

Peach Twig Borer Biology and Management in Utah



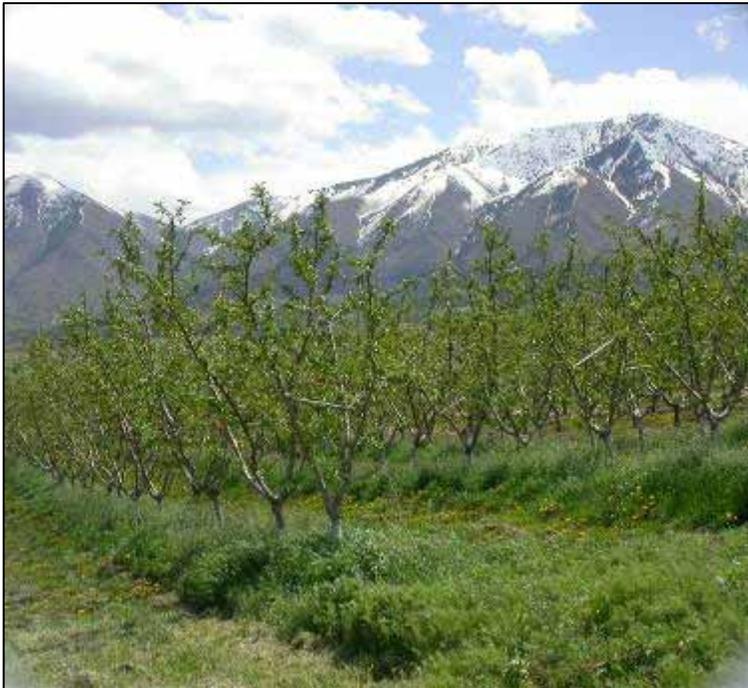
Shawn Steffan
Dept. of Biology
Utah State University
Logan, UT



Utah State
UNIVERSITY
EXTENSION
*extending
usu to
you*

Peach Twig Borer Biology

- Overwinters as a larva (caterpillar).
- Overwintering sites are small “galleries” created within the tree cambium.
- In spring, as leaf and flower buds open, the PTB larvae emerge to feed on young leaves and flower petals.



