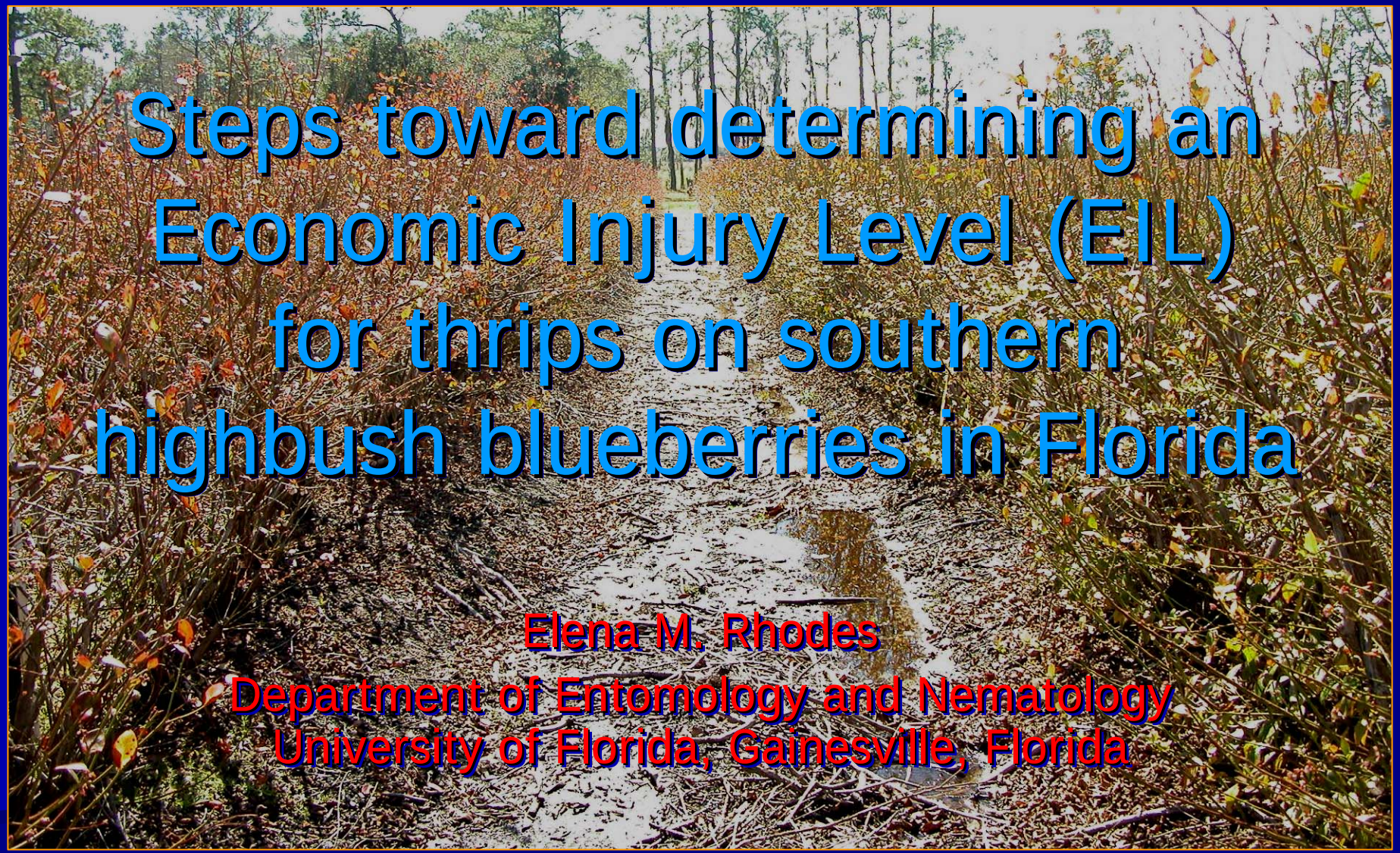

Steps toward determining an Economic Injury Level (EIL) for thrips on southern highbush blueberries in Florida

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Blueberries in Florida

- Rabbiteye (*Vaccinium ashei*)
  - Mainly for U-pick
- Southern Highbush (*V. corymbosum* x several FL species)
  - fresh market blueberries
  - 2006 (USDA, 2007)
    - 7 million lbs
    - 2,600 acres
    - Average of $4.70 per lb

Flower Thrips

- ~ 90% of thrips captured in FL blueberries are *Frankliniella bispinosa* (Morgan) (Arevalo, 2006)
- ~ 1 mm in length
- Bristle-like wings and “punch and suck” mouthparts
- Wide host range

Thrips Injury

- Thrips injure flowers in two ways
  - Feeding

  - Oviposition

Thrips Control

- Conventional and Reduced-risk insecticides
  - Malathion®
  - SpinTor®
- Economic Threshold has not been determined

Objectives

- Investigate varietal susceptibility in southern highbush blueberries (SHB)
- Quantify the relationship between thrips numbers and fruit injury in SHB
- Quantify the relationship between thrips per trap and thrips per flower in SHB

Methods

- 2 farms in Hernando Co. , Florida
- 4 varieties of SHB: Emerald, Jewel, Millennia, Windsor
  - 9 plants from each variety
- Completely randomized design

Sampling Methods

- White sticky traps
  - A total of 36 sticky traps per farm were used and changed out weekly

- Flower Samples
  - Five flowers were collected weekly from the plant closest to each sticky trap
  - Gently dissected

Fruit Injury Assessment

- 25 fruits were collected from four plants adjacent to the sticky trap
  - 100 per plant, 900 per variety on each farm
- Examined for injury and marketability

Objectives

- Investigate varietal susceptibility in southern highbush blueberries (SHB)

