



Unusual Chemistries to Consider for Controlling SWD

Richard S. Cowles

Connecticut Agricultural Experiment Station
Valley Laboratory, Windsor, CT

The problem:

SWD infest soft fruit just before they are ready to pick

PHI: Days-to-harvest

REI: Re-entry interval

MRL: maximum residue limit

IRAC: classes active against SWD are not IPM friendly

OMRI: organic materials review institute

Plus, some crops (day-neutral strawberries, raspberries) have open flowers at the same time as ripe fruit

Possible solution (#1)

Extreme selectivity: find Bt active against SWD adults

Results:

Screened ~150 dipteran-active Bts, USDA collection

Zero hits

Possible solution (#2)

SWD are extremely sensitive to desiccation
Surround WP may be objectionable

Silica aerogel dust

Lower mammalian toxicity

Could dry application be approved?

Already exempt from tolerance

Down sides: reapply after every rain event
probably non-selective in effects on arthropods

Possible solution (#3)

Forget insecticides! Use mass trapping

Use of attractants to directly manage insects requires a U.S. EPA registration

Biolberica is pursuing registration of Suzukii
Trap bait

Mass trapping is inefficient by itself

Only 10 – 30% of SWD visiting a trap enter to drown

Integration (Possible Solution #4)

- #1, Use traps for resistance management and adjunct to conventional spray program
- #2, Use sprays only when exceeding trap threshold
- #3, Use insecticides on the outside of trap and/or surroundings (Attract-and-kill program)

MRL, PHI, REI
problems may
vanish!

Ideal A&K program

Use insecticide on outside of trap only
no residue on surrounding fruit!
minimal amount of a.i. required
could achieve high selectivity

Application with phagostimulant can broaden effective
modes of action

avoid IRAC classes used in foliar sprays, OR,
use potent, synergistic mixtures and high dosage
for resistance management

Boric acid

Will not photodegrade

Blockage of multiple enzymes by complexing NAD

Low mammalian toxicity (<NaCl)

Already exempt from tolerance

Inexpensive

Field results

Promising, but selectively toxic to SWD males

Xanthene dyes

Require exposure to light, O_2 , to generate free radicals

Almost deployed to control Medfly, replaced by spinosad

Can this be practical against a fly that seeks out shade?

Insect growth regulators

Dimilin (diflubenzuron)

Esteem (pyriproxifen)

How can we determine efficacy? Adults are not killed.

Summary

Effective management of SWD begs for a new pesticide use paradigm with an A&K program

Minimal quantity of pesticides needed does not fit pesticide manufacturers' economic model, they need to recover registration costs

Can IR-4 help to resolve paradox? Some products do not need residue data for registration.