



What organic insecticides are available & effective?















# Assessing the impacts of spotted wing drosophila

Impact assessments for the eastern US indicated that the damage *potential* for SWD is \$207 million annually

Damage *potential* for the western US estimated at \$511 million annually

What are the actual impacts of SWD?

We need your help!

http://swd.ces.ncsu.edu/2014/01/swd-impacts-2013/

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	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
	Apple cider	Yeast &	Fermenting	Droskidrink	Synthetic	Synthetic
	vinegar +	sugar	bait in ACV		lures over	lures over
	soap 150 ml of ACV.	solution	69 g whole wheat flour, 8	150 ml of a solution of 450 ml ACV,	ACV 150 ml of ACV.	drowning solution
	4 ml soap/gal	fl oz water, 0.76 ml	g sugar, 1.3 g yeast, 4 ml ACV, 100 ml	150 ml red wine, 12 g muscavado	4 ml soap/gal	150 ml of a solution of 600 ml water,
		unscented soap	water (4 fl oz per trap) floating in	sugar		6 g borax, and 0.24 ml soap
			solution of			
			600 ml, 67 ml 95% ethanol,			
			3.3 ml soap			
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#### **Bait/lure conclusions**

<u>Fermenting baits and synthetic lures over ACV were similar in total</u> <u>trap captures</u> Fermenting bait lures may suggest other possible volatile attractants

<u>Differences in attraction between sexes may impact bait efficiency</u> <u>between crops</u> Synthetic lures had higher trap captures in blueberries and generally had lower trap captures than caneberries

Baits or lures which captured large numbers of SWD may also capture larger numbers of non target insects

All baits captured flies 1 to 2 weeks earlier than ACV

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#### Determining when flies are present Adult monitoring summary

No trap & bait combination has been demonstrated to consistantly capture flies before infestation occurs or has been tested for tracking treatment efficacy But some new baits/lures are promising

Trap captures indicate presence or absence

When SWD is active, preventative treatments should be applied if susceptible fruit is present

What are other ways growers can monitor SWD?

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### Monitoring tools - Fruit sampling

Fruit samples should be collected from each field/variety block at each harvest

A "salt test" is a quick way to assess larval presence % cup salt dissolved 1 gal water Poured over a thin layer of fruit Larvae should be visible within 15 minutes

Salt tests may miss small larvae Drosophila larvae cannot be distinguished by species – do not sample rotting fruit!











When should SWD management begin? How can you determine if flies are present? When does infestation start?

What non chemical tactics are available?

What organic insecticides are available & effective?



























### Spotted wing drosophila Topics

When should SWD management begin? How can you determine if flies are present? When does infestation start? What non chemical tactics are available?

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#### Non chemical tactics Post harvest storage temperature

Methods for cold temperature experiments Artificial diet

Used to determine what temperature and duration most negatively impacted immature SWD

#### Fruit

Fruit infested over the course of 7 days and held at 68F until desired life stage reached At least 24 treatment replicated and 8 control replicates were conducted for each life stage

Exposed in commercial scale cold room at 35F for 72 hrs















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#### Effective organic chemical controls are very limited

Most effective = Entrust. A spinosyn insecticide



But, limited amounts allowed per acre per season

For resistance concerns, label requires rotation to a different chemical class after 2 sprays.















## New Entrust formulation, seasonal limits Example from blueberry and caneberry labels

Entrust 80WP 1.25-2 oz per acre 9 oz seasonal maximum Entrust 2SC 4-6 oz per acre

6 applications maximum 3 day pre-harvest interval 4 hour re-entry interval 6 applications maximum 3 day pre-harvest interval 4 hour re-entry interval

29 oz seasonal maximum

Check 24c labels for different crops and states at www.cdms.net

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#### Ongoing exploration for organic insecticides

- Fly-active strains of B.t. (Cowles)
- Fungus (metarhizium) formulations tested
- Botanical insecticides
- Low levels of activity, but may contribute to population reduction









Input cost/loss (7 applications, 7, 800 acres)	Cost/acre/applicati on	Seasonal value/acre	Industry-wide input		
Sprayer	\$37	\$259	\$2,020,200		
Chemicals	\$50	\$350	\$2,730,000		
Fruit drop/appl.	\$38	\$266	\$2,074,800		
Unharvested fruit (2%)	-	\$150	\$1,170,000		
Total	\$169	\$1,025	\$7,995,000 (6.6% of total value)		

#### Current Drosophila suzukii management challenges

- Application difficulties
  - PHI and REI's
  - Aerial sprays costly
  - Fruit knockdown
- Increased production costs
- Disruption of IPM





#### Efficacy of **border sprays** in Liberty blueberries

#### Border sprays



Cover sprays

- Border (B) vs cover (C) spray at 24ha (60 A) for 2 years
- B-sprays had 15 m (50 ft) swath into field and untreated center
- C-sprayed 2 of 3 B-plots after high adult, larvae in 2013











































































