

BMSB AND BLUEBERRIES

Updates from 2012



Objective: 1. Establish Biology and Phenology in Specialty Crops



Funding



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Specialty Crop Research Initiative
Grant #2011-01413-30937

Collaborating Institutions



Cornell University



Virginia Tech



Objective: 1. Establish Biology and Phenology in Specialty Crops

- 1.2.1. Establish the impact of BMSB presence and feeding on small fruit
- 1.3.1 Determine BMSB phenology and impact on specialty crops
 - I. Conducted BMSB transect walks
 - II. Examined BMSB damage on blueberries
 - III. BMSB Inducibility



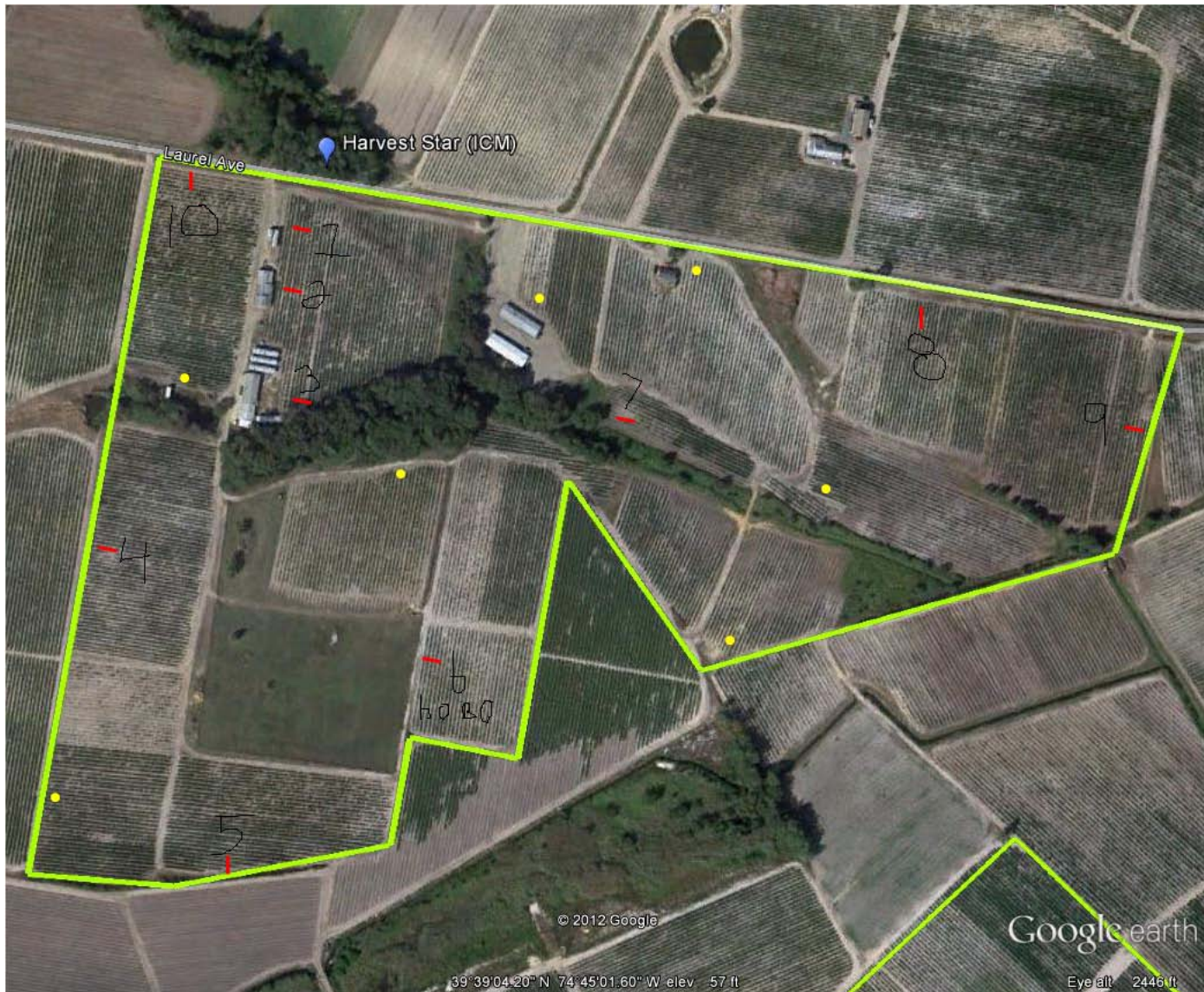
Methods I. Conducted BMSB transect walks

- BMSB counts taken at 8 farms weekly
- 3 minute walk / transect
- May 30th – August 20th
 - Farms (# of transects at each farm)
 - ABC (23)
 - R&S (9)
 - Macrie (16)
 - Merlino (5)
 - Harvest Star (10)
 - Del Rossi (16)
 - Whalens (8)
 - Donio (4)

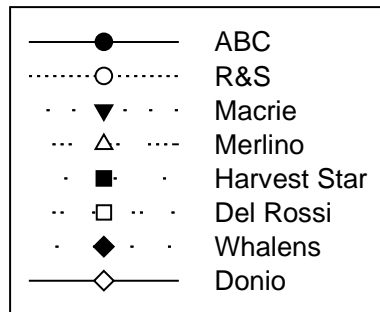
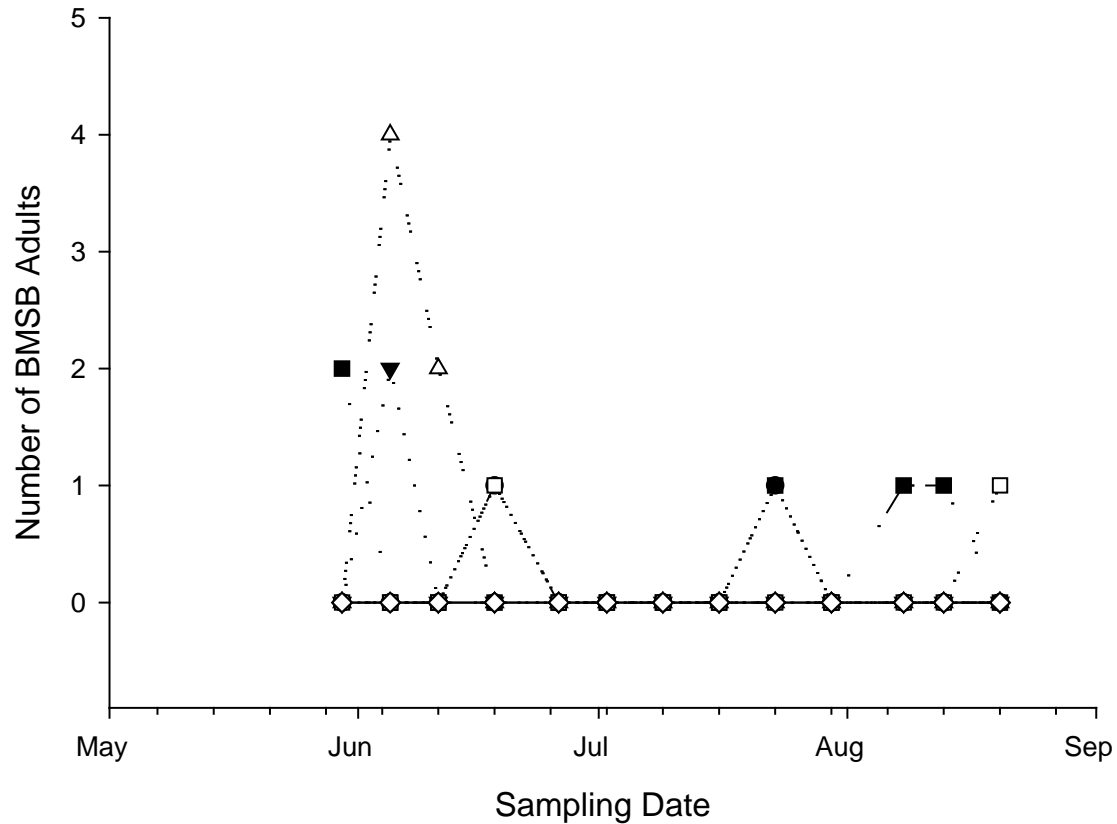
Whalen Blueberry Farm



