Sub-objective 1.4 Progress Report

George Hamilton

Rutgers University

Funding

USDA United States Department of Agriculture

National Institute of Food and Agriculture

Specialty Crop Research Initiative

Grant #2011-01413-30937

Collaborating Institutions

University of Delaware

ars

Penn State

The State University of New Jersey Rutgers

Northeastern IPM Center

Washington State University

Cornell University

University of Maryland

Virginia Tech

OSU Oregon State University

NC State University

Stop BMSB .org

1.4 - Identify landscape and temporal risk factors associated with BMSB on crops and in adjacent ecosystems

- Outcomes
  - Determine why and when BMSB leave one host plant for another
  - Determine where BSMB go when they leave
  - Predict BMSB seasonality and risks to other crops
- Methods
  - Monitor movement in and out of fields related to surrounding landscape
  - Monitor movement within fields
  - Techniques – black lights, visual counts, beating, traps, mark-recapture, homeowner reports
  - Map using GIS and geostatistics

The Players

- Rutgers
  - George Hamilton
  - Dean Polk
- University of Maryland
  - Brian Butler
  - Galen Dively
  - Holly Martinson
  - Michael Raupp
  - Paula Shrewsbury
- Oregon State
  - Peter Shearer
  - Silvia Rondon
  - Vaughn Walton
- Penn State University
  - Shelby Fleischer
  - John Tooker
- Virginia Tech
  - Doug Pfeiffer

Progress in 2012

- Presence of BMSB in NJ peach orchards affected by surrounding landscape – woods
- Presence of BMSB in MD nurseries affected by surrounding landscape – soybeans
- General Public Surveys – NJ, PA and Southern IPM Center

