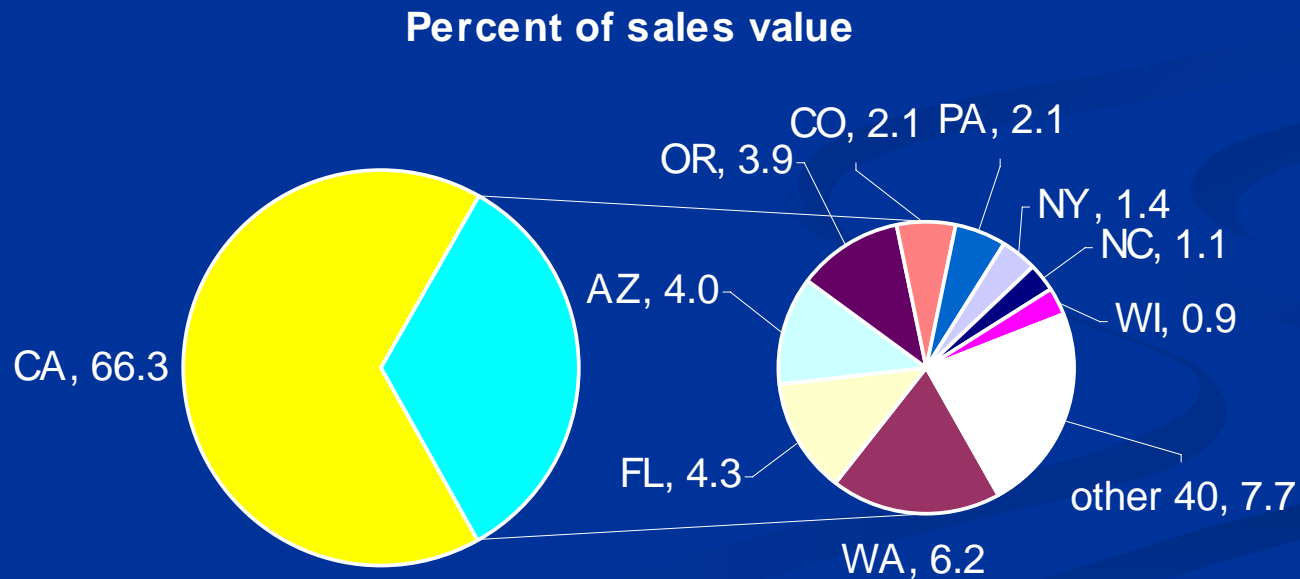


**Trap cropping for
management of the yellow
margined leaf beetle
(*Microtheca ochroloma* Stål)
in organic cruciferous crops**

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Organic Vegetable Production

- Growing industry in the US
 - 2008: 3,948 farms, 132,776 acres, \$689,991,920 sales value



Yellow Margined Leaf Beetle

5.6 d



Longevity: 16 – 186 d
Fecundity: 200
or more eggs



13 d
(3 – 4 instars
+ prepupa)



7.8 d

Host preference

- Cruciferae
 - Broccoli, cabbage, cauliflower, collards, mustard, radish, turnip, and watercress
 - Turnip most preferred
 - Also Japanese greens (mizuna and mibuna) and napa cabbage