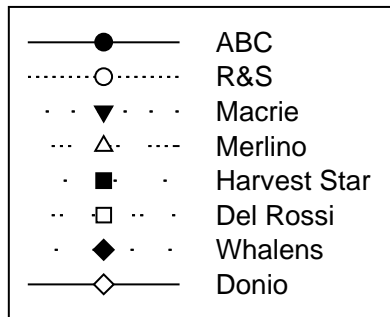
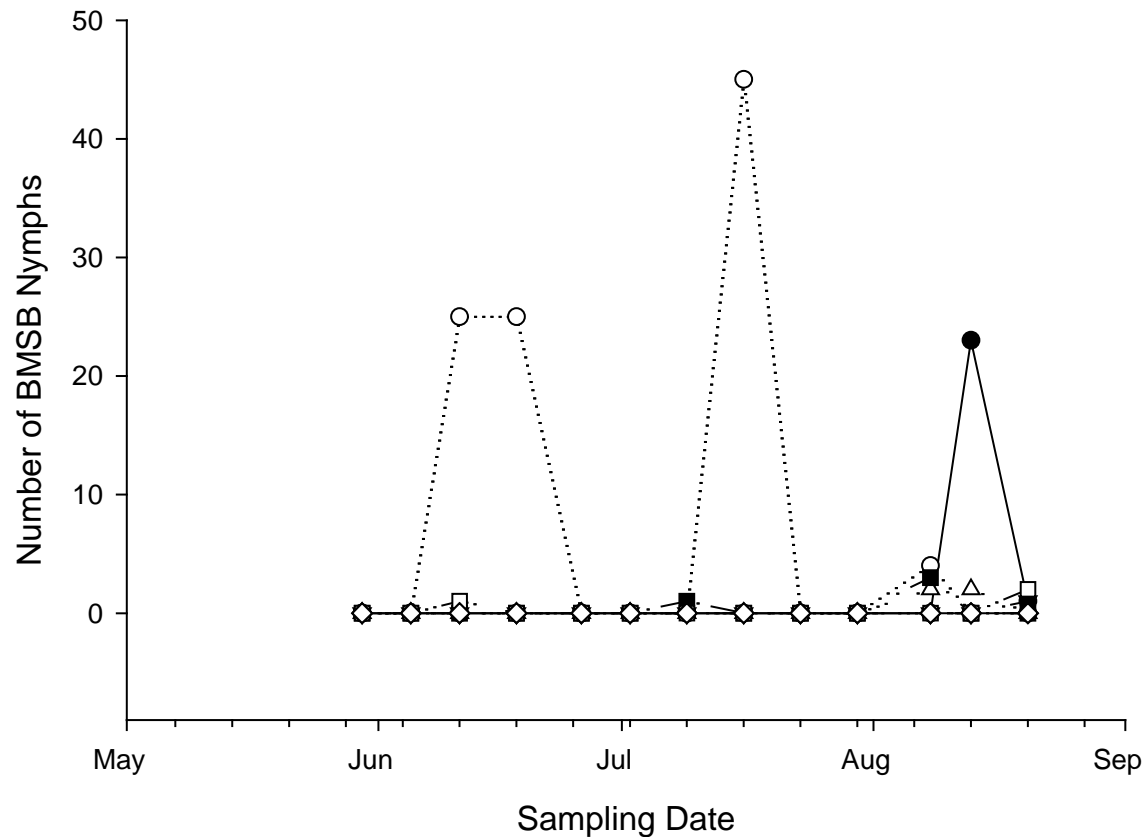
Harvest Star



