 days
	3A	! Brigade	7-10	3 days	1 day	0 days	30 days	X	X	X
	3A	! Hero	7-10	3 days	1 day	X	30 days	X	X	X
	3A	! Danitol	7-10	3 days	3 days	2 days	21 days	3 days	3 days	3 days
	3A	! Asana	7-10	7 days	14 days	X	X	14 days	14 days	14 days
	3A	! Baythroid	7-10	X	X	X	3 days	7 days	7 days	7 days
	3A	! Warrior	7-10	X	X	X	X	14 days	14 days	14 days
	3A	! Pounce	7-10	X	X	X	X	3 days	14 days	X
	1B	Imidan	7	X	3 days	X	14 days	7 days	14 days	7 days
	1B	! Diazinon	7	7 days	7 days	5 days	X	21 days	21 days	21 days
	1A	! Lannate	3-6	X	3 days	X	X	X	4 days	X
Effective	1B	Malathion	5-7	1 day	1 day	3 days	3 days	3 days	7 days	X
	5	Entrust [OMRI]	3-5	1 day	3 days	1 day	7 days	14 days	14 days	7 days
Moderately effective	1A	Sevin	10	7 days	7 days	7 days	7 days	3 days	3 days	3 days
	4A	§ Assail	1-3	1 day	1 day	1 day	3 days	7 days	7 days	7 days
	-	Grandevo [OMRI]	1-3?	0 days	0 days	0 days	0 days	0 days	0 days	0 days
	-	Venerate [OMRI]	1-3?	0 days	0 days	0 days	0 days	0 days	0 days	0 days
Slightly eff.	3A	Pyganic [OMRI]	1-3	0 days	0 days	0 days	0 days	0 days	0 days	0 days
Not effective	4A	Actara	1-3	3 days	3 days	X	5 days	14 days	14 days	14 days
	4A	Admire Pro	1-3	3 days	3 days	7 days	0 days	7 days	0 days	7 days

! Restricted-Use Pesticide.

§ Not allowed in greenhouses or high tunnels.

X means that the product is NOT ALLOWED for use on that crop.

OMRI means allowed for use in organic production.