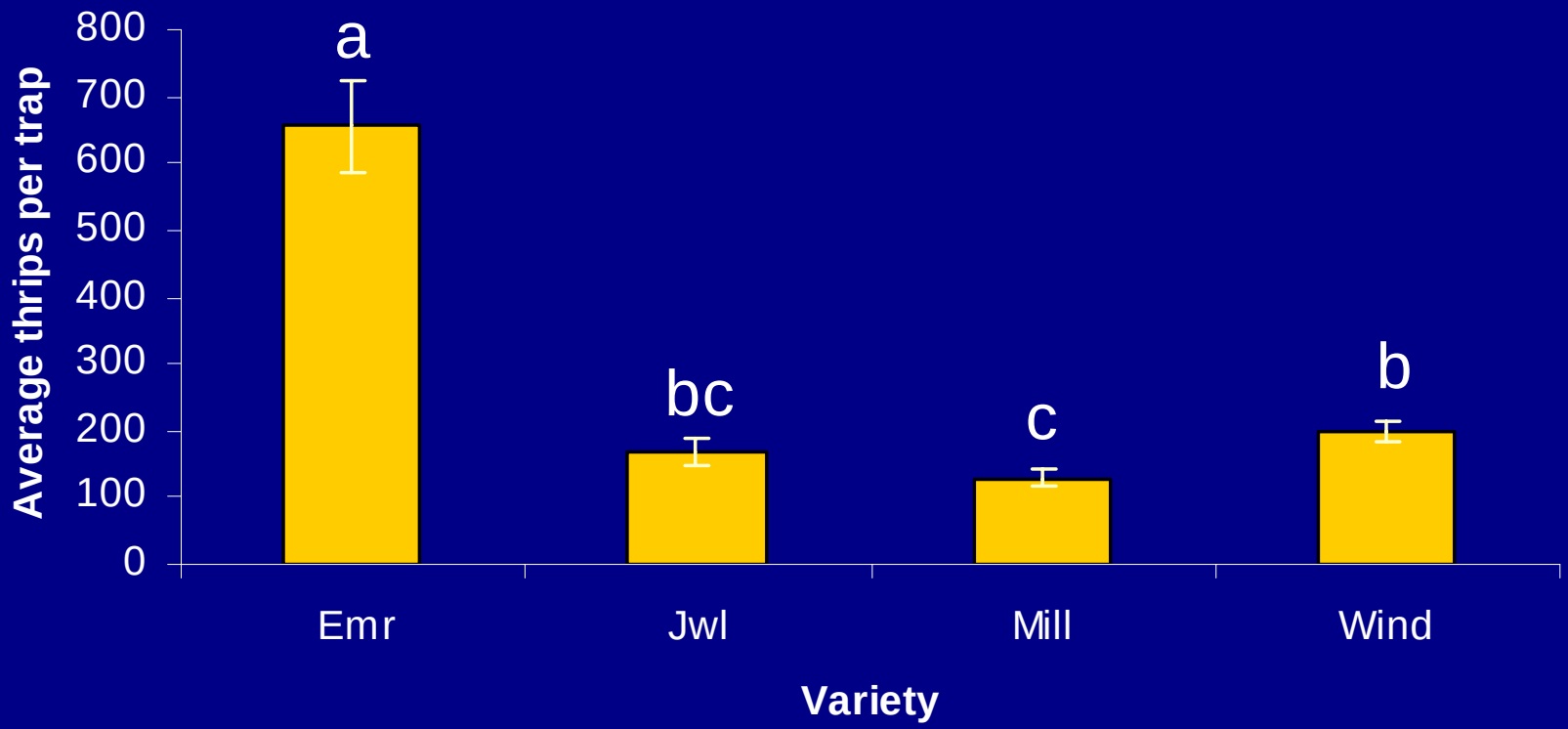
Hypothesis

- Different varieties with varying characteristics will attract different numbers of thrips, which will cause different levels of injury

Statistics

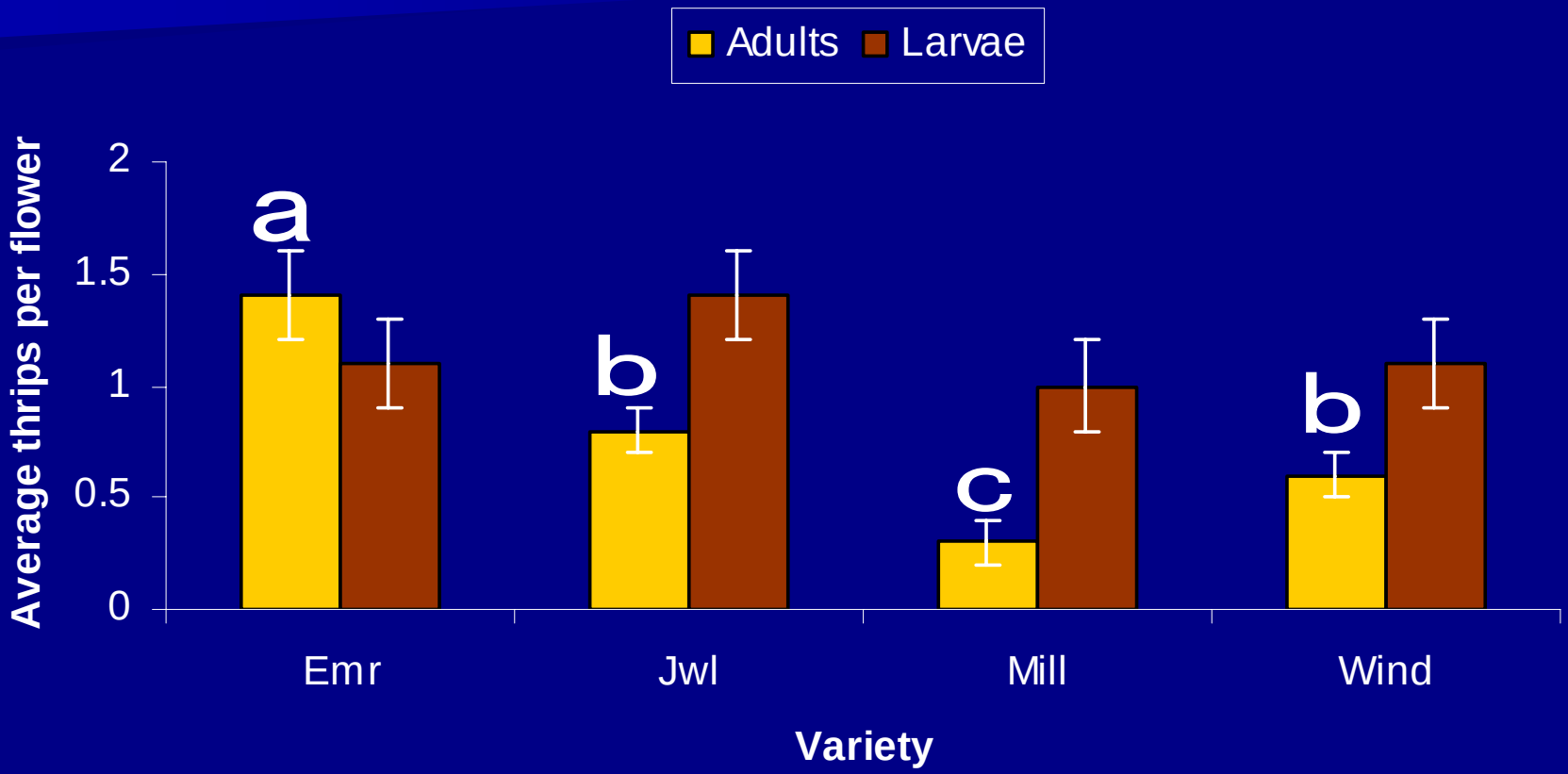
- Thrips population
  - Transformed to comply with assumptions
    - Sticky trap data $\log_{10}$ transformed
    - Flower data 1/(sqrt(1 + thrips)) transformed
  - Compared among varieties with ANOVA
  - Means separated using LSD
- Fruit Injury
  - Transformed to comply with assumptions
    - $\log_{10}$ (injury + 1) transformed
  - Compared among varieties with ANOVA
  - Means separated using LSD