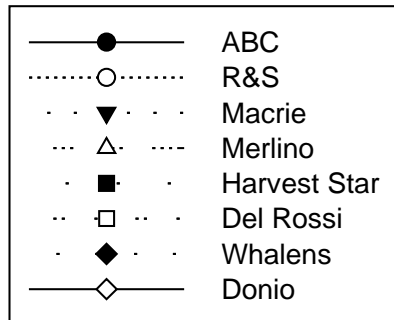
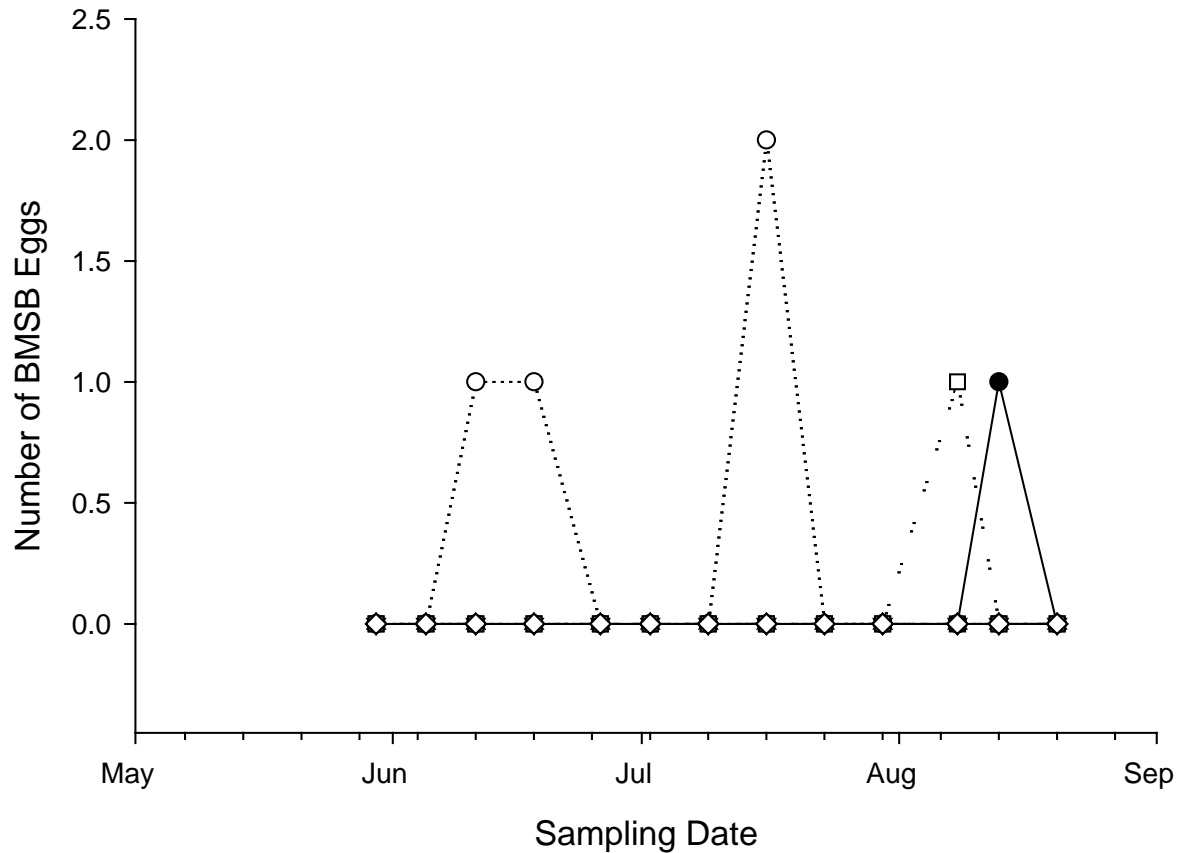
Results BMSB Adult Transect



Results BMSB Nymph Transect



Results BMSB Egg Transect



II. Examined BMSB damage on blueberries

- Objectives
- 1.2.1. Establish the impact of BMSB presence and feeding on small fruit
- 1.3.1 Determine BMSB phenology and impact on specialty crops

Methods II. Examined BMSB damage on blueberries

- BMSB adults or nymphs
 - 0, 1, 2 or 5
- Caged BMSB on blueberries
 - Each week BMSB treatment was moved to another bag on the same bush
 - 5 weeks total

