



## Monitoring Codling Moth, Leafrollers and Lacanobia Fruitworm with New Lure Technologies

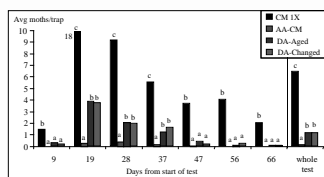
M.D. Doerr<sup>1</sup>, J.F. Brunner<sup>1</sup> and P.J. Landolt<sup>2</sup>  
<sup>1</sup> WSU- Tree Fruit Research and Extension Center, Wenatchee, WA  
<sup>2</sup> USDA-ARS, Wapato, WA

### Acknowledgement

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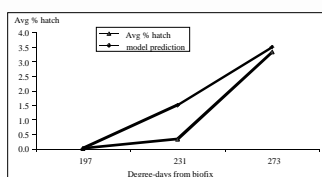
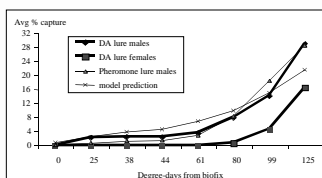
### Use of "DA Lure" to Monitor Codling Moth

- ◆ The pear ester DA 2313 ("DA Lure", Trécé, Inc.) attracts both male and female codling moth
  - Attraction of both sexes a significant advance for understanding female behavior
- ◆ We continue to develop information for interpreting codling moth captures in DA lure baited sticky traps
  - Potential improvement for predicting fruit damage
  - Opportunity to validate degree-day model by monitoring female behavior
- ◆ Data presented below from non-pheromone treated orchards



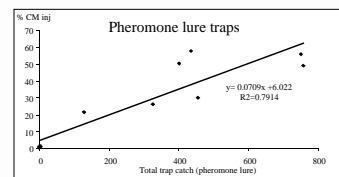
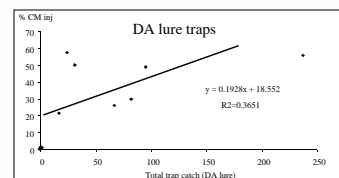
- ◆ DA lure attracted approximately 10-15% as many moths as the pheromone lure during both generations
- ◆ The DA lure maintained its attractivity relative to a "fresh" lure for an entire generation

### DA Lure to Validate CM Model Predictions



- ◆ Male captures in DA lure baited traps were closely correlated with pheromone lure traps and DD model predictions
- ◆ Female capture was delayed about 80 DD
  - approximately 80% of the females captured were mated at 80DD
- ◆ Delayed capture of 1st female did not correspond to an inaccurate prediction of the first observed egg hatch

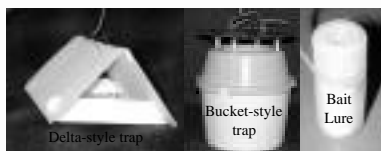
### DA Lure to Predict Injury



- ◆ In NON-PHEROMONE treated orchards the DA lure did not represent an improvement over the standard pheromone lure for predicting fruit injury
  - Majority of orchards had extremely high pressure
  - Orchards received no treatments to suppress CM injury, including pesticides or mating disruption

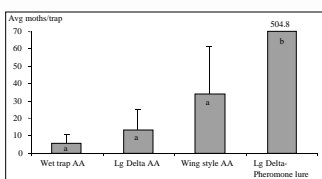
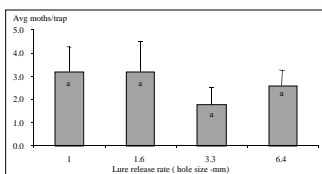
### Use of "Bait Lures" to Monitor Obliquebanded LR and Lacanobia Fruitworm

- ◆ Acetic acid-based monitoring systems developed by Dr. Peter Landolt
  - Attraction of both sexes a significant advance for understanding female behavior
- ◆ We continue to develop these monitoring systems to optimize performance and create action thresholds based on captures
  - Potential improvement for predicting in-orchard population levels
  - Opportunity to validate degree-day model by monitoring female behavior
- ◆ Data presented below from non-pheromone treated orchards



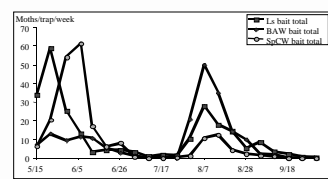
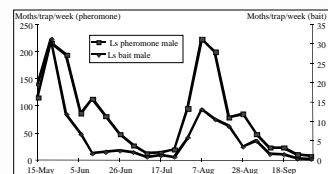
- ◆ Large Delta-style trap used to monitor OBLR
- ◆ Bucket-style trap with "kill strip" necessary to monitor lacanobia fruitworm due to large numbers of captures
- ◆ Release rate in bait lures controlled by hole size in lid on vial

### Optimizing Bait Monitoring of OBLR



- ◆ No consistent release-rate effect noted with bait lures
  - 3.3 mm hole size optimal with pandemis leafroller, should be sufficient with both species
- ◆ Either Delta-style or Wing-style traps should be sufficient for monitoring leafroller without significant differences
- ◆ Bait lure traps attracted about 6% as many moths as pheromone traps during the second generation

### Bait Monitoring of Noctuid Pests



- ◆ Bait lure and pheromone lure captures of lacanobia fruitworm adults closely correlated for both generations
- ◆ Bait lure attracts other key orchard pests in large numbers
  - Bertha armyworm and spotted cutworm
- ◆ Could be an ideal formulation for an "Attract and Kill" product