Farm 1: Thrips per Trap



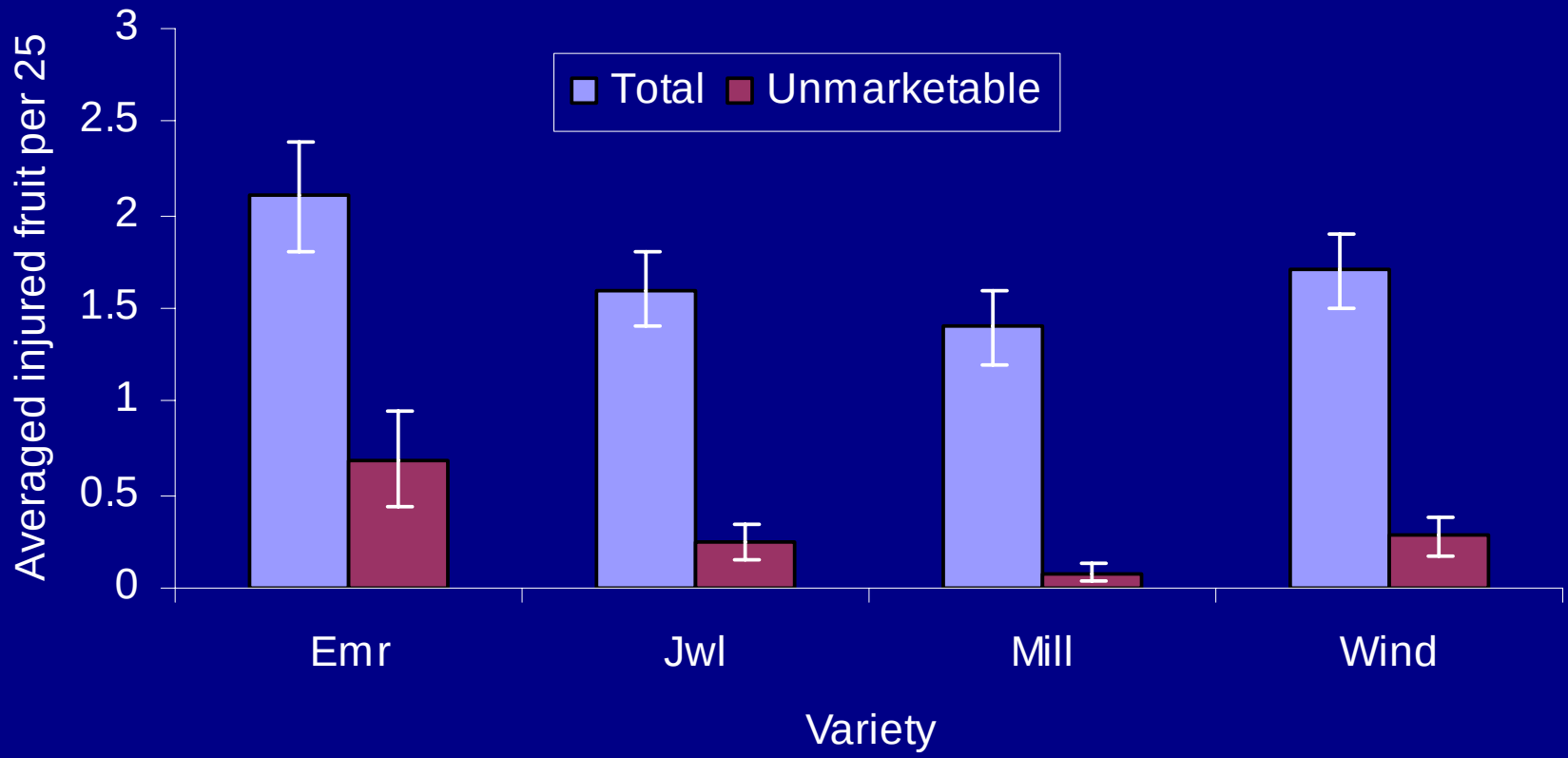
$P < 0.0001$

Farm 1: Thrips per Flower



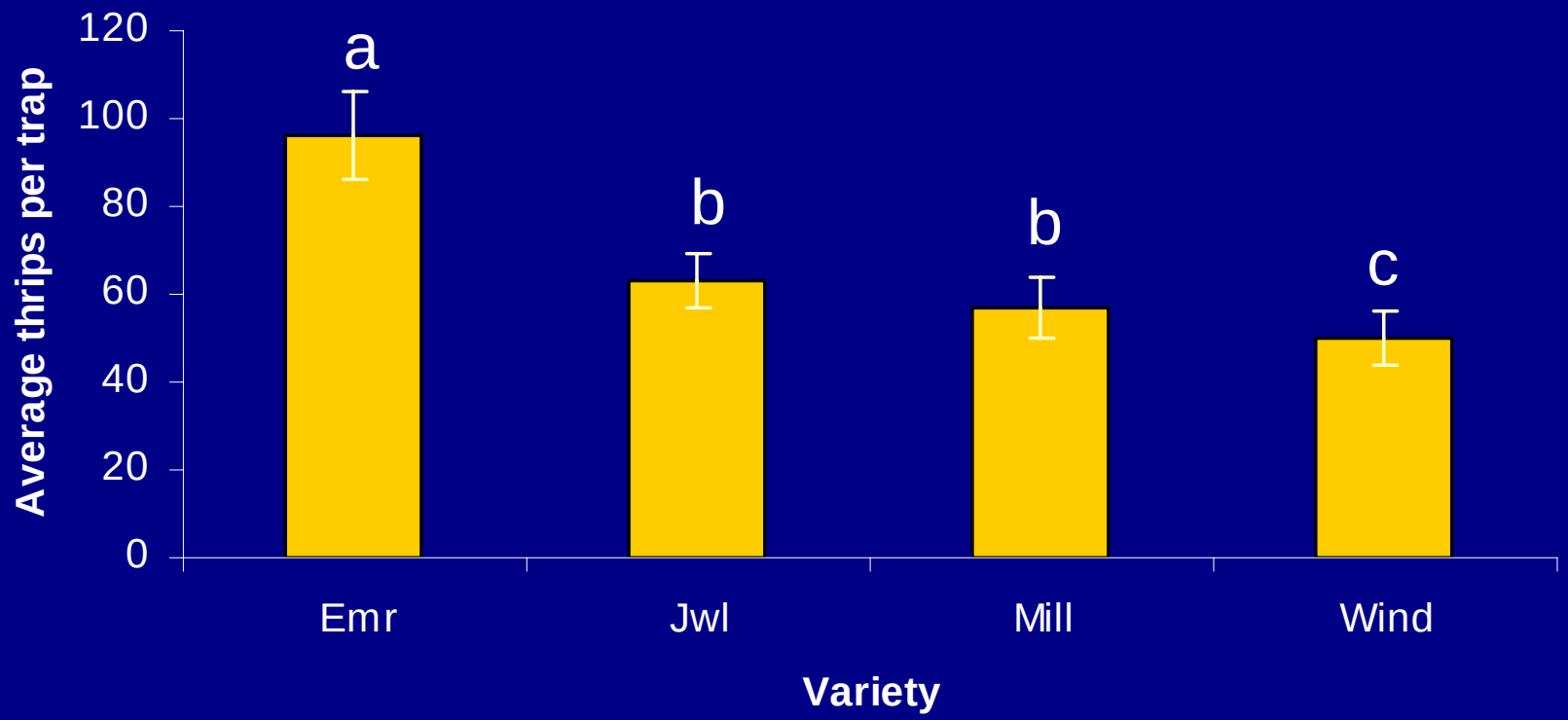