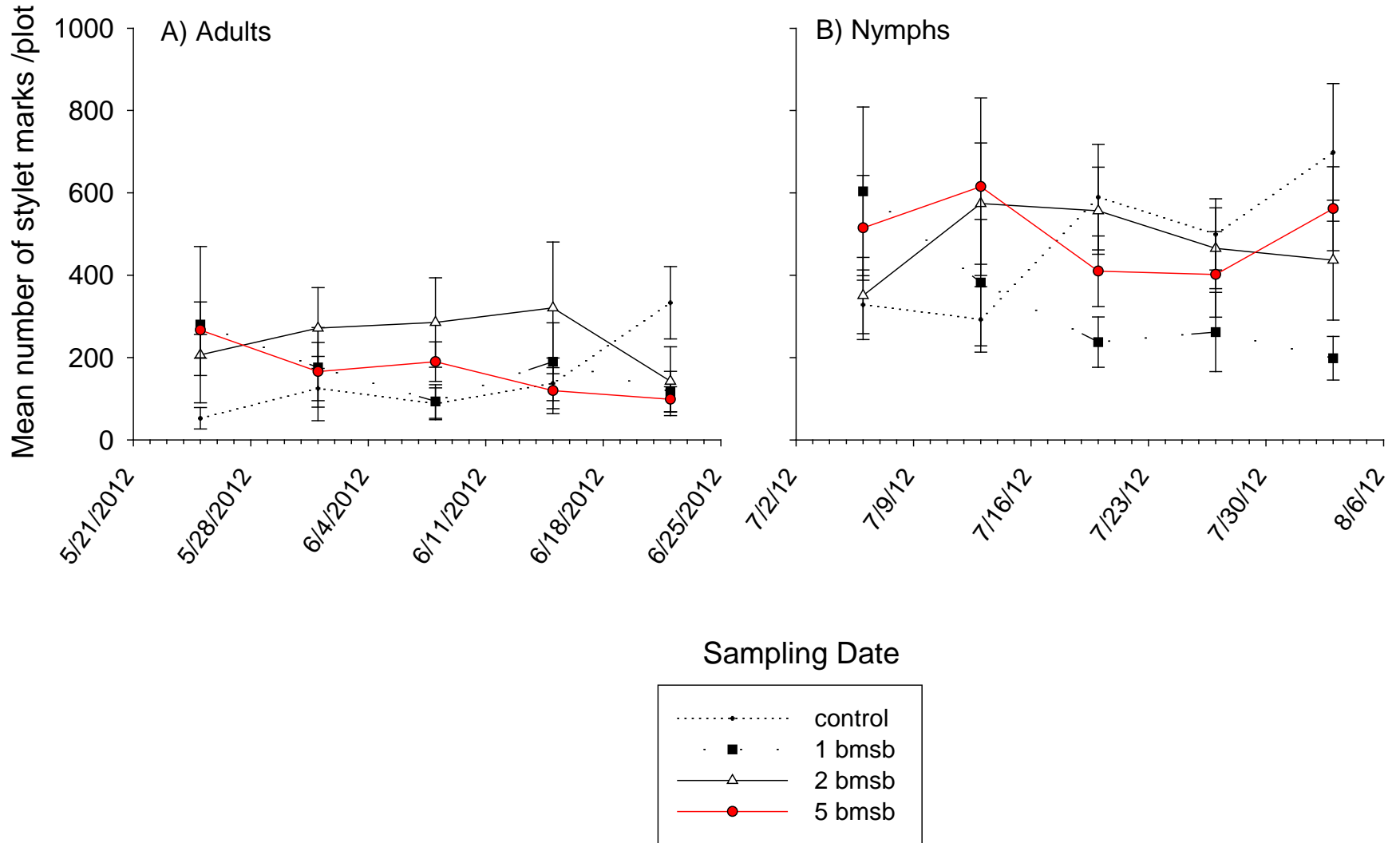


Methods II. Continued

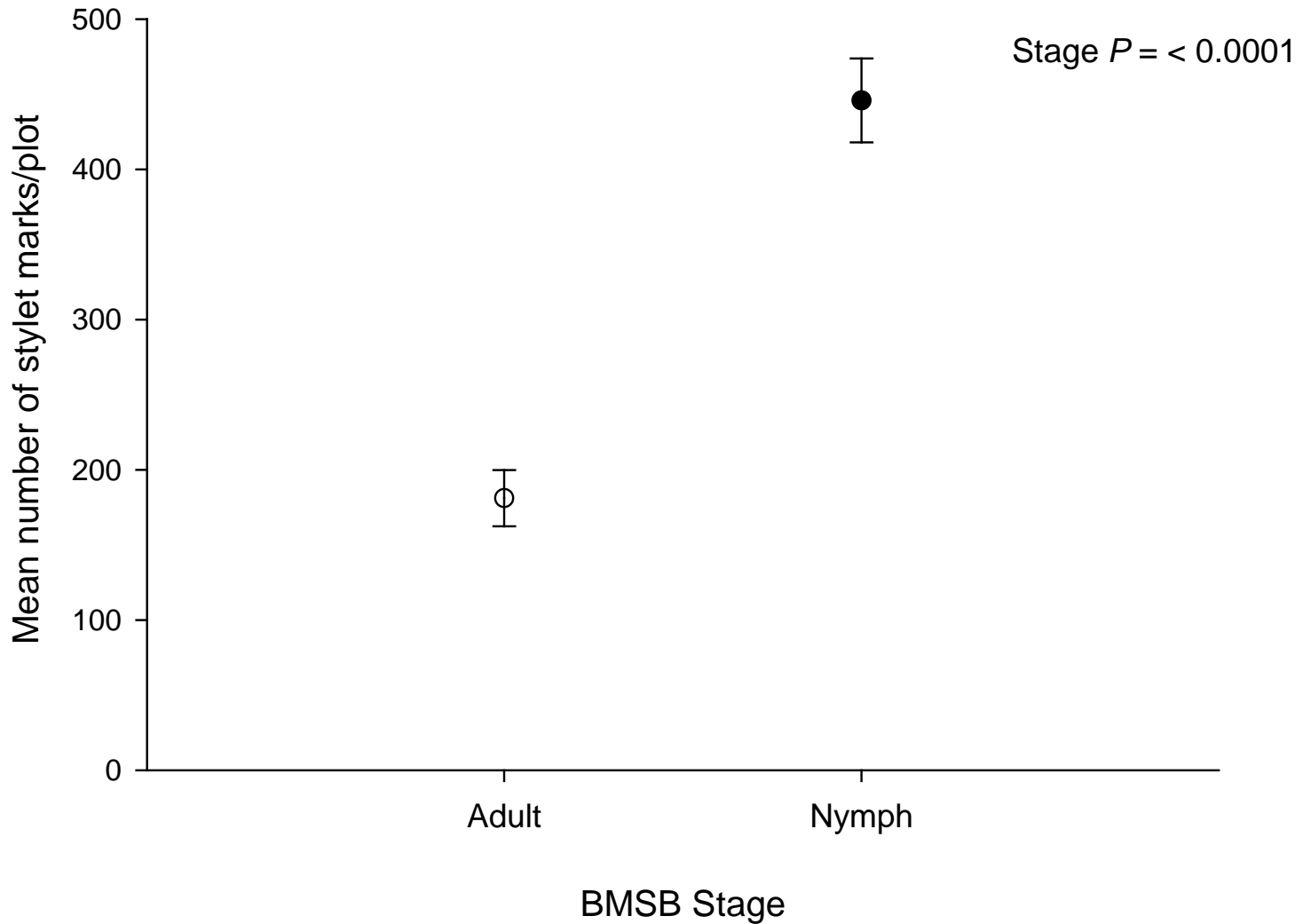
- Harvested berries
 - Recorded % discoloration
 - Recorded the number of berries in the bag (berries aborted)
 - Recorded number of stylet marks
 - Dissected berry and recorded % necrosis