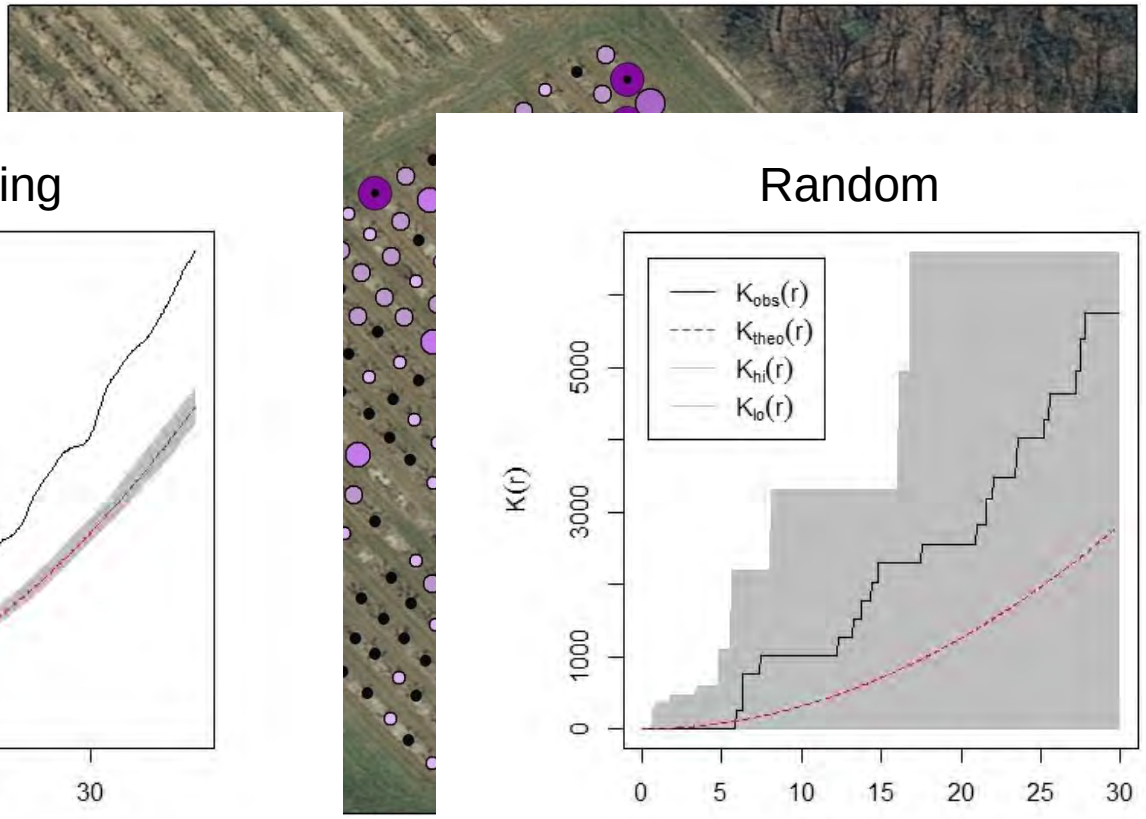
BMSB Spatial Patterns in Peaches

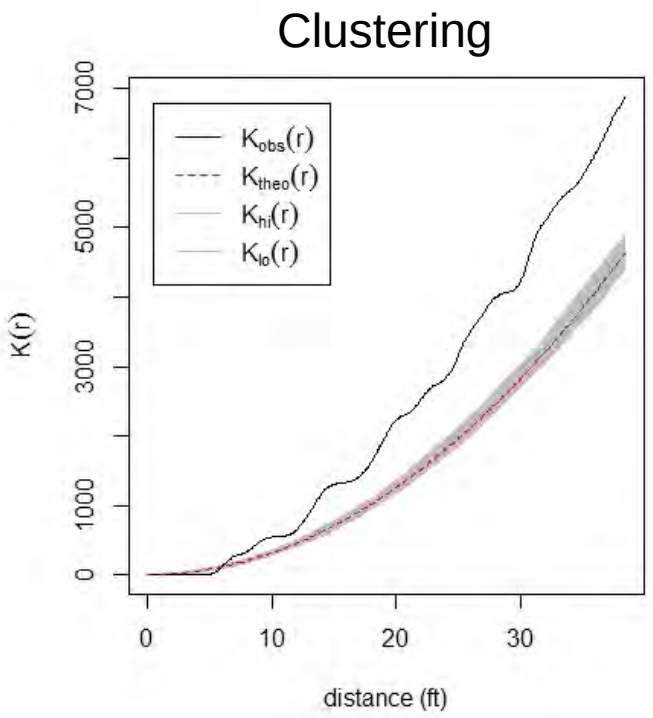
Noel Hahn & George Hamilton
Rutgers University

What spatial patterns do BMSB populations exhibit?