Adults: $P < 0.0001$
Larvae: $P = 0.69$

Farm 1: Fruit Injury



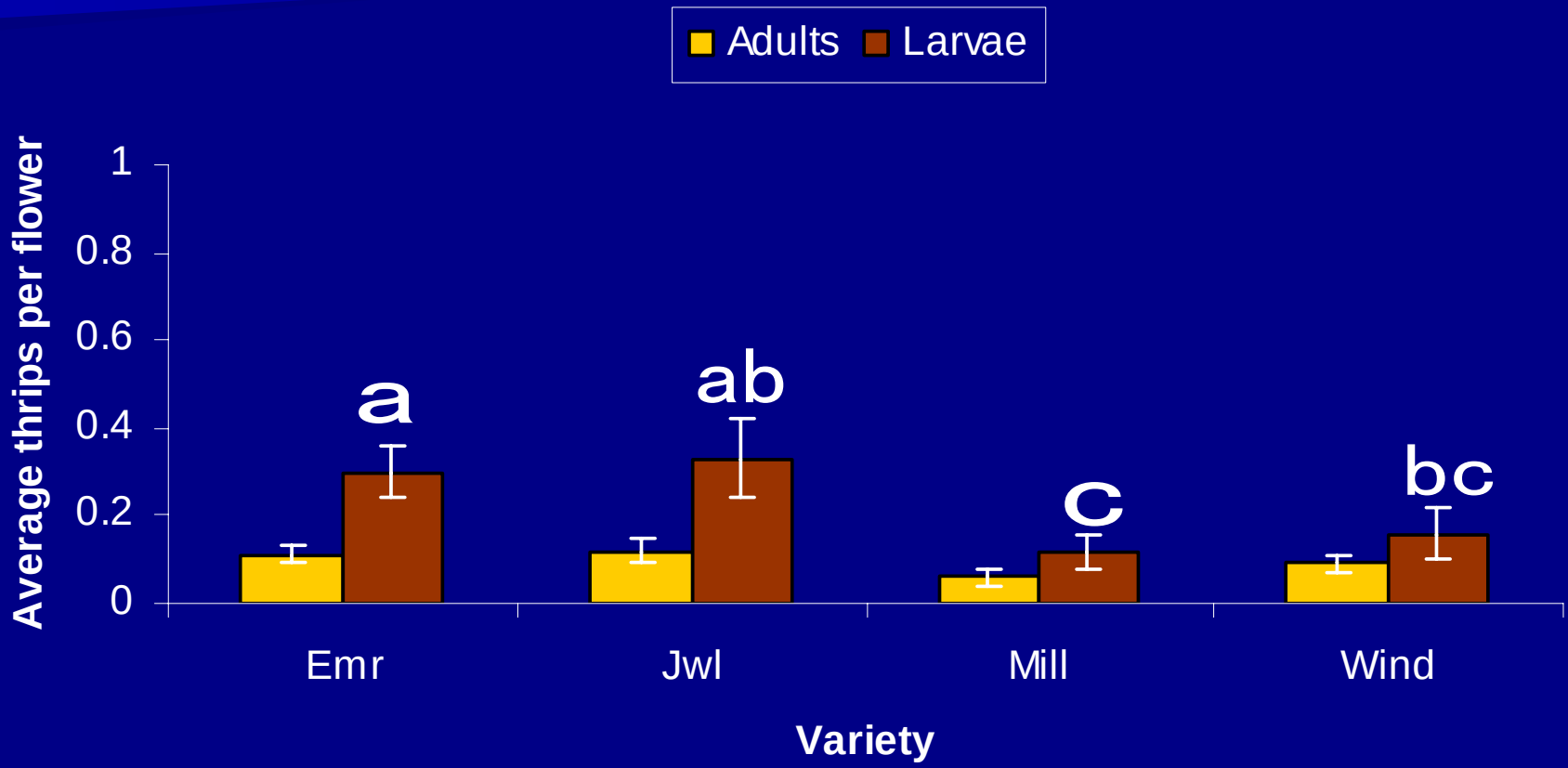
Injured: $P = 0.25$
Unmarketable: $P = 0.31$

Farm 2: Thrips per Trap



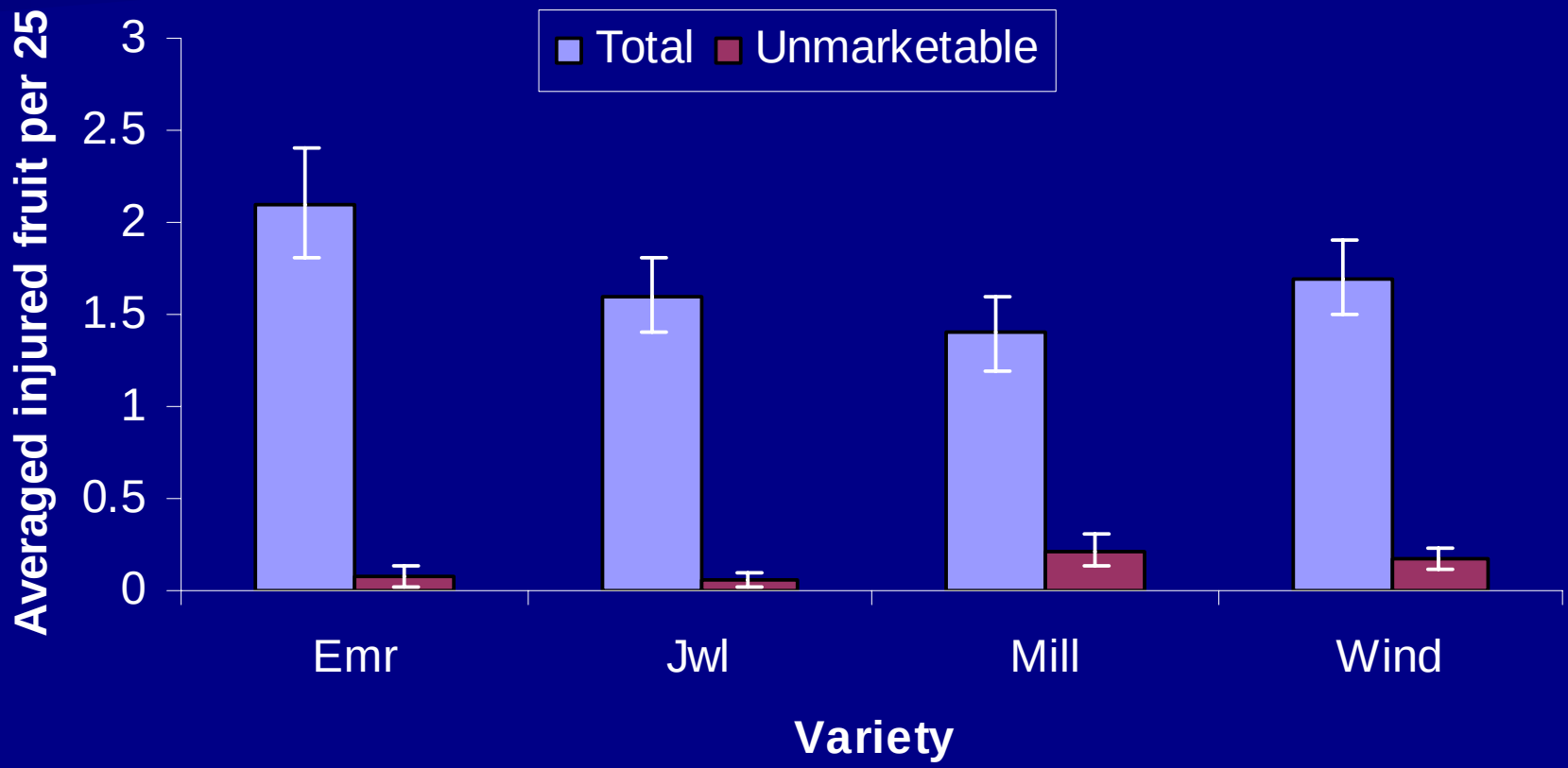
$P < 0.0001$

Farm 2: Thrips per Flower



Adults: $P = 0.24$
Larvae $P = 0.02$

Farm 2: Fruit Injury



Injured: $P = 0.83$
Unmarketable: $P = 0.15$

Objectives

- Investigate varietal susceptibility in southern highbush blueberries (SHB)

- Quantify the relationship between thrips numbers and fruit injury in SHB

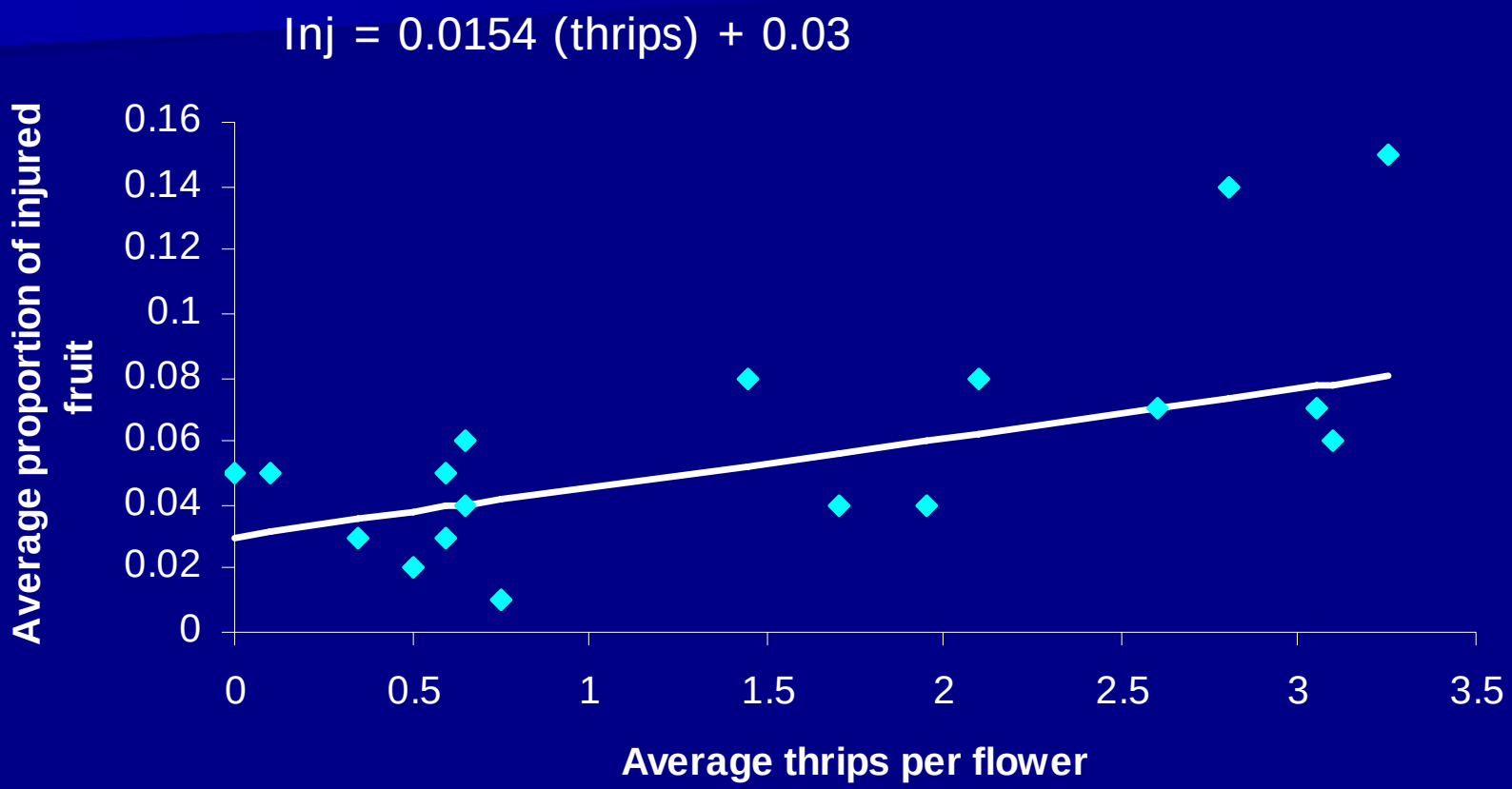
Hypothesis

-There is a positive linear relationship and correlation between thrips per flower and fruit injury