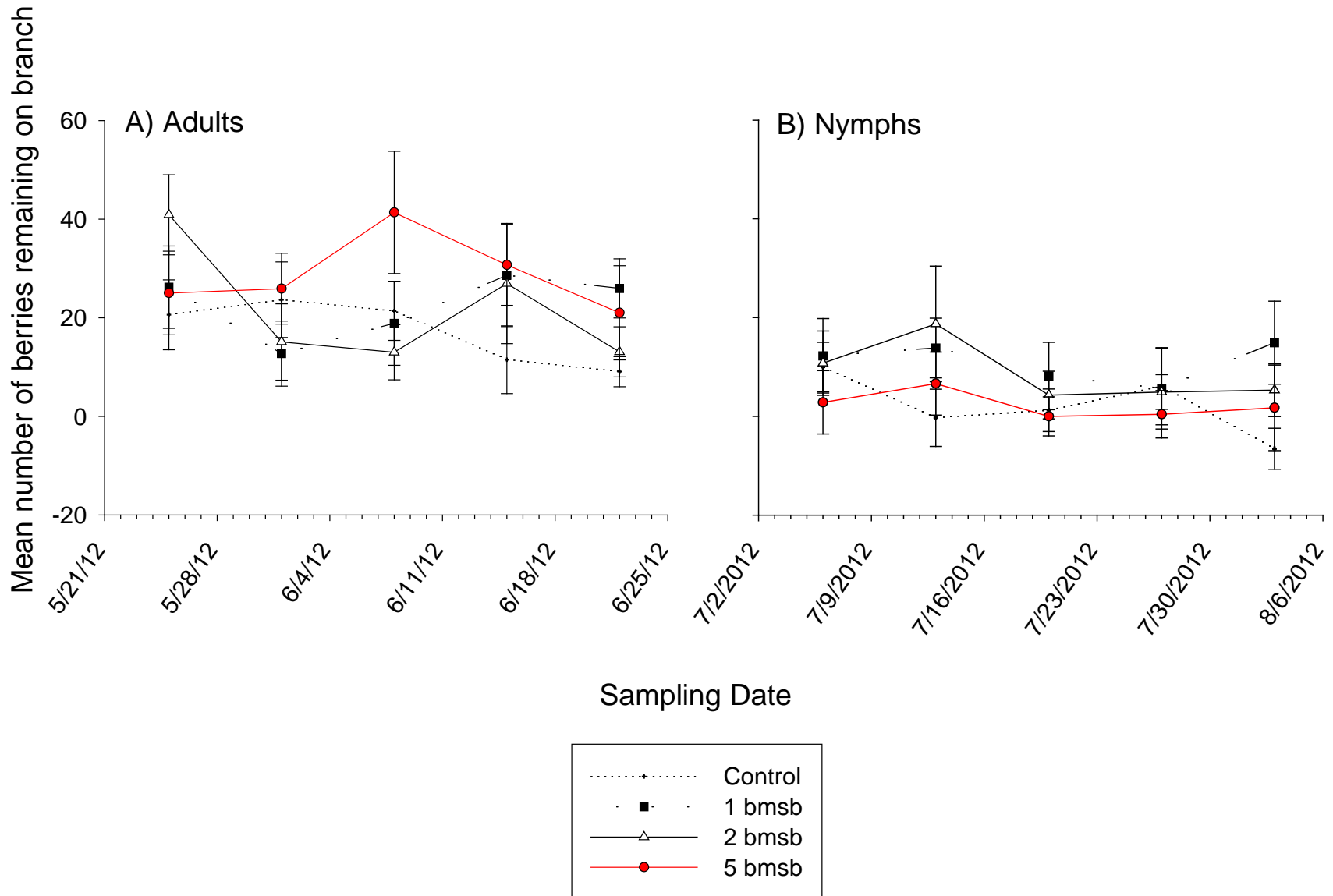
Results Stylet Marks



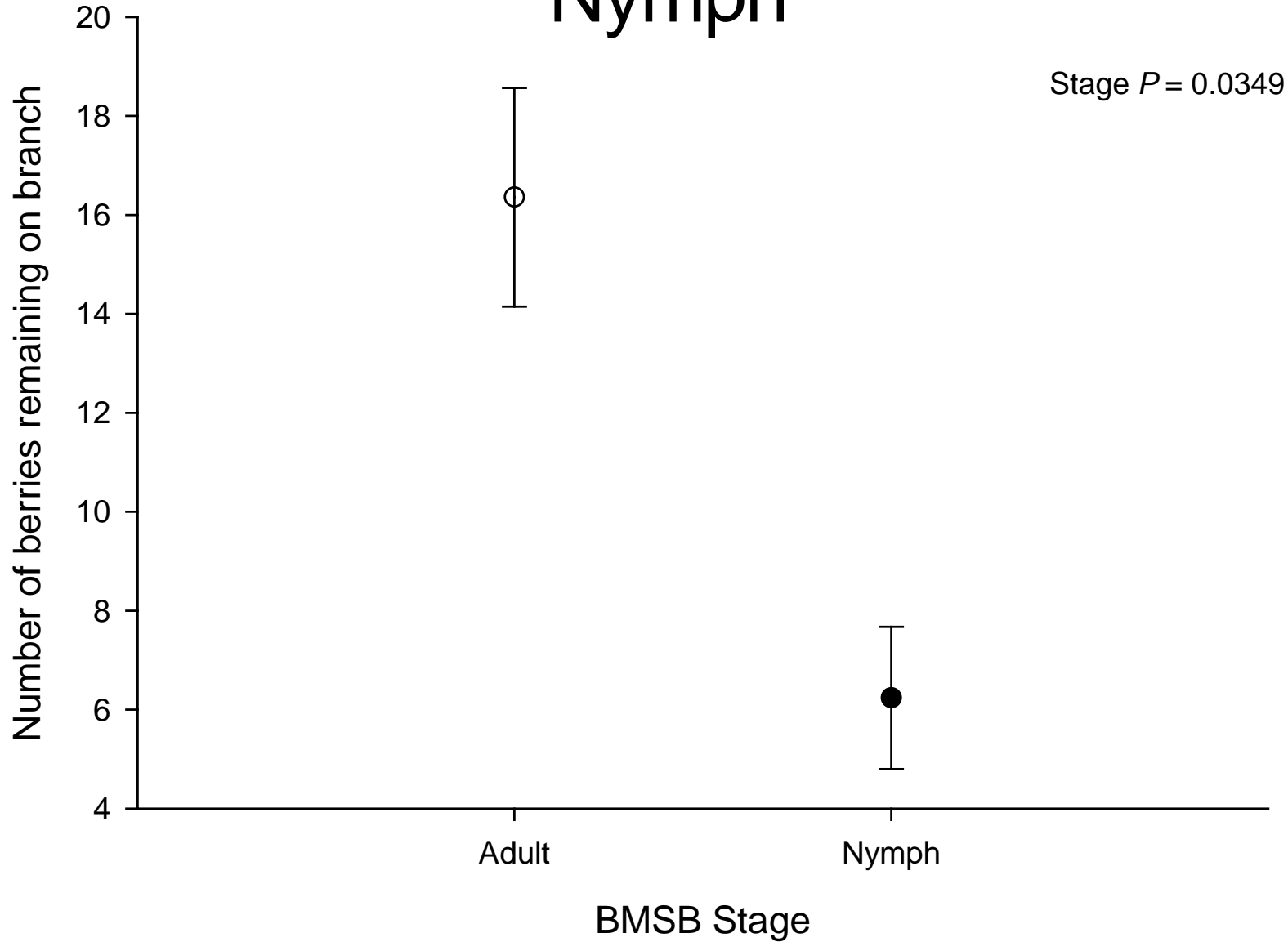
Style Marks Adult vs. Nymphs



Results Berries Remaining on Branch



Berries Remaining on Branch Adult vs. Nymph



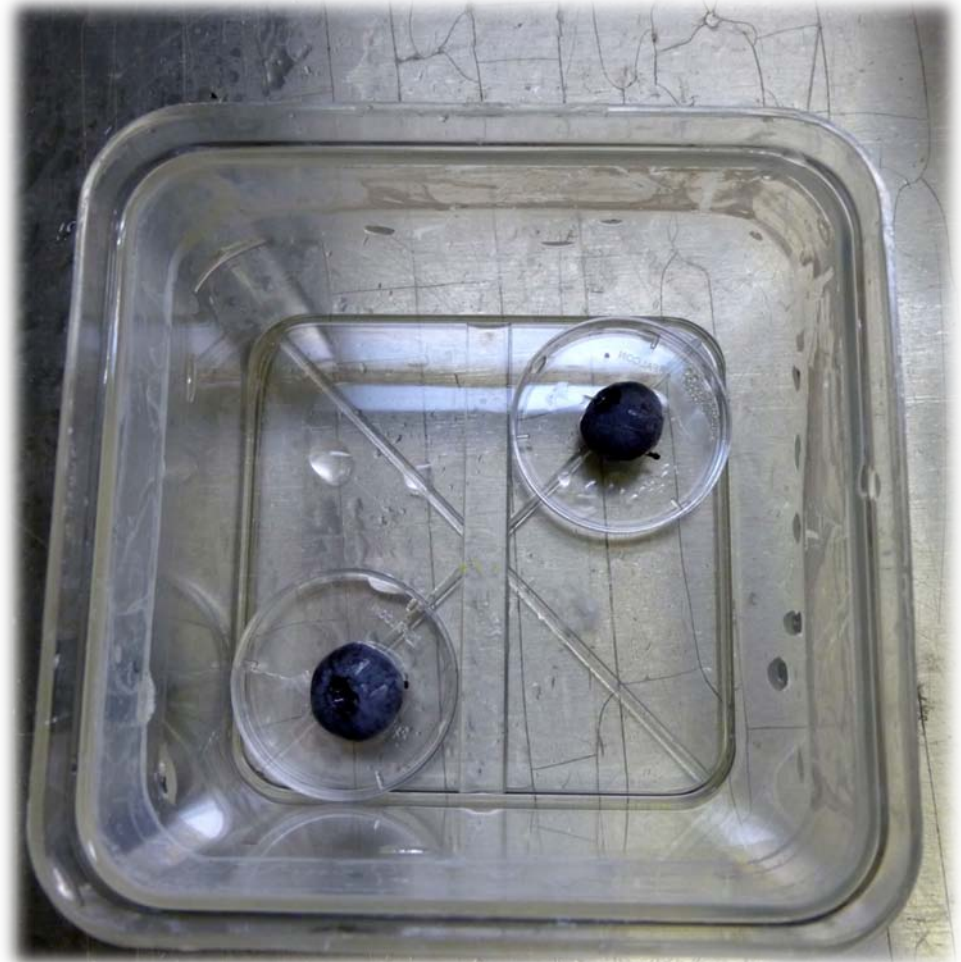
III. Inducibility

- Objectives
 - 1.2.1. Establish the impact of BMSB presence and feeding on small fruit
 - 1.3.1 Determine BMSB phenology and impact on specialty crops
- We are investigating if and how BMSB damage impacts
 - Host acceptance: choice test
 - Blueberry health: proanthocyanidin, Brix and more...(in progress)
 - HIPVs (in progress)