Analysis

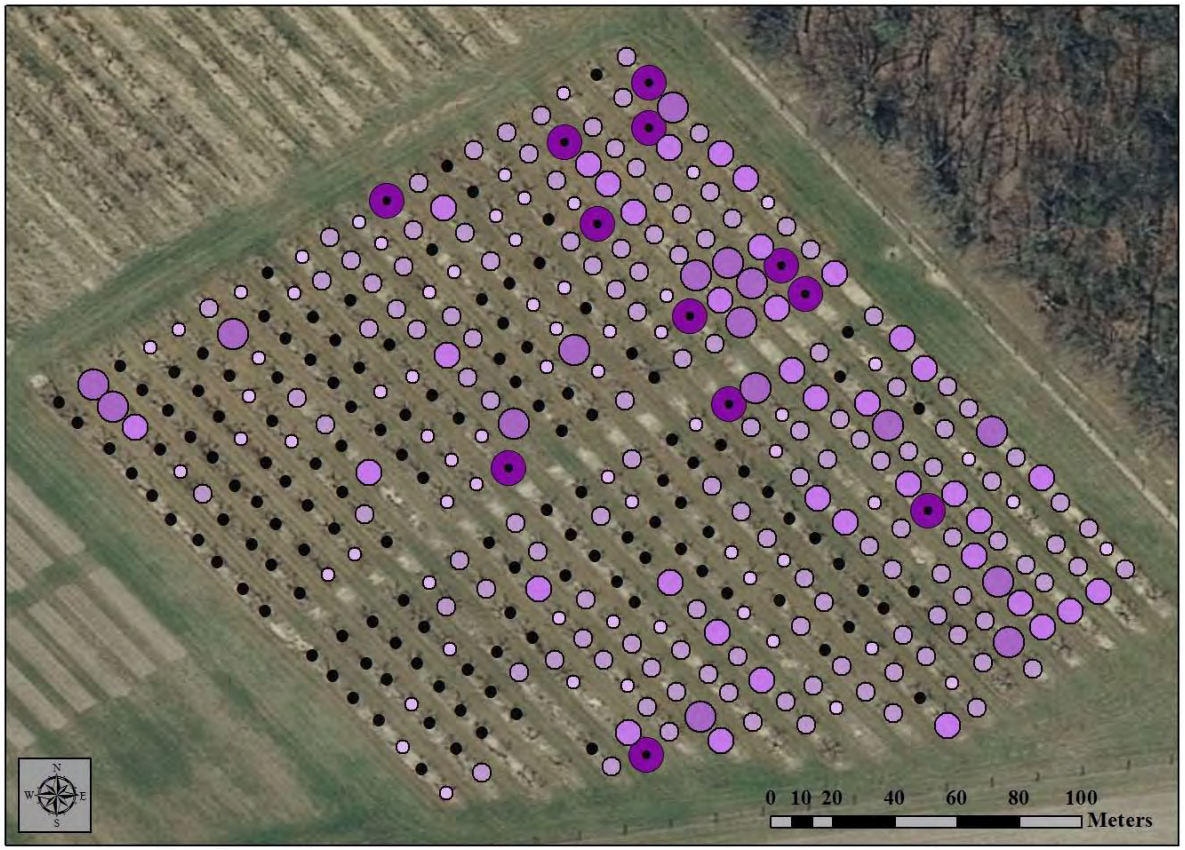
- Ripley's K

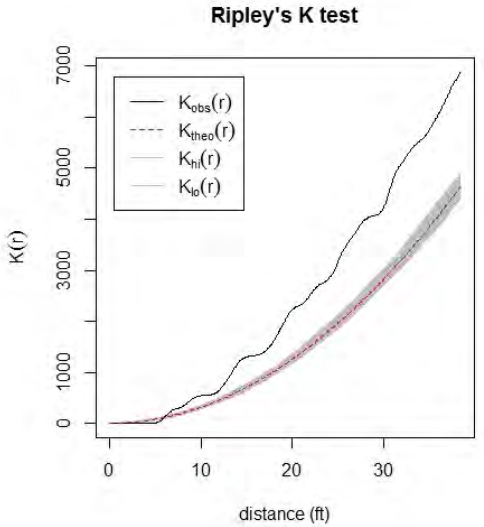




RAREC

7/26/2013





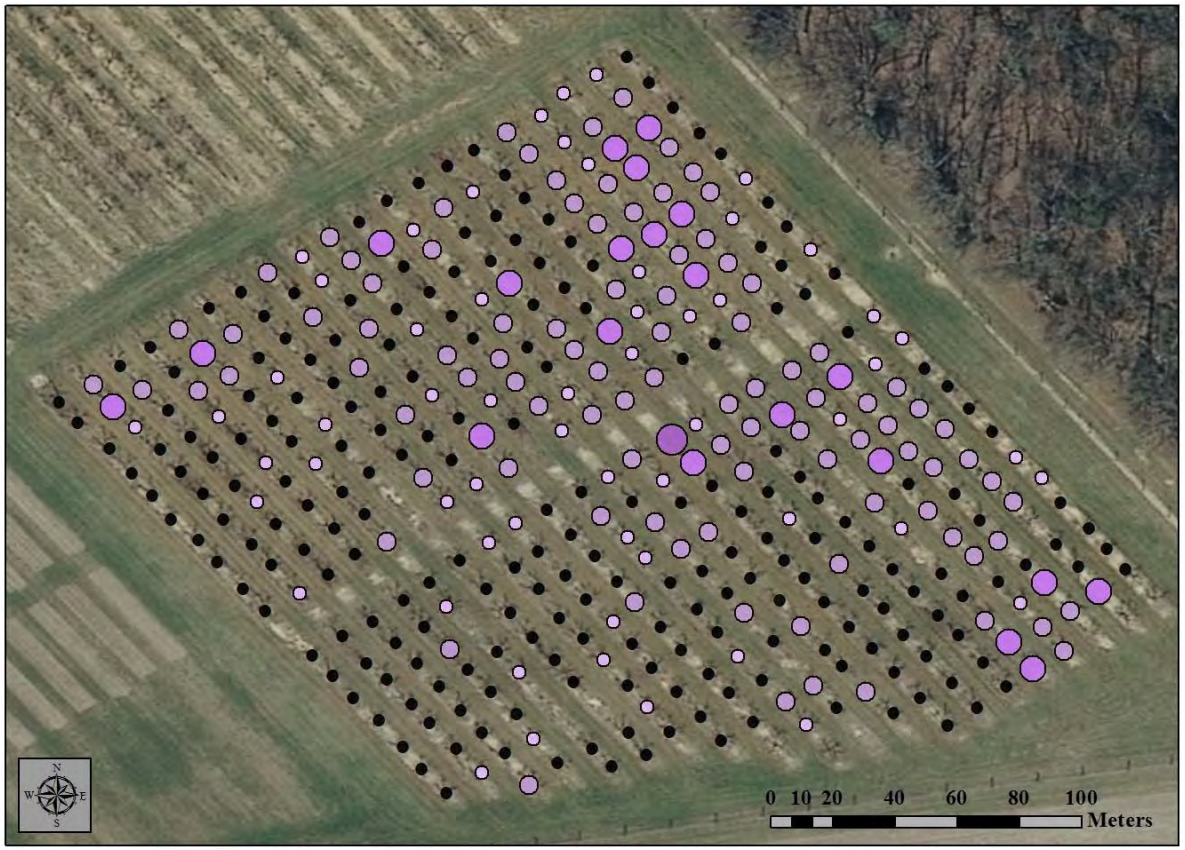
Count

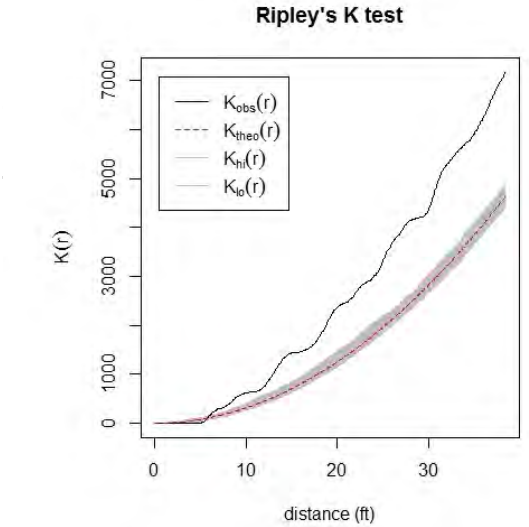
- 0
- 1
- 2-5
- 6-10
- 11-20
- >20

Clustering found

RAREC

8/29/2013





Count

- 0
- 1
- 2-5
- 6-10
- 11-20
- >20

Clustering found

What Can We Conclude

- That populations in this orchard appeared to be clustered throughout the season

- That the clustering in this orchard appears to be related to the adjacent woodlot

BMSB Movement Between Soybeans and Wooded Areas

Kevin Rice & John Tooker

Penn State University

Fluorescent Stink Bugs

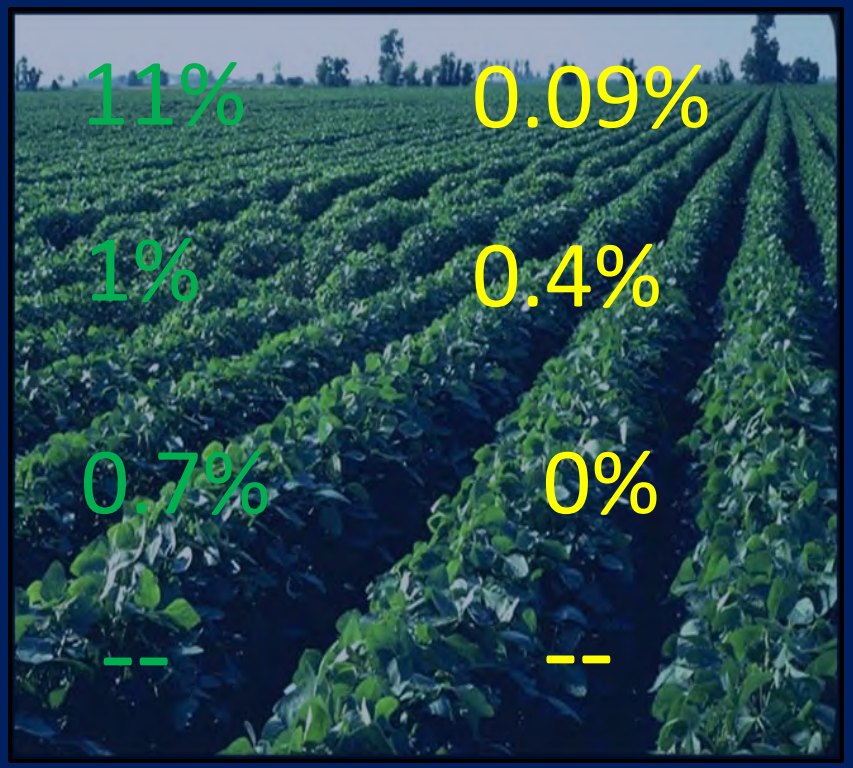
- Collected 3,000 BMSB from soybeans
- Half marked yellow, half marked green fluorescent sharpies
- Released and then followed at night for 4 weeks