Thrips per flower vs. proportion of injured fruit

- Nonparametric Regression
  - Theil statistic C
    - Slope
  - Spearman correlation statistic r_s

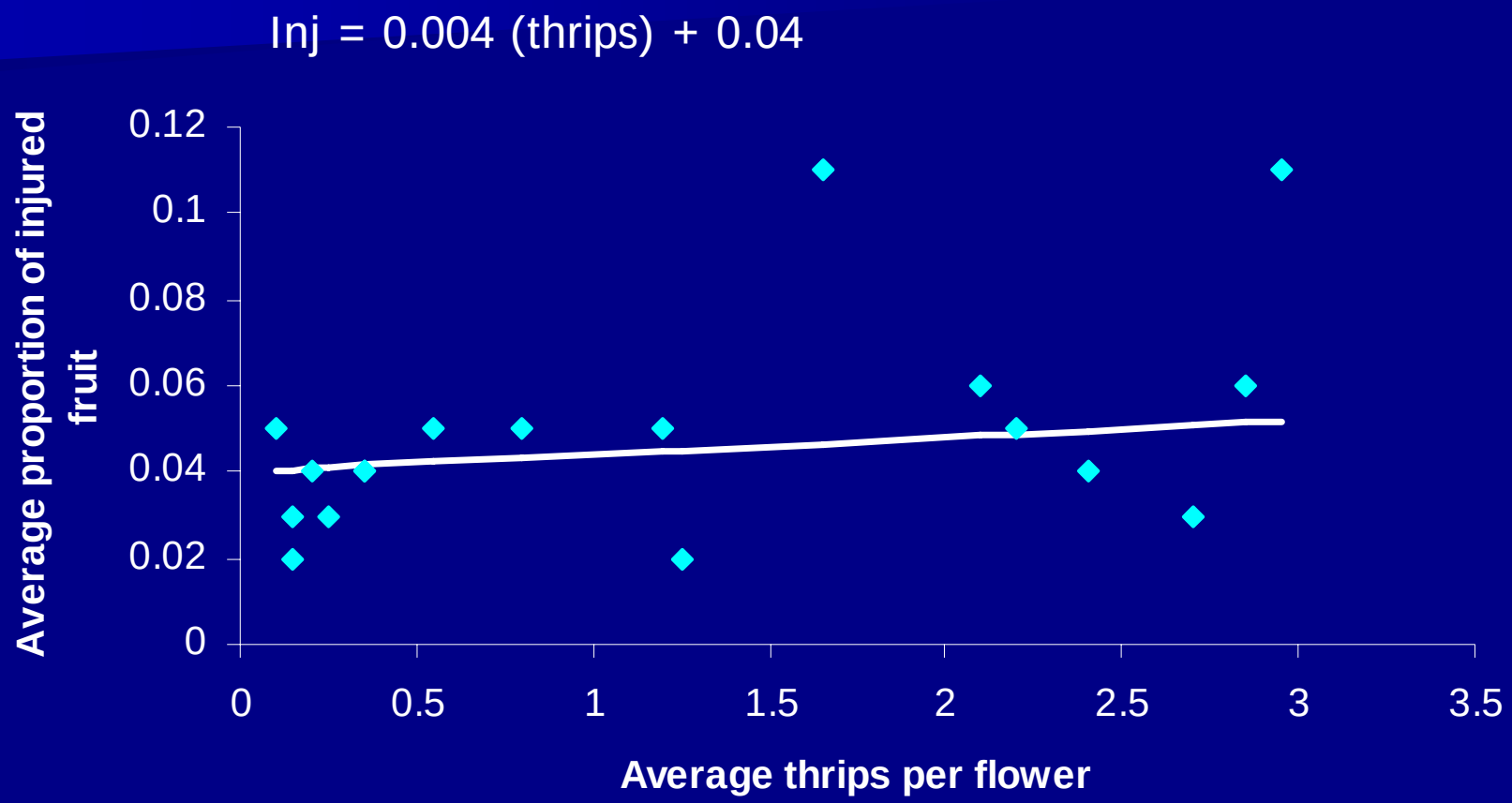
Emerald Variety



C = 63, P = 0.009

R_s = 0.63, 0.005 > P > 0.0025

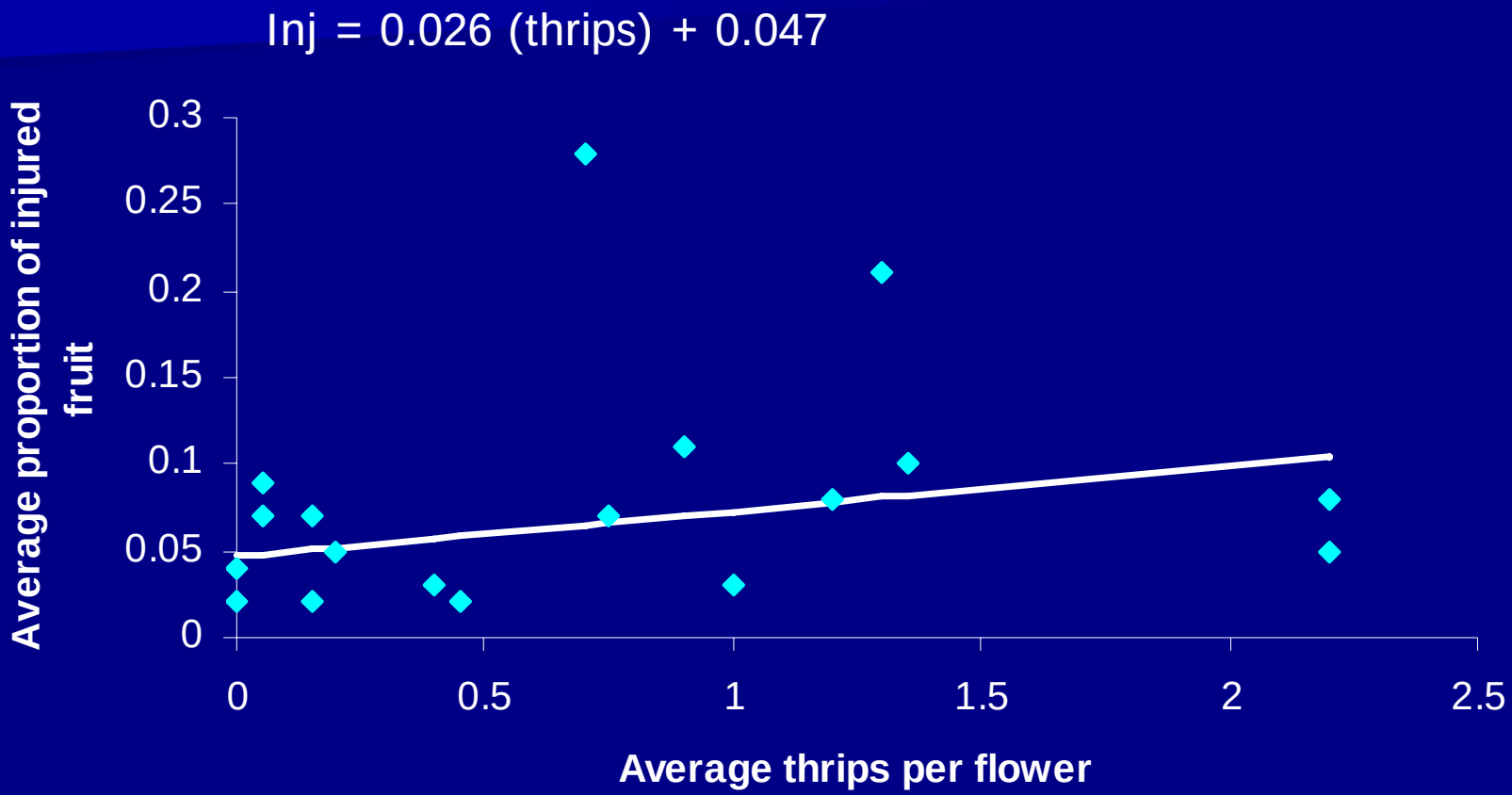
Jewel Variety



C = 54, P = 0.024

R_s = 0.48, 0.05 > P > 0.025

Millennia Variety

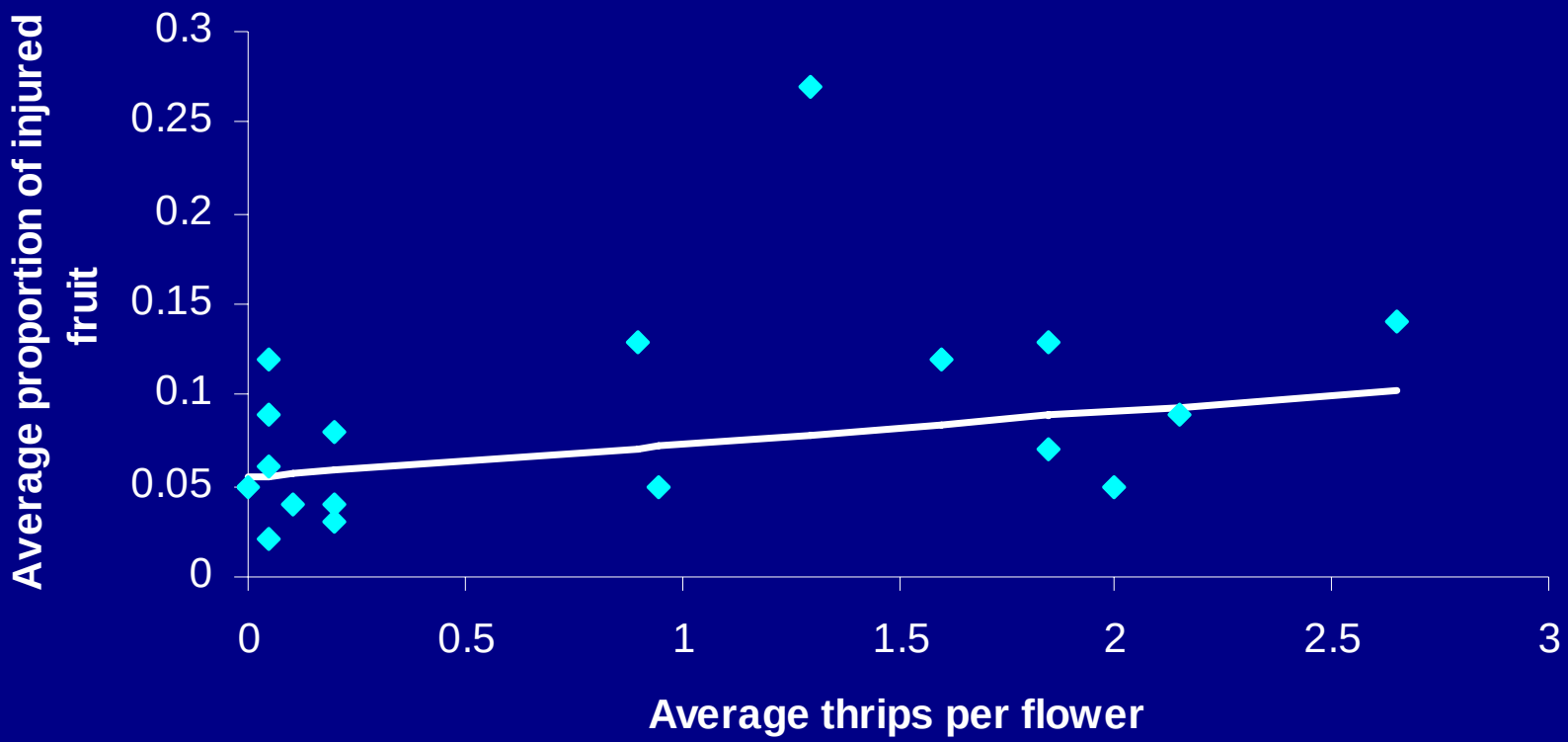


C = 39, $P = 0.076$

$R_s = 0.43$, $0.05 > P > 0.025$

Windsor Variety

Inj = 0.018 (thrips) + 0.055



C = 45.5, P = 0.048

R_s = 0.45, 0.05 > P > 0.025