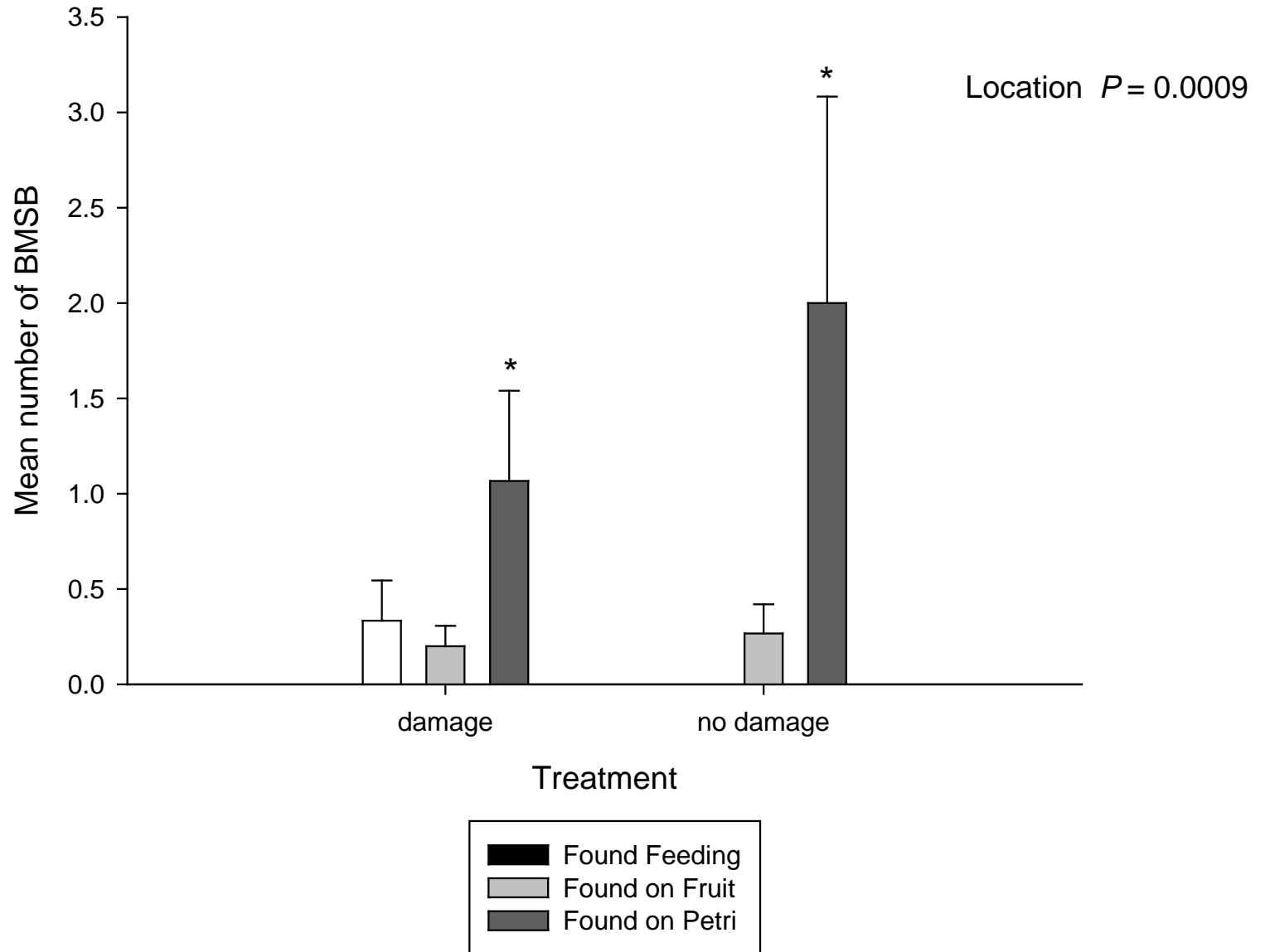
Methods: Choice Test

Choice Test Arena

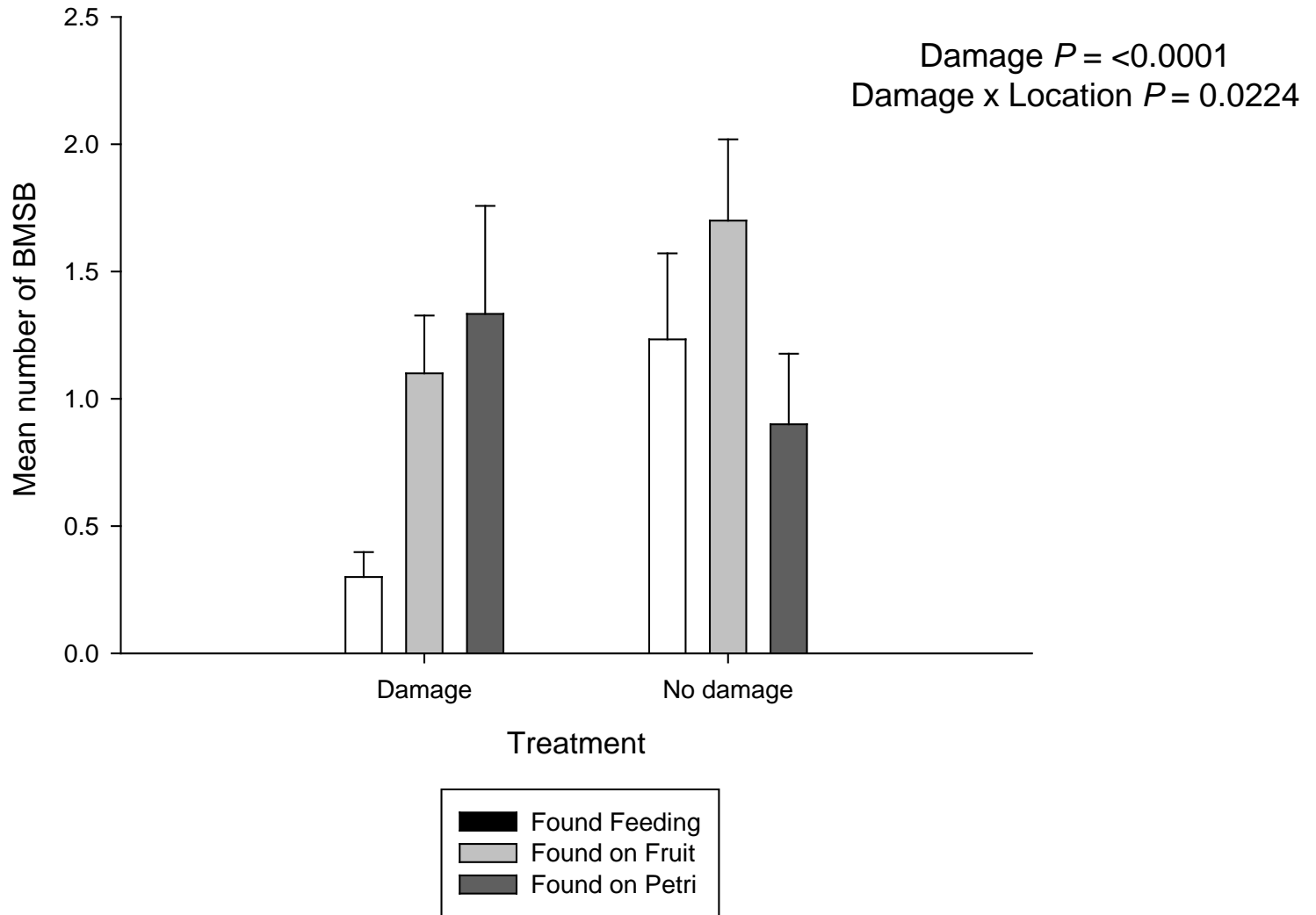
- BMSB nymphs
- Blueberry
 - Damaged for 24 or 72 hours by BMSB feeding
 - No feeding damage
- Recorded
 - Every hour for 10 hours for a total of 3 days
 - Found feeding on blueberry
 - Found on blueberry