Successful Recapture

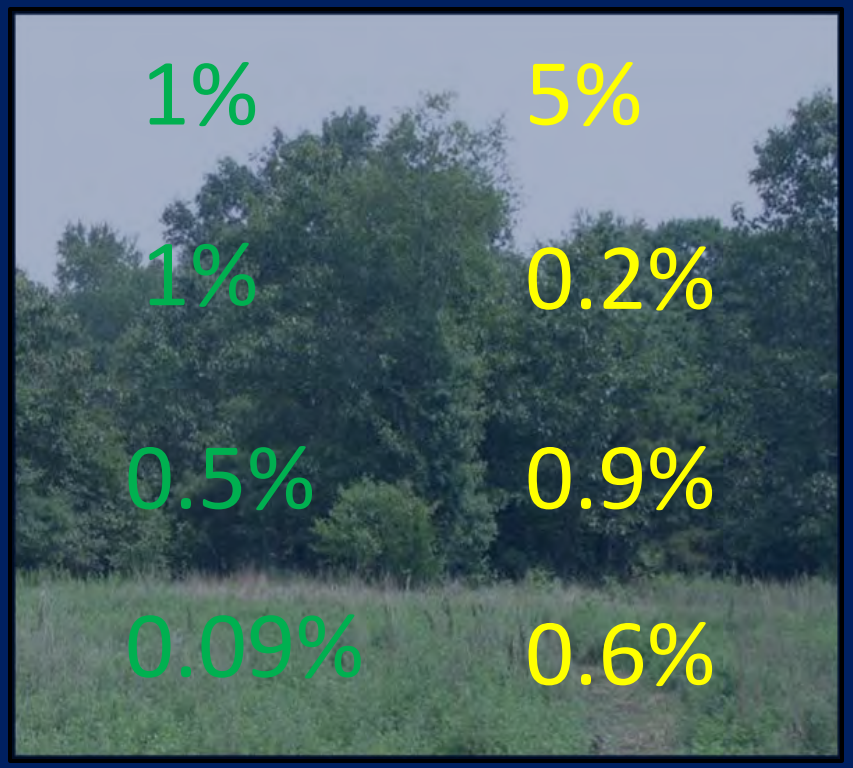
3 Consecutive Weeks

Released in Soy

Released in Woods

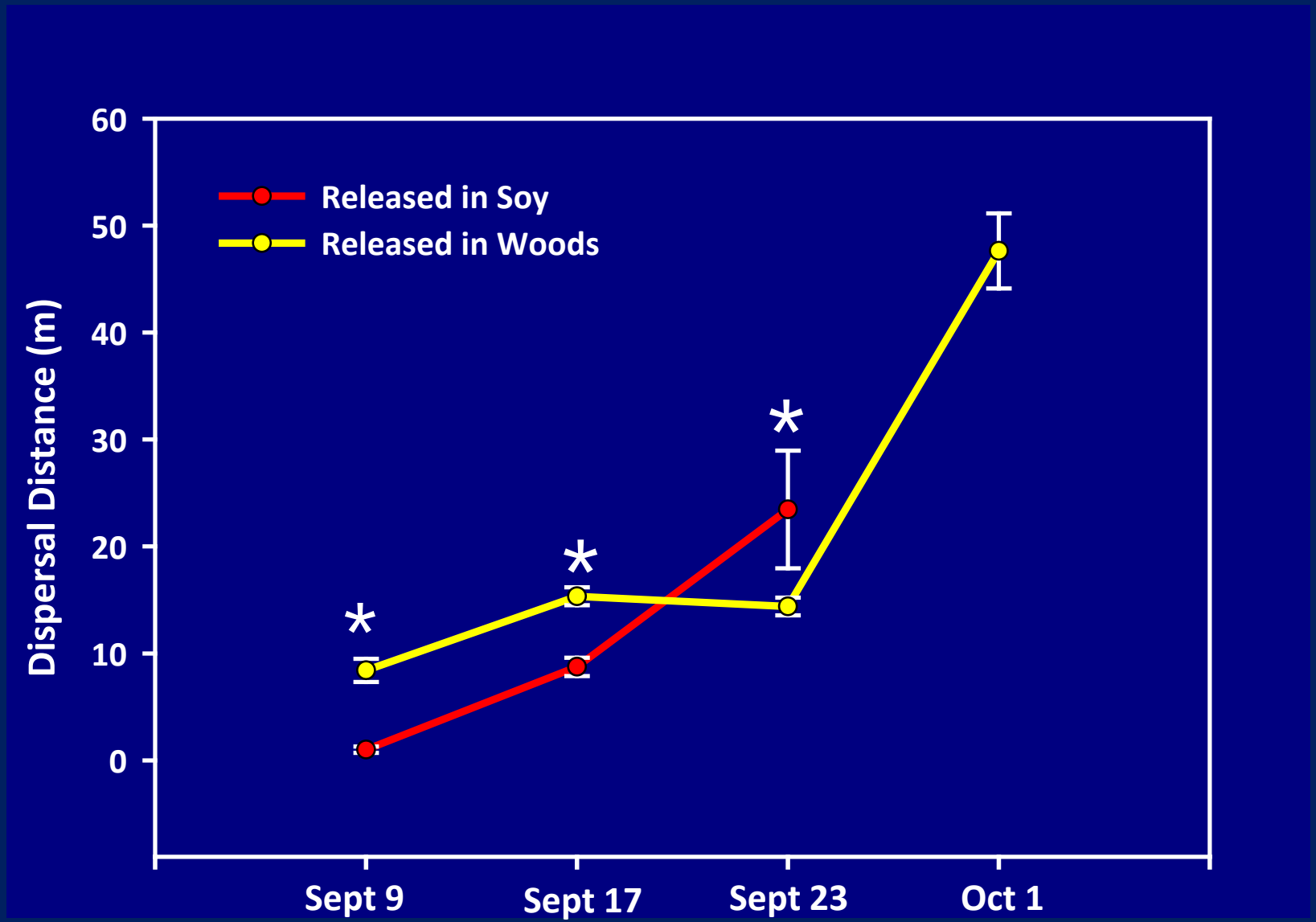


Recovered from Soy

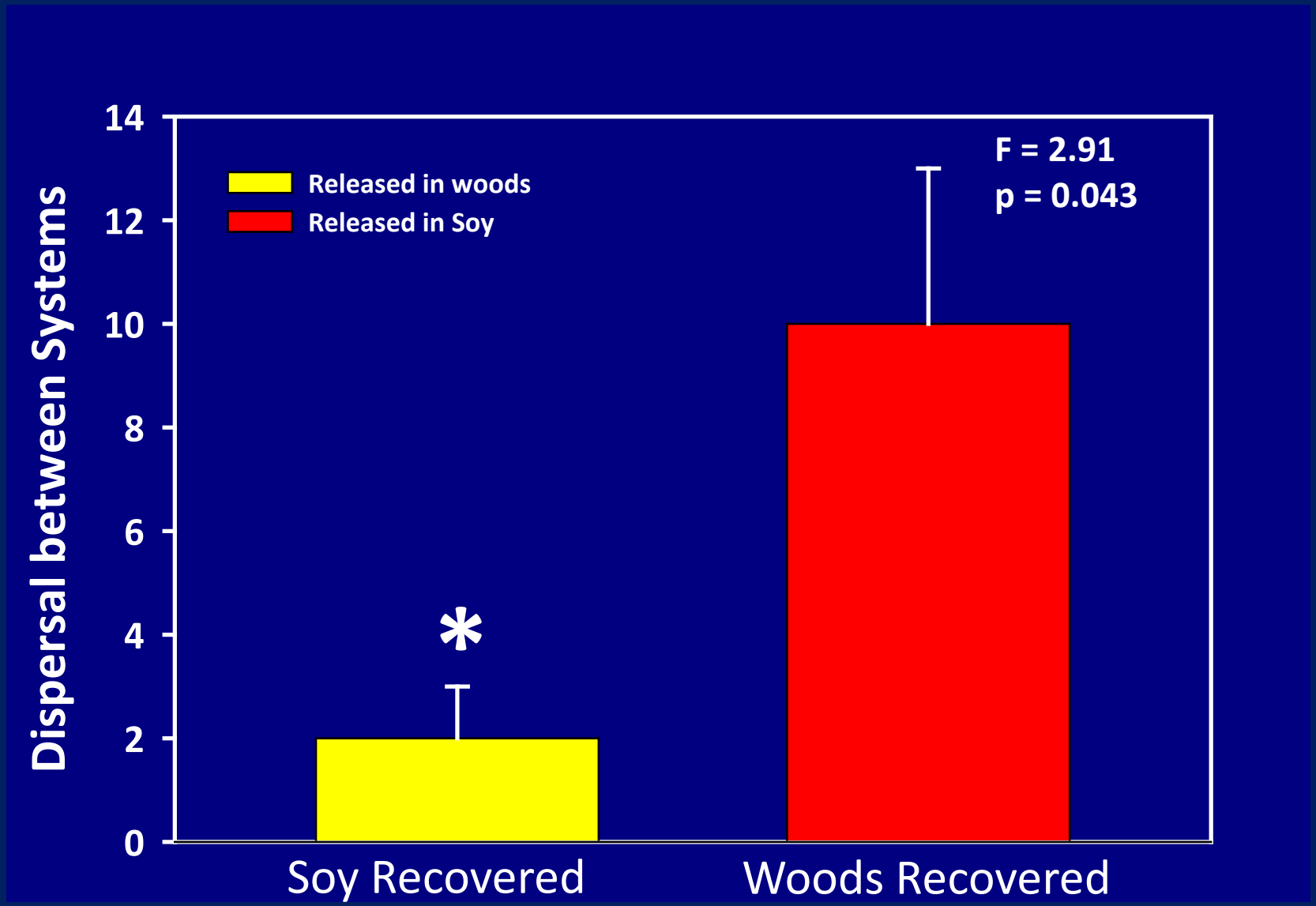


Recovered from Woods

Dispersal Distance



Higher Dispersal from Soy to Woods



Conclusions

- Movement between soybeans and wooded areas does occur but decreases through time
- Significant differences were seen in terms of the distance moved by BMSB depending were they were released
- Significantly more BMSB dispersed from soybeans into wooded areas

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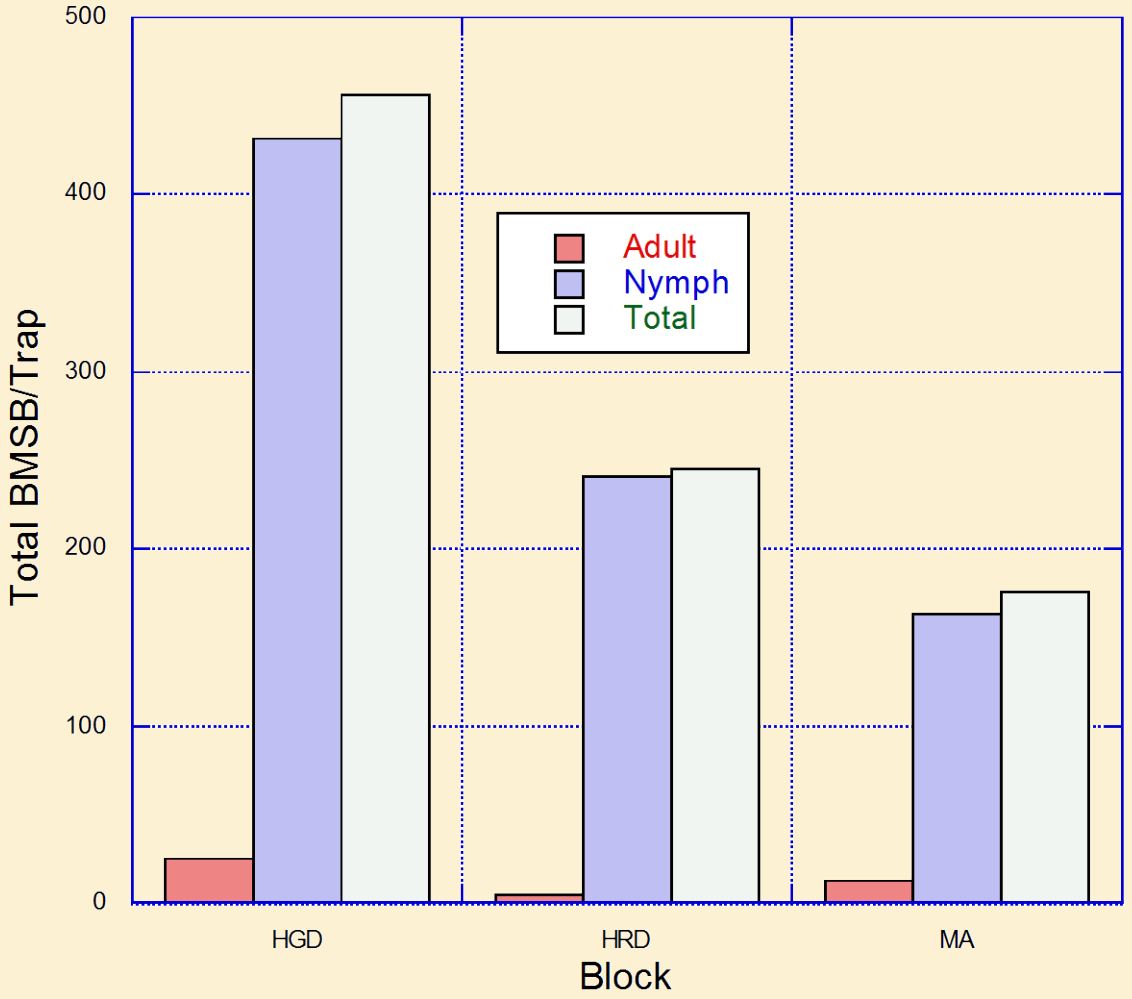
Determining Sampling Method and BMSB Populations in Relation to Wooded Borders

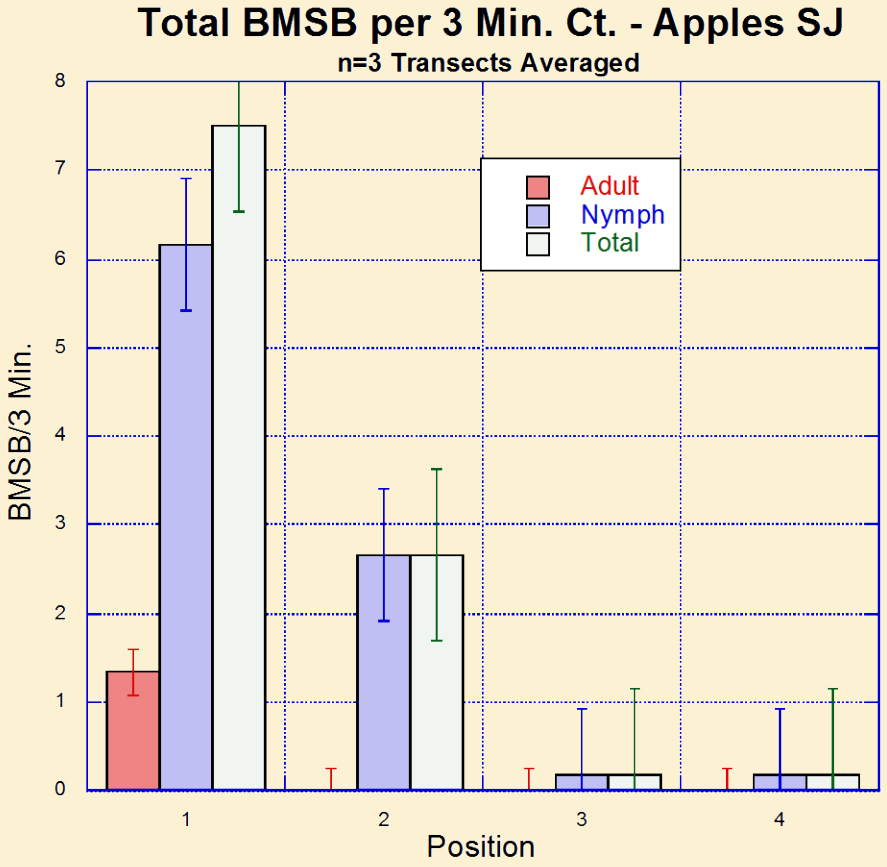
Dean Polk
Rutgers Cooperative Extension

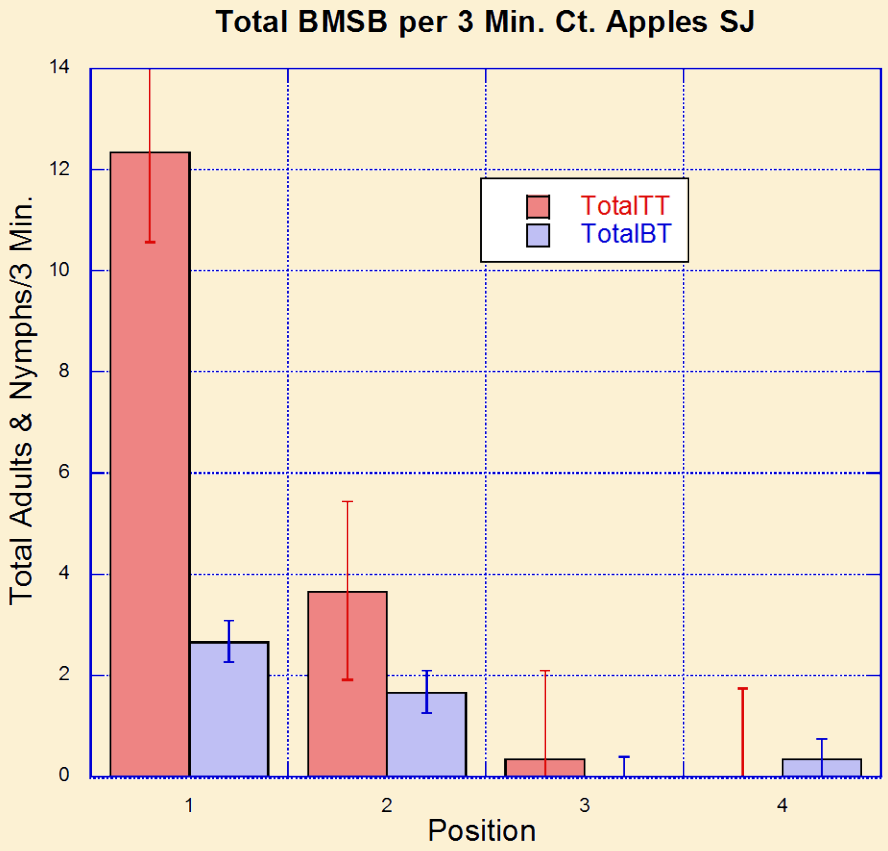
Determining Sampling Method and BMSB Populations in Relation to Wooded Borders

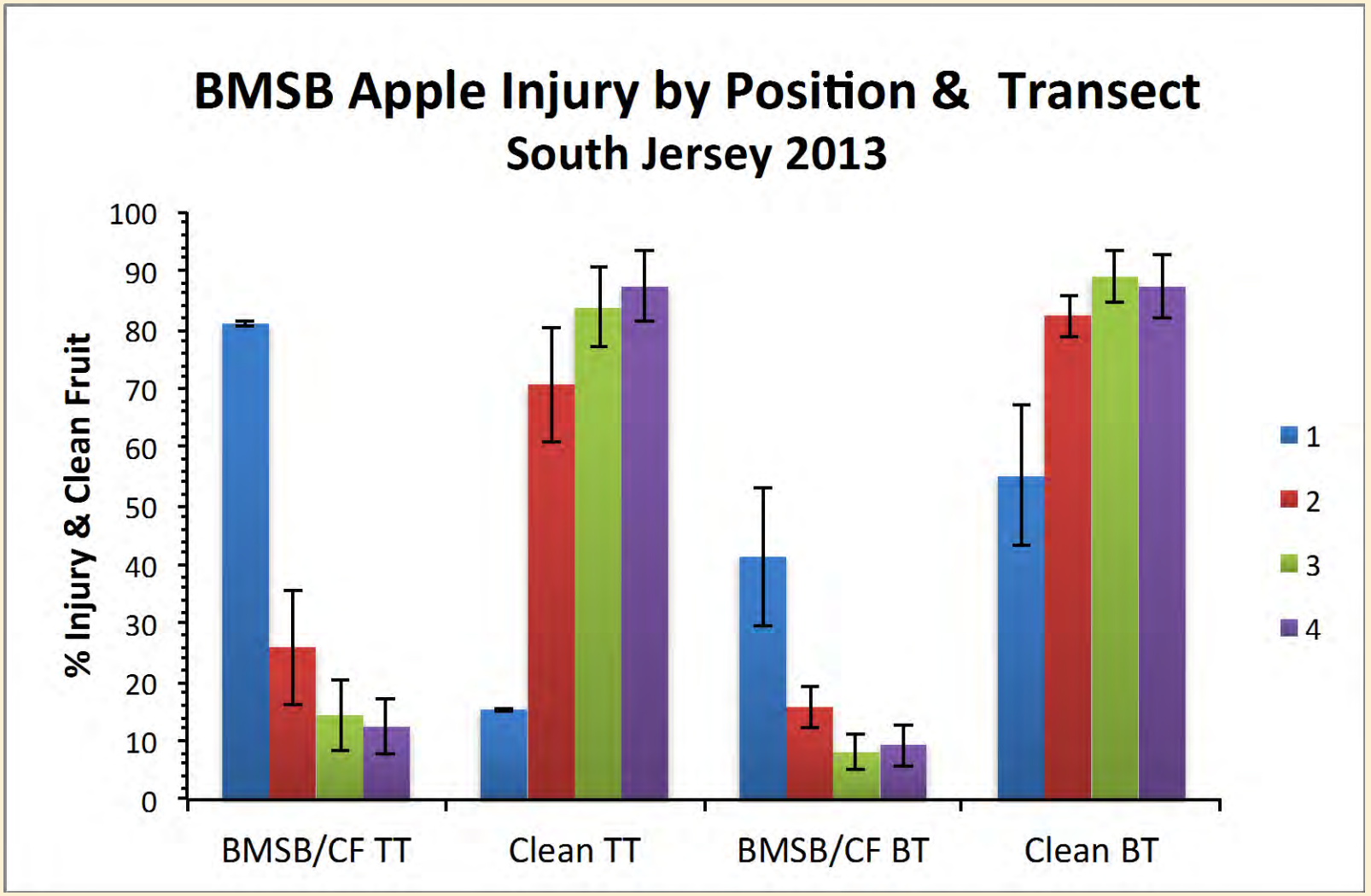
- Transects established in 7 apple orchards and 9 peach orchards
  - Each sampled block done with paired transects
  - Transect with a trap at the first tree by the woods (TT)
  - Transect with no trap (BT)
  - Sampling points placed ~120 feet starting at border.
- Traps: Single ground mounted black pyramid, baited with ARS#20 + ChemTica MDT.
- Data: BMSB/trap, BMSB/3min count at each sampling point, % injured fruit at harvest.
- Following is an example from 3 apple orchards in southern NJ.

BMSB Trap Count Totals 7/12-9/13 Apple SJ




Total BMSB per 3 Min. Ct. - Apples SJ
n=3 Transects Averaged
BMSB/3 Min.
Position
Adult
Nymph
Total
0
1
2
3
4
5
6
7
8
1
2
3
4


Total BMSB per 3 Min. Ct. Apples SJ
Total Adults & Nymphs/3 Min.
Position
TotalTT
TotalBT
0
2
4
6
8
10
12
14
1
2
3
4


BMSB Apple Injury by Position & Transect
South Jersey 2013
% Injury & Clean Fruit
100
90
80
70
60
50
40
30
20
10
0
BMSB/CF TT
Clean TT
BMSB/CF BT
Clean BT
1
2
3
4

Conclusions

- That the traps baited with ARS#20 + ChemTica MDT caught mostly nymphs
- That more BMSB were found at the edges of the field
- That more BMSB were found at orchard borders in tracts containing a trap with decreased amounts in the orchard interior
- That more damage occurred at the border in transects with traps and decreased in the orchard interior