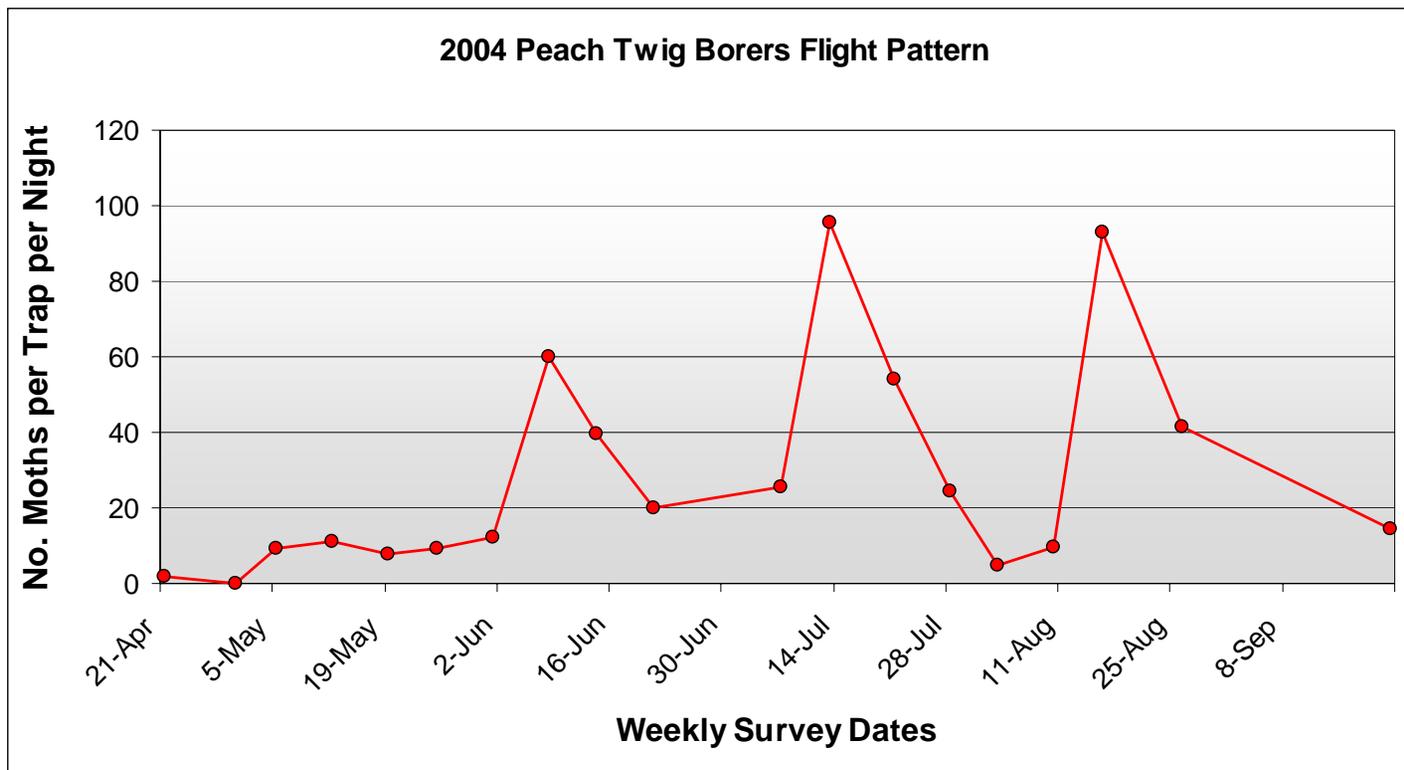
Peach Twig Borer Biology



- Having fed and completed their development, larvae (now measuring up to ½-inch) look for protected sites to pupate.
- The adult moths emerge to mate and lay eggs (in Washington Co., the flight should begin mid-April to early May).

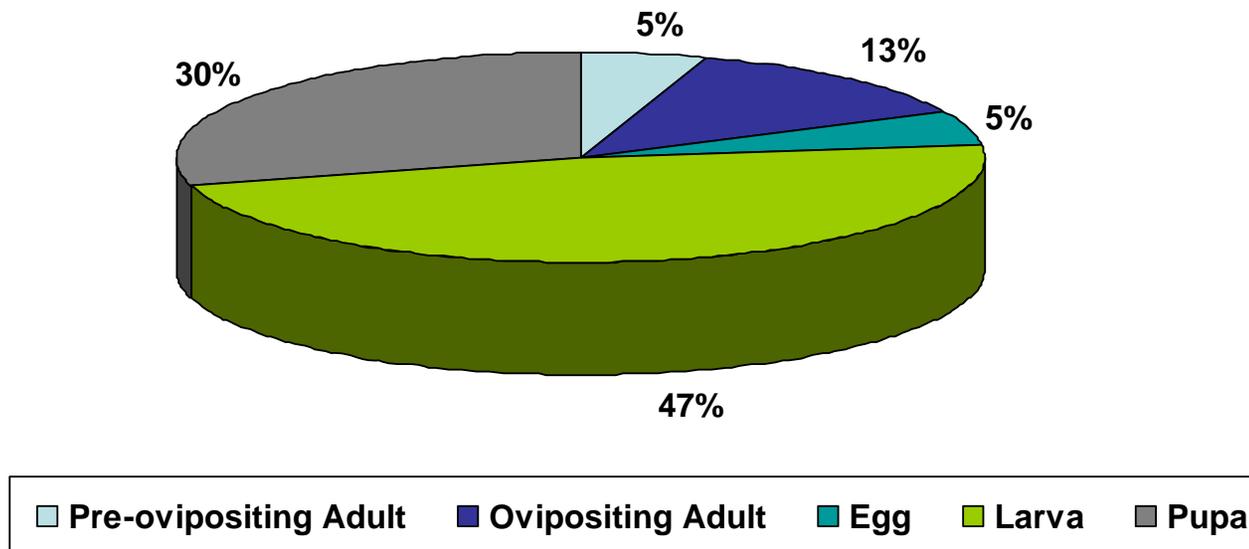
Peach Twig Borer Flights

- In Washington County, there are usually 5 generations per year.
- In northern Utah, there are usually 3 generations per year.

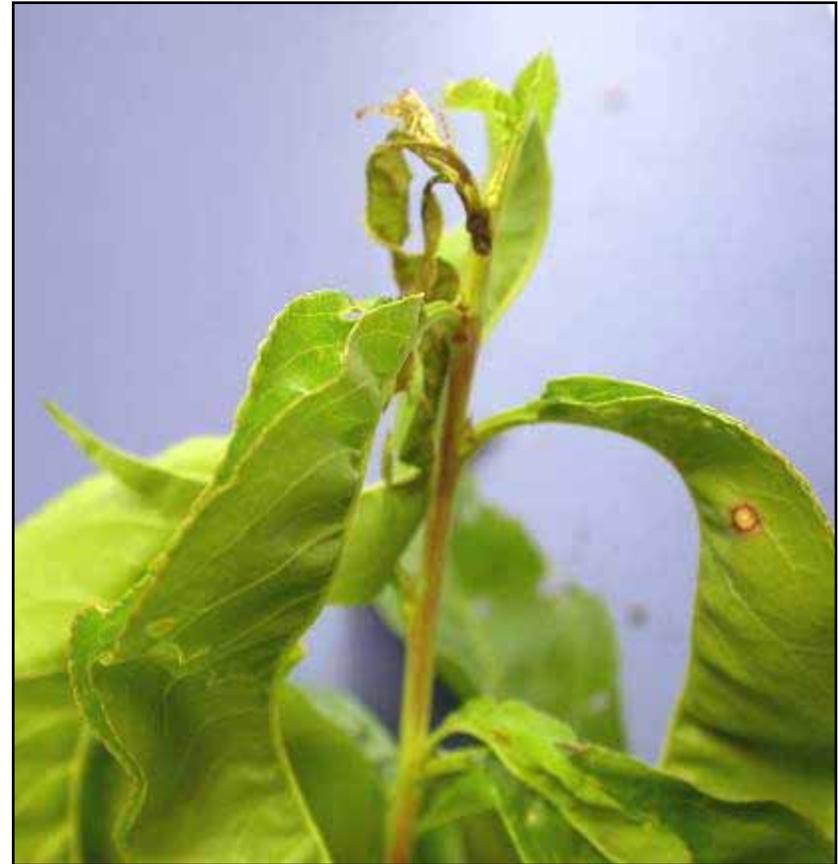


Degree-Days (DDs) for Each Stage

- Total required for a generation: **1,092.6 DDs**
 - Pre-ovipositing Adult: **50.4**
 - Ovipositing Adult: **124.2**
 - Egg: **165.6**
 - Larva: **464.4**
 - Pupa: **288.0**



PTB Shoot Strikes



Peach twig borer larvae generally require **3 to 5 shoots** to complete their development

Typical Fruit Damage



PTB Feeding Patterns

- In the **early to mid-season**, twig borer is more interested in *new shoots* than fruit.
- By mid- to late-season, most shoots form a terminal bud, and the tree puts its resources into fruit production.
- Fewer succulent shoots and ripening fruit => fruit is increasingly targeted by hungry larvae.



Scouting for PTB

- Management begins with *monitoring*.
- Adult moths are easily monitored using **pheromone-baited traps**.
- **Shoot strike counts** measure population density, as well as provide spray efficacy info.
- Examining shoot strikes often reveals a larva (which shows developmental status).
- Scouting for fruit entries also indicates infestation levels.



Timing and Coverage

- If a spray is necessary, timing and coverage are *critical*.
- PTB larvae are only intermittently accessible to sprays.
- Shoots and fruit grow (!), thus presenting lots of unprotected substrate and food for the larvae.



Effective Materials for PTB Control

COMMERCIAL

- Azinphosmethyl (*Guthion*, can buy until Aug 31st, use through 2005)
- Bt (*DiPel*, *Crymax*)
- Carbaryl (*Sevin*)
- Cyhalothrin (*Warrior*)
- Diazinon
- Diflubenzuron (*Dimilin*)
- Endosulfan (*Thiodan*)
- Esfenvalerate (*Asana*)
- Malathion
- Methoxyfenozide (*Intrepid*)
- Permethrin (*Pounce*, *Ambush*)
- Pheromone Mating Disruption (*Checkmate* or *Isomate* dispensers)
- Spinosad (*Success*, *Entrust*, *Conserve*)
- Phosmet (*Imidan*)

HOME USE

- Bt (*Safer's Caterpillar Killer*)
- Carbaryl (*Sevin*)
- Esfenvalerate (*Ortho Bug B Gon*)
- Malathion
- Permethrin (*many formulations*)
- Spinosad (*Ferti-lome's Borer, Bagworm, and Caterpillar Spray*)

Control Strategies and Spray Timings

- Delayed-dormant*
- Bloom*
- Post-bloom
 - Mating disruption
 - Peak egg-hatch periods for each generation
 - Manual removal of shoot strikes with pruner
 - Removal/destruction of infested fruit



The Delayed-Dormant Spray

- Dormant Oil (Volck Supreme, Orchex, Sunspray Ultrafine) applied at 2% by volume (spray to drip).
- Insecticide, if necessary, tank-mixed with fungicide/bactericide (copper, typically).
 - Insecticide usually Asana/Lorsban in CA
- Delayed-dormant app made from bud-swell to early popcorn (flowers not yet open).

Bloom Sprays for PTB

- Bt, spinosad, or diflubenzuron are all good for this timing.
- Two (2) Bt or spinosad (Success/Entrust/Ferti-lome) sprays at bloom
 - 1st shot at early bloom (10-20% bloom)
 - 2nd shot at full bloom (before petal fall)
- Or, one (1) application of diflubenzuron (Dimilin) around mid-bloom (20-50% bloom).
- For backyard growers, these sprays may be the most important because of the lack of in-season materials and issues with canopy coverage.

In-Season PTB Sprays

- A variety of materials is available for commercial growers (commonly used: Imidan, Success, Asana, DiPel, and Guthion).
- Backyard growers can purchase and use the same active ingredients in Success, Asana, and DiPel.
- Using degree-day totals (post-biofix), sprays are generally made at 300-400 DD, and if pest pressure is high, again 10-14 days later.
- If you “reset” your biofix for each flight, you can maintain the precision in your spray timings. Mating disruption, however, precludes growers from resetting a biofix.
- Be careful and read all label information. Bear in mind that *Asana can flare mites mid-season*, and *Guthion residues probably won't be tolerated on peaches after 2005*)

Some Important In-Season Numbers

(Degree-Days post-biofix)

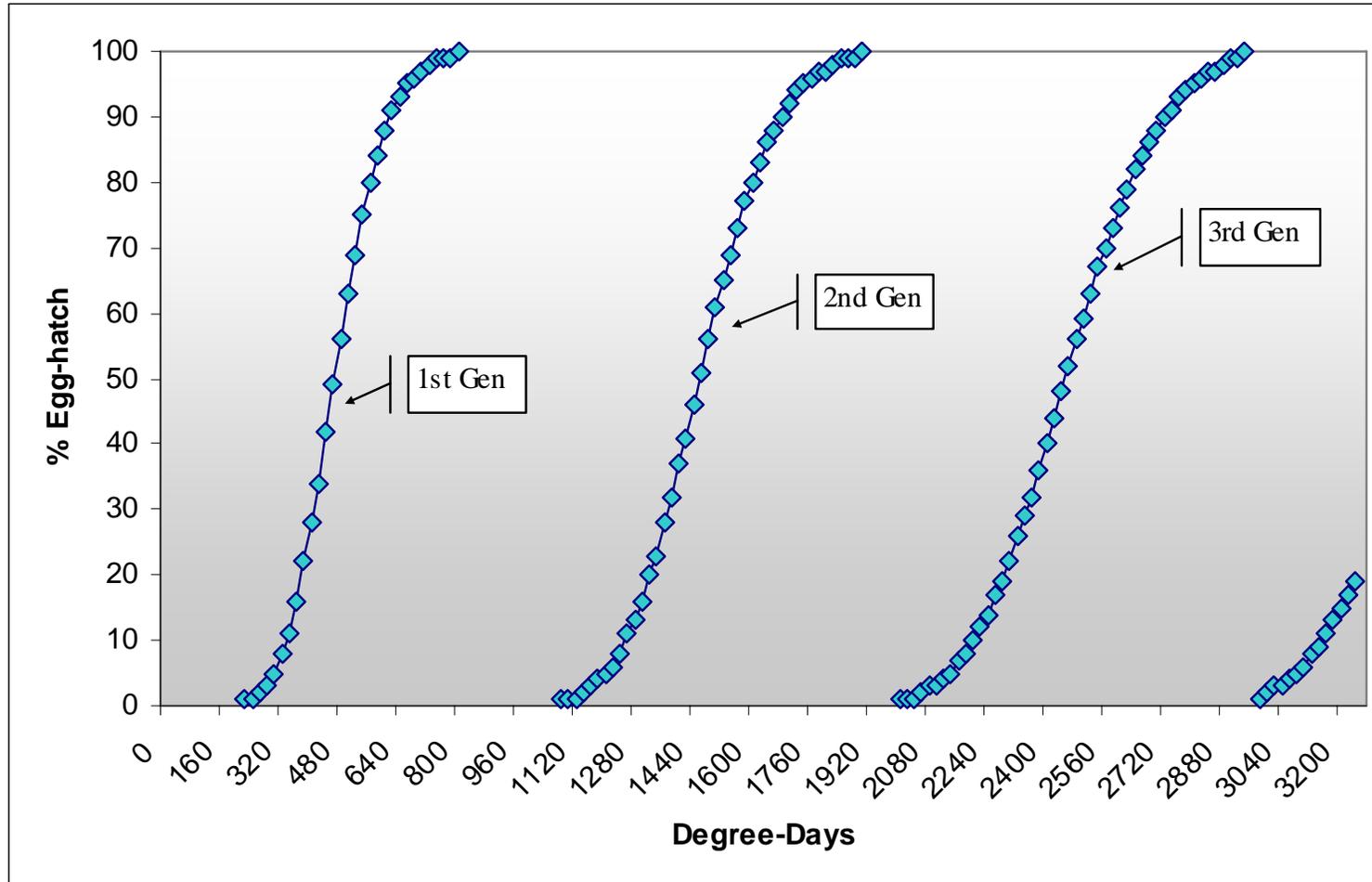
1st Generation

- 60 DD => egg-laying begins
- 220 DD => egg-hatch begins
- **320 DD => peak egg-hatch starts**
- **600 DD => peak egg-hatch winds down**
- 740 DD => egg-hatch essentially over

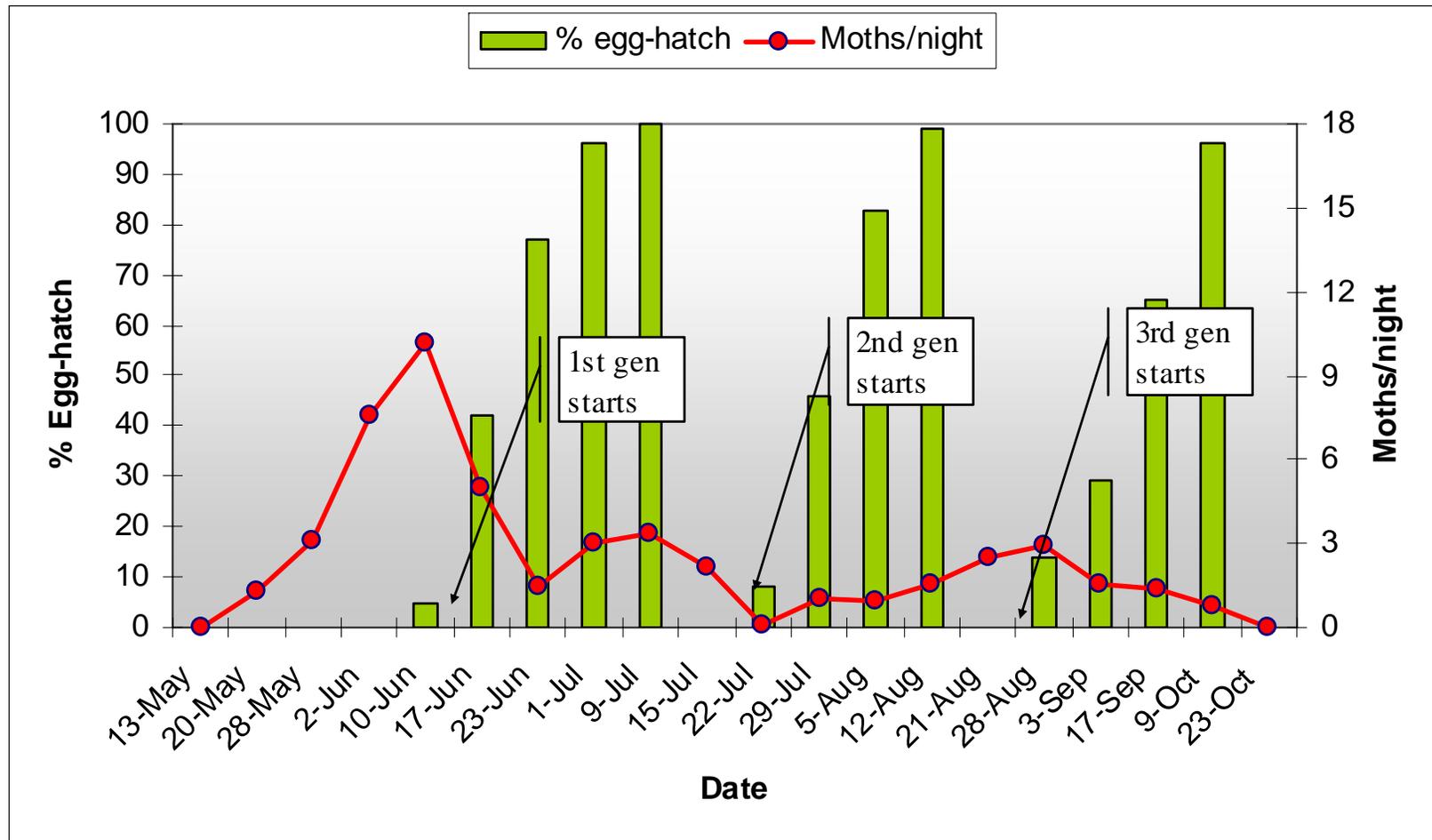
2nd Generation

- 920 DD => egg-laying begins
- 1080 DD => egg-hatch begins
- **1260 DD => peak egg-hatch starts**
- **1660 DD => peak egg-hatch winds down**
- 1840 DD => egg-hatch essentially over

General PTB Egg-hatch



Egg-Hatch Relative to Flight



In-Season Sprays

- If trapping is maintained throughout the season, applications can be made 7-14 days following each flight's biofix.
- Alternatively, spraying at or soon after the peak flight will likely provide fresh insecticide residue as peak egg-hatch begins.
- Continue to monitor traps and *new* shoot strikes.

Thank You

- Shawn Steffan
 - IPM Project Leader
 - steffan@biology.usu.edu
 - 435-797-0776

 - www.extension.usu.edu/cooperative/ipd
 - www.extension.usu.edu/cooperative/ipm