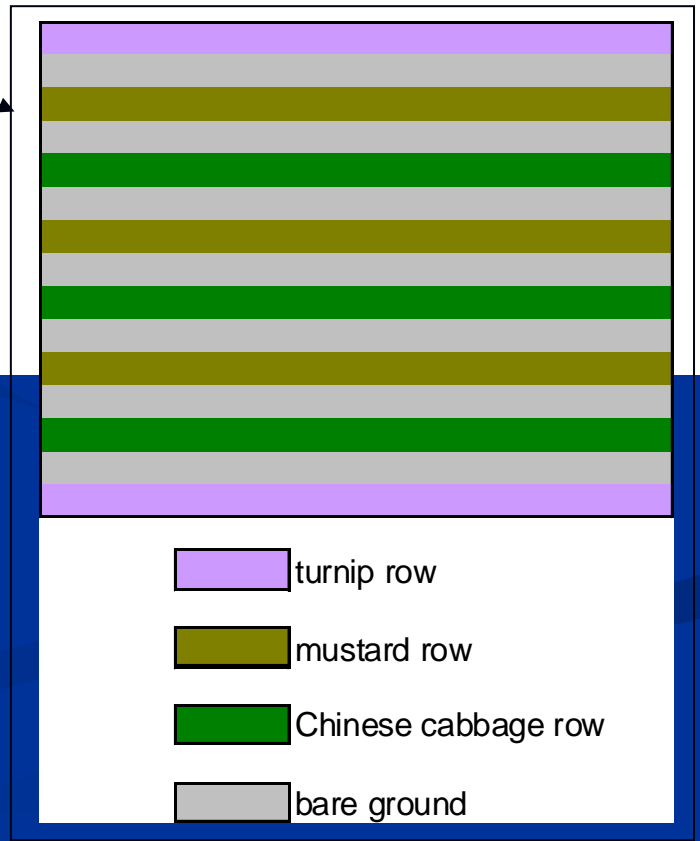
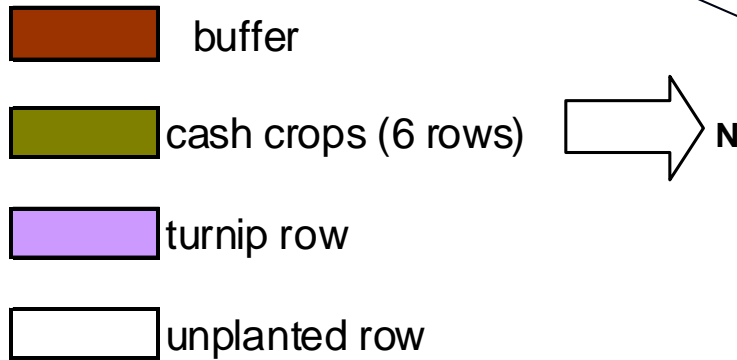
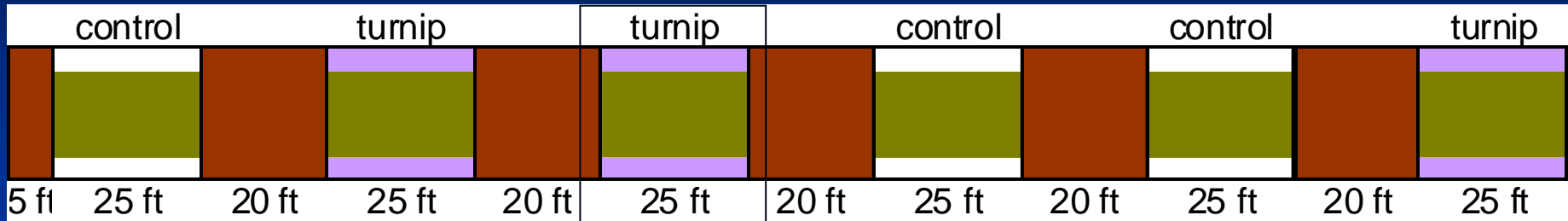
Management

- Insecticides
 - Entrust[®] (spinosad), Pyganic[®] (pyrethrum)
 - Rotations: Pyganic[®] /Entrust[®] and NOFLY[™]/Entrust[®]
- Few known natural enemies
 - *Stiretrus decastigmus* (Herrich-Schaeffer) in Brazil (Pentatomidae)
 - Spined soldier bug, *Podisus maculiventris* (Say), in laboratory assays (Pentatomidae)

Objectives

- To examine the potential of turnip as a trap crop for the YMLB in organically grown cruciferous crops
- To survey for natural enemies of the YMLB

Methods



Methods: YMLB Counts

- Randomly selected 10 plants from each cash crop per plot
- Counted all YMLB adults and larvae
- Weekly samples from 6 March to 1 May
- Repeated measures analysis

Methods: Harvest Evaluation

- 10 plants from each cash crop per plot
- Rating scale
 - 1 very light (0 – 10%) defoliation
 - 2 light (10 – 30%)
 - 3 moderate (30 – 50%)
 - 4 heavy (50 – 70%)
 - 5 very heavy (70 – 90%)
 - 6 complete (90 – 100%)

