



Biological Control of Spotted Wing Drosophila

A Research Project of the Beneficial Insects Lab (BIL)
North Carolina Department of Agriculture & Consumer Services



- *Drosophila suzukii* (SWD) is an invasive species native to Asia and a pest of many valuable berry crops, such as blueberries, caneberries, strawberries, & cherries
- Unlike native *Drosophila* species, which lay their eggs in overripe and rotting fruit, SWD infest healthy fruit using a large, serrated ovipositor with two rows of teeth



Photo courtesy of University of Georgia
CAES Newswire

Spotted Wing Drosophila (SWD) Life Cycle

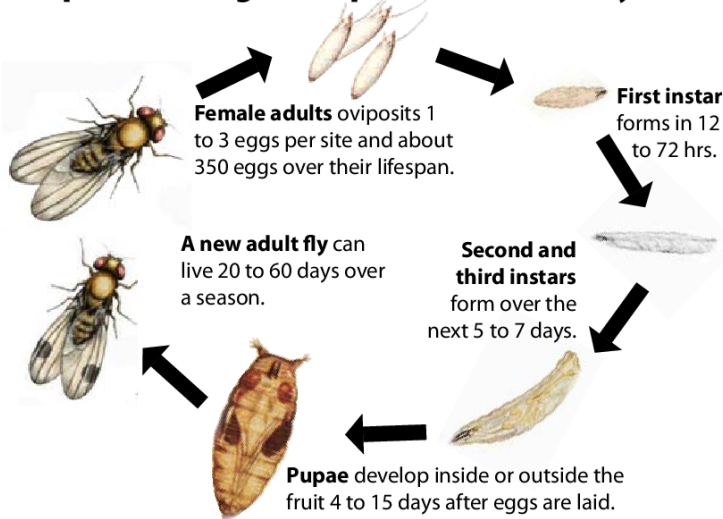


Illustration courtesy of Oregon State University

Challenges

- SWD is not picky. It is a pest of all soft fruits
- Pesticide sprays only target adults (eggs and larvae are already inside the fruit)
- Depending on temperature, SWD can complete all 4 life stages in under 14 days and adult females can lay over 300 eggs in a lifetime

Control Strategy

- Biological Control as part of an integrated management plan
- Host-specific, stringently vetted natural enemy: A parasitoid wasp
- *Ganaspis kimorum* (Gk) parasitizes SWD larvae by depositing eggs into the larvae as they are feeding inside the fruit



Photo by Kent Daane

The Plan

- Rear and release Gk at research stations growing berries in NC
- Determine whether Gk can establish a self-sustaining population and provide some measure of control
- Collaborate with researchers across the US and Canada to share results and strategies

Rearing Gk

- Maintain an SWD colony
- Allow flies to infest blueberries
- Add Gk breeders to infested berries
 - New wasps emerge within 30 days



Gk set up with infested blueberries for development inside a controlled environmental chamber



Over 70,000 *G. kimorum* released in three ecoregions of NC

1. SWD on blackberry (image by Abby Vickery)
2. Vial of Gk prior to release on blueberries (image by Greg Wiggins)
3. Gk just after release on blackberries (image by Charles Dial)

Post-Release Monitoring

- Deploy Sentinel traps monthly
 - Traps baited with infested fruit to attract Gk & assess presence
- Use liquid traps to continue monitoring SWD infestation
- Sample field fruit monthly
 - Includes cultivated and any wild berries in the vicinity
 - Incubate berries and test for presence of Gk



Sentinel traps with infested fruit

Future Directions

- Ongoing field studies incorporating new release sites and methods
- Improvements in rearing protocols to increase wasp production