 - Found on petri plate



Results 24 Hours of Feeding Damage



Results 72 Hour of Feeding Damage

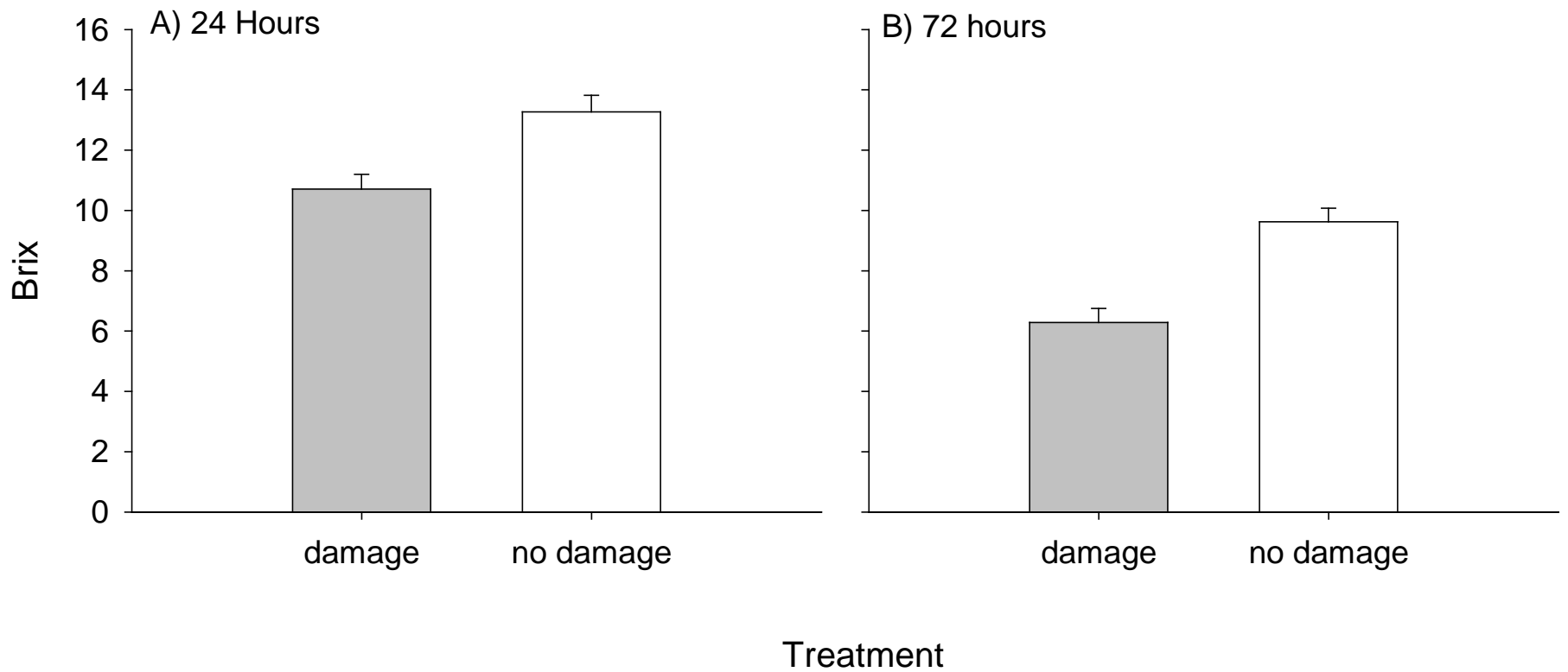


Methods: Brix

- BMSB nymphs
- Blueberry
 - Damaged for 24 or 72 hours by BMSB feeding
 - No feeding damage
- Using refractometer measured Brix (total soluble solids) level