Injury Rating



1



2



Injury Rating



3



4



Injury Rating



5



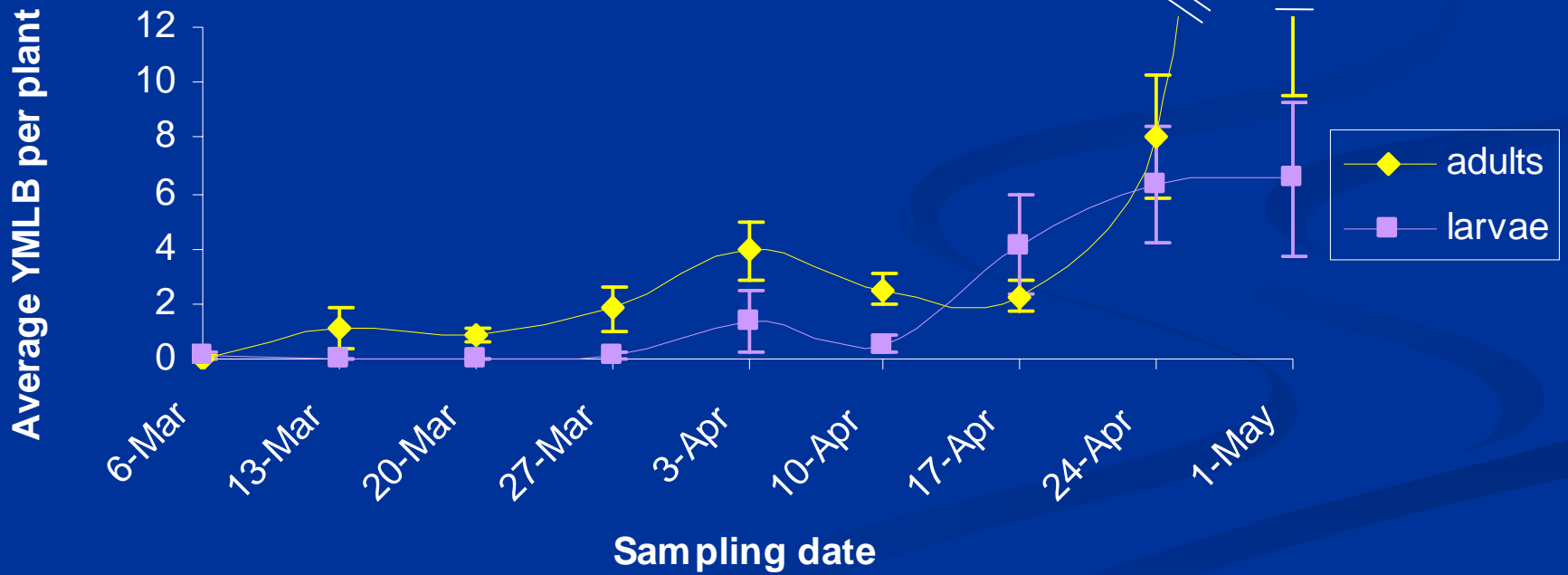
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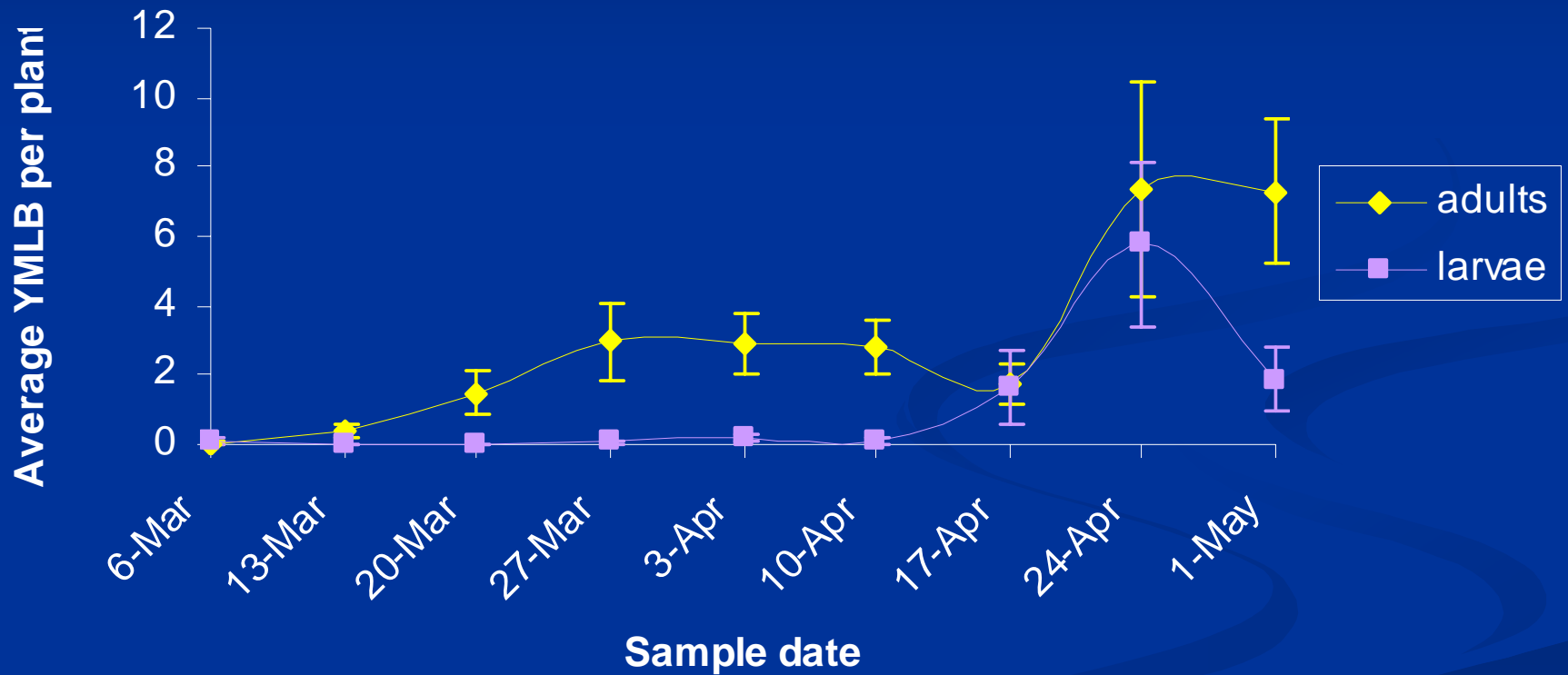
Methods: Natural Enemies