Objectives

Hypothesis

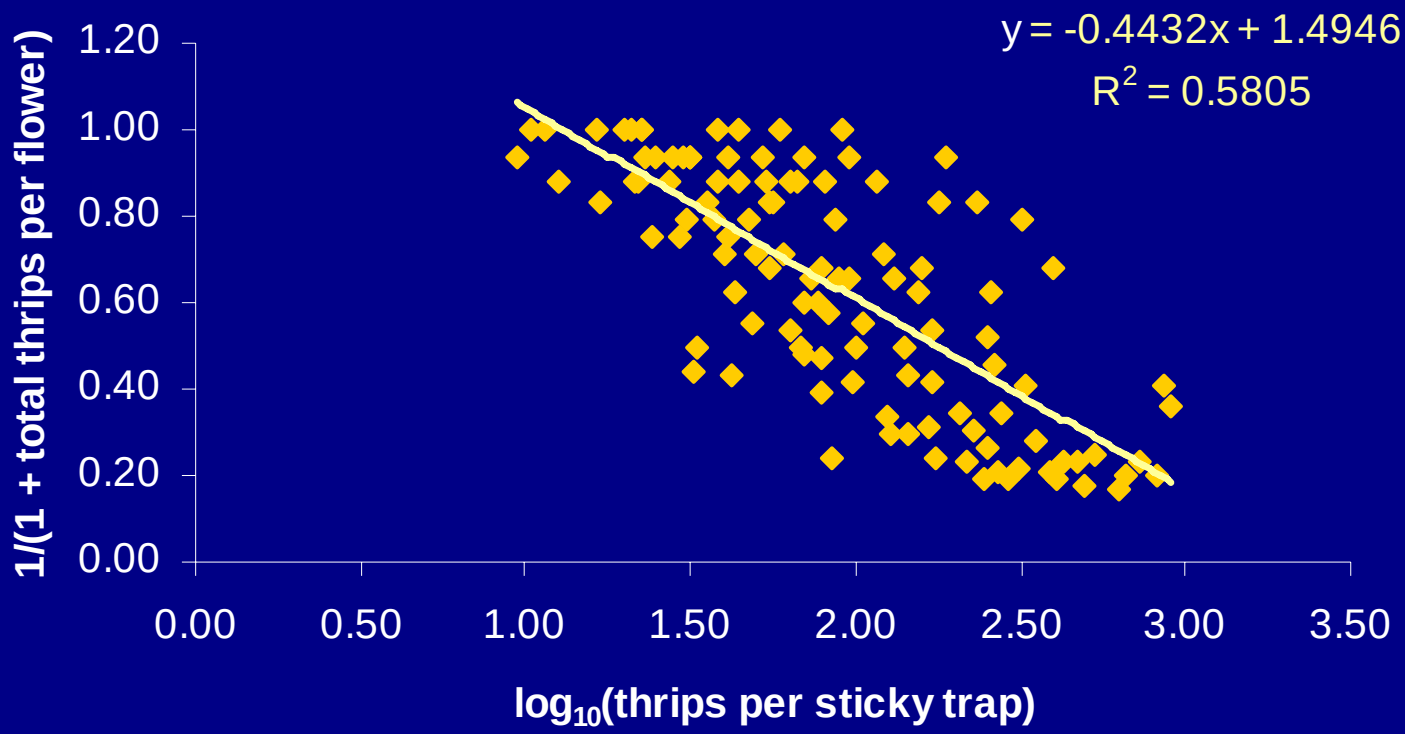
-There is a positive linear relationship between thrips per trap and thrips per flower

- Quantify the relationship between thrips per trap and thrips per flower in SHB

Thrips per trap vs. thrips per flower

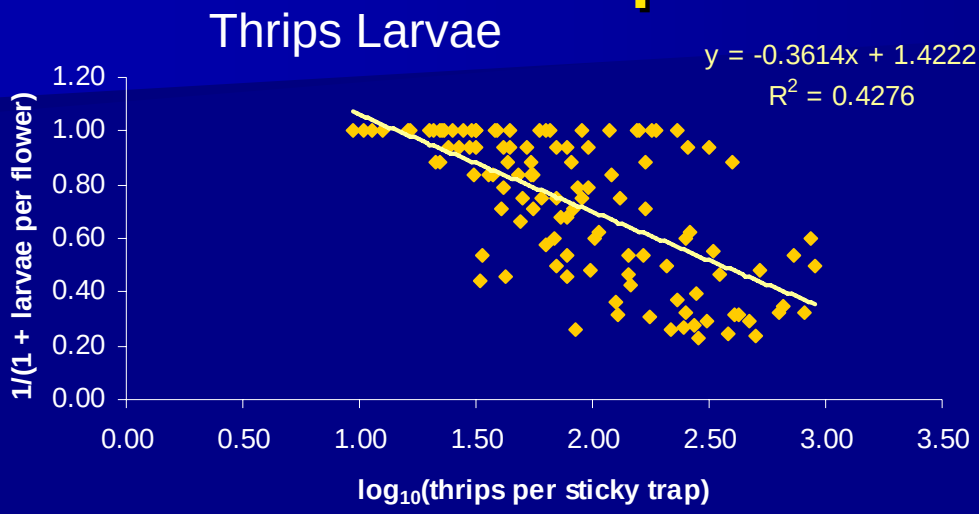
- Simple Linear Regression
  Log_{10}(thrips per sticky trap) vs. 1/(total thrips per flower + 1)

Thrips per Sticky Trap vs. Thrips per Flower

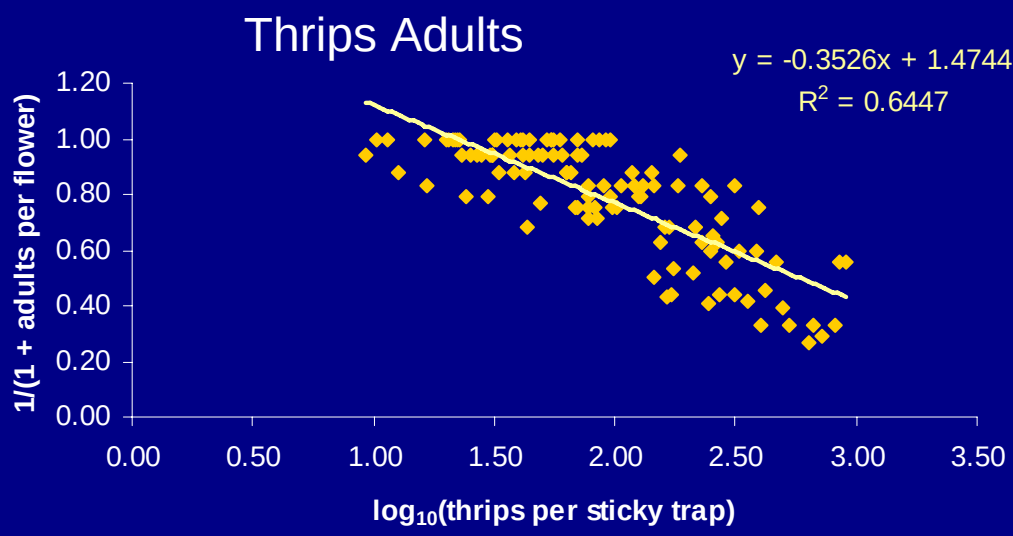


$P < 0.0001$

Thrips per Sticky Trap vs. Thrips per Flower



P < 0.0001



P < 0.0001

Summary

- Significantly more thrips per trap were colleted from the Emerald variety, but there was no consistent trend in either thrips larvae or adults per flower among varieties
- There were no significant differences in numbers of injured or unmarketable fruit
- There was a positive linear relationship and correlation between thrips per flower and fruit injury in all four varieties
- There is a moderately strong linear relationship between $\log_{10}$(thrips per trap) and 1/sqrt(thrips per flower)

Acknowledgements

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