Results Brix

Treatment $P = < 0.0001$

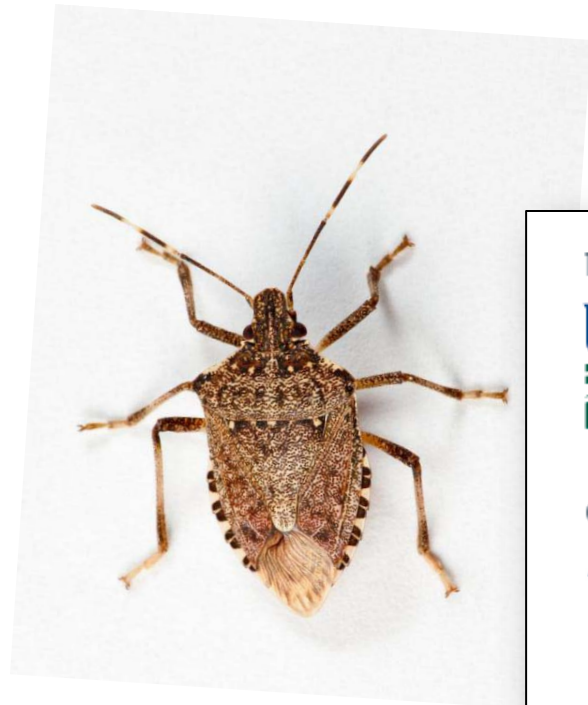


Conclusion

- All experiments will be repeated and tweaked
- We will expand on the inducibility experiments to include
 - Examine BMSB saliva as a factor
 - Include different varieties of blueberries
 - Investigate how/if generalist natural enemies respond to HIPVs emitted after BMSB damage



Objective: 2. Develop Monitoring and Management Tools for BMSB



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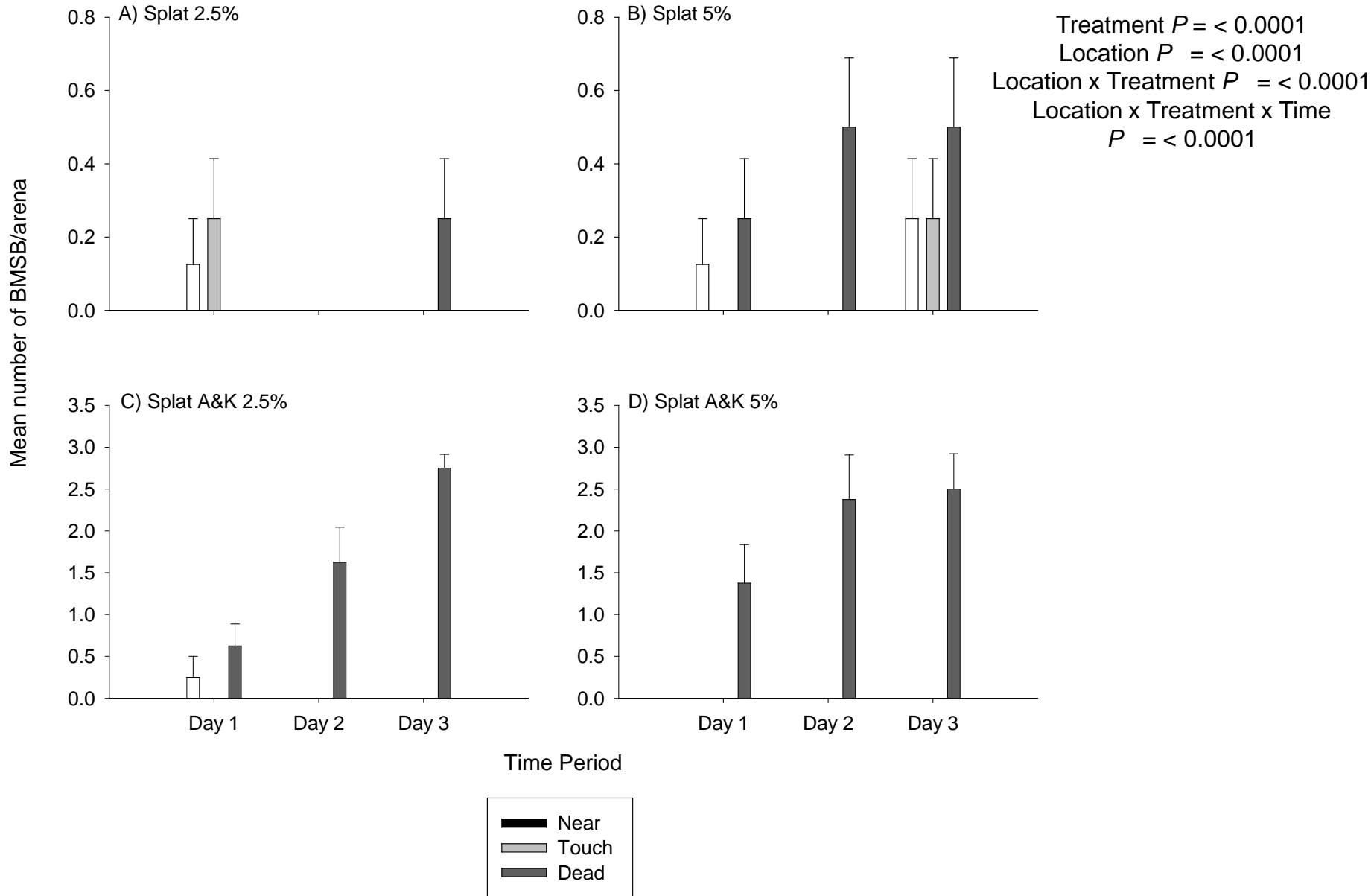
- 2.2.1. Evaluate efficacy of registered and developmental insecticides against BMSB.
 - IV. SPLAT attract and kill bioassays

Methods IV. SPLAT Bioassays

- Treatments
 - SPLAT for attraction of BMSB (2.5%)
 - SPLAT for attraction of BMSB (5%)
 - SPLAT for A&K of BMSB (2.5%)
 - SPLAT for A&K of BMSB (5%)
 - SPLAT control
- 1 g dollop per arena
- 5 3rd or 4th instar nymphs
- 4 replications/treatment
- Recorded
 - mortality every 6 and 12 hours for 3 days
- All arenas contained green beans, carrots, sunflower seeds and water



Results IV. SPLAT Bioassays



Acknowledgements

- Joyce Parker – post-doc.
- Field Crew: Brian Tilton, Patty Giron, Stephanie Reynolds, Ryan Landolfi.
- Funding: USDA SCRI.