- Recorded all natural enemies seen during YMLB sampling
- Collected specimens for ID

Results: mustard

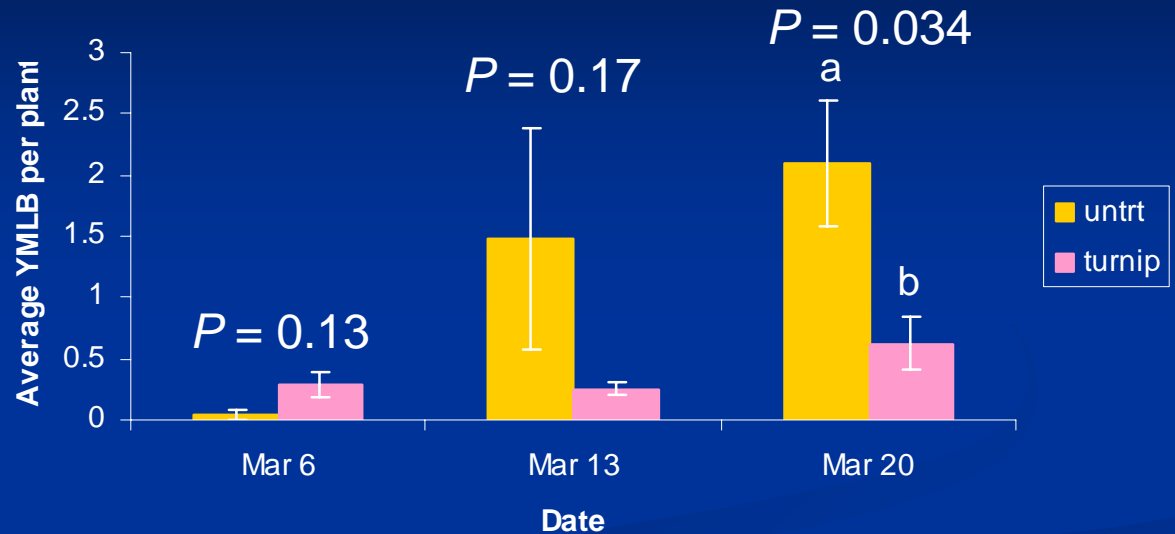


Results: napa cabbage



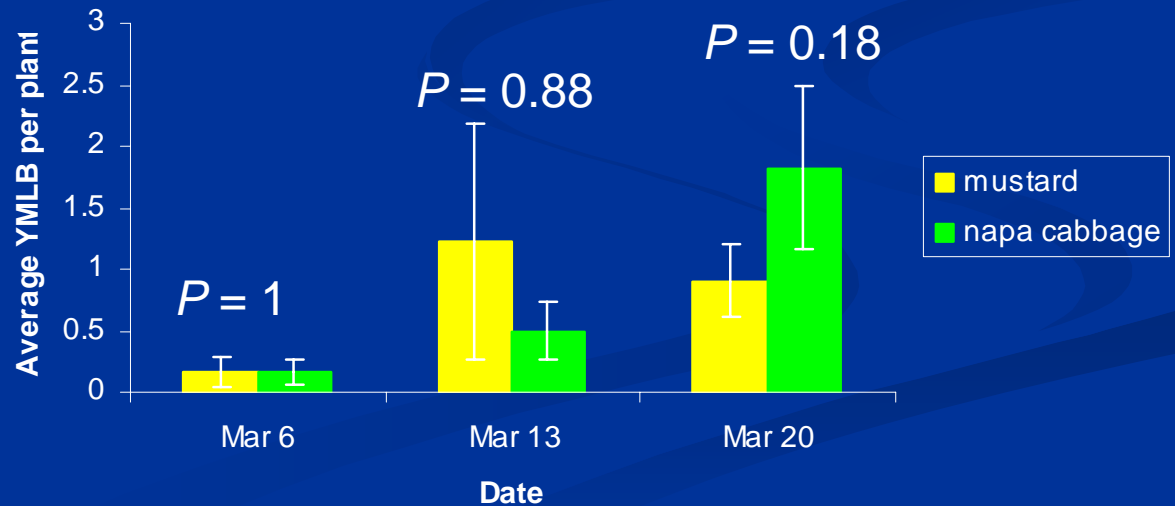
Results: YMLB numbers

Treatment



Treatment*Crop
all $P > 0.4$

Crop

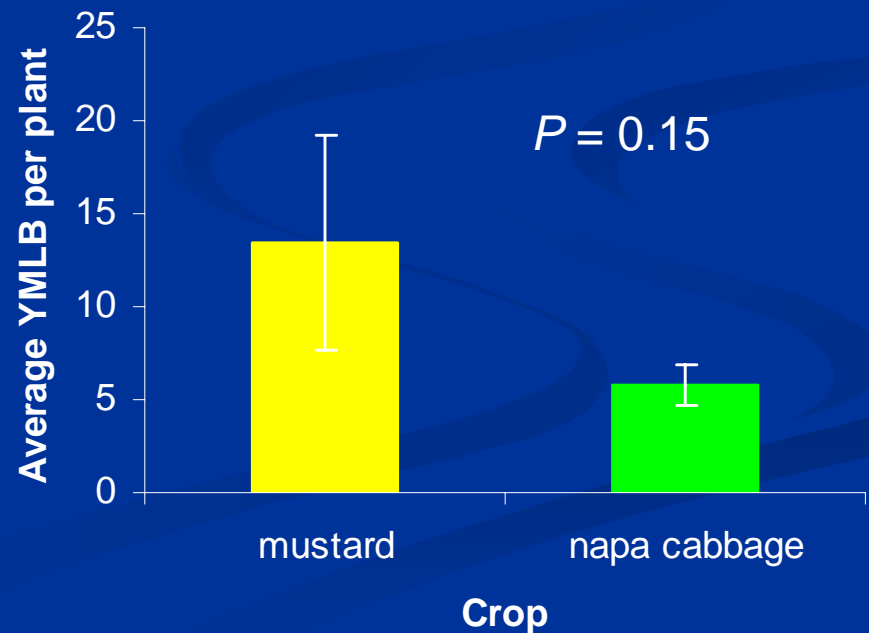
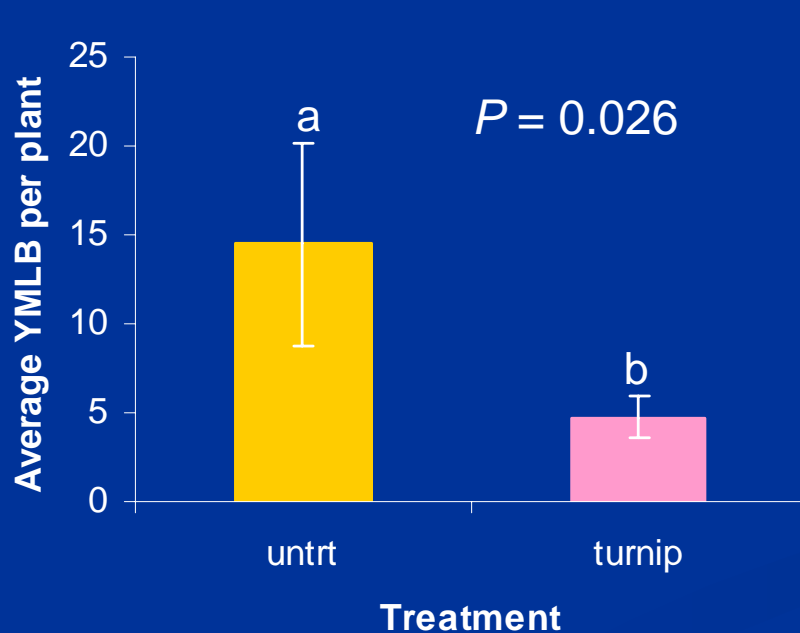


Results: YMLB numbers

27 Mar to 1 May

Interaction with time: all $P > 0.07$

Treatment*Crop $P = 0.93$



Results: harvest evaluation

Treatment*Crop $P = 0.76$

Treatment

Untreated: 3.9 ± 0.3

Turnip: 2.3 ± 0.1

$P = 0.0005$

Crop

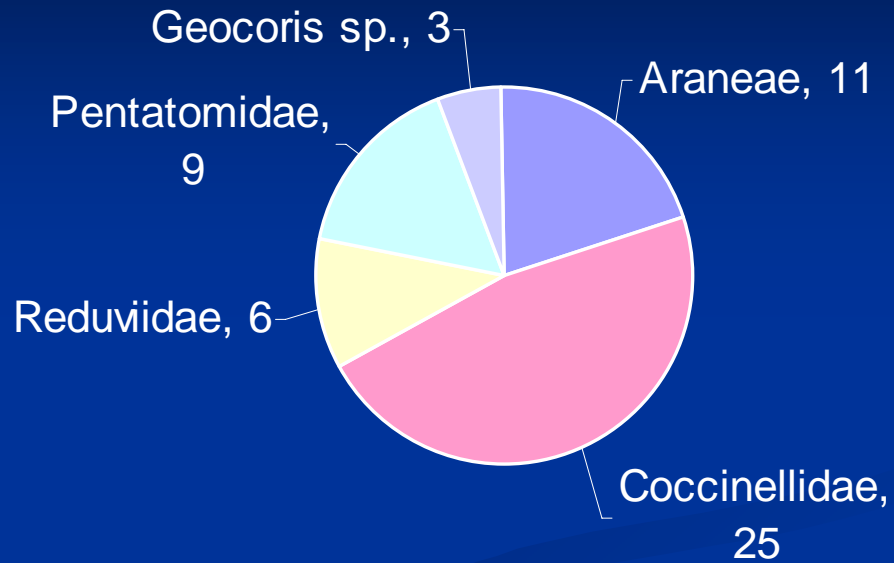
Mustard: 3.4 ± 0.4

Napa cabbage: 2.7 ± 0.4

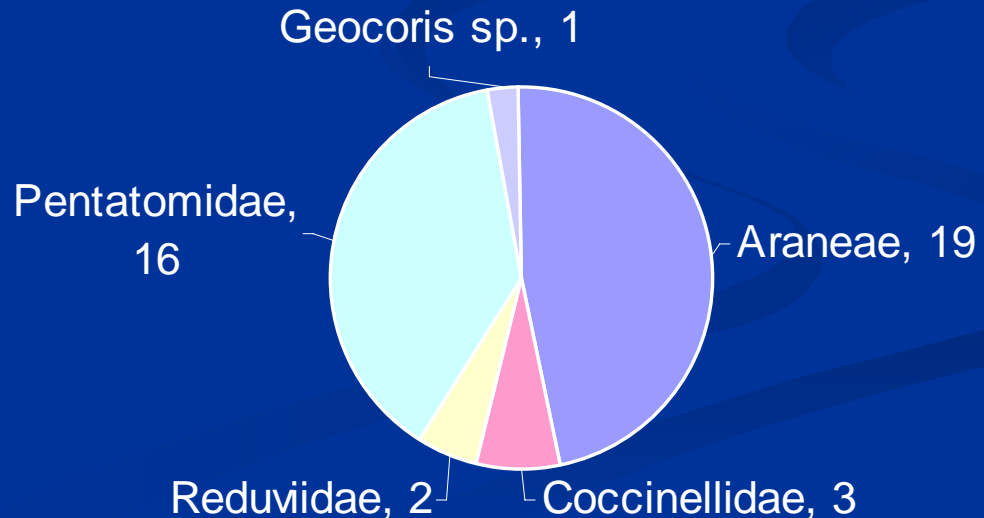
$P = 0.025$

Results: natural enemies

mustard



napa cabbage



Results: natural enemies



Stiretrus anchorago (Fabricius)
Anchor stink bug

Results: natural enemies



P. maculiventris
Spined soldier bug

Discussion

- Turnip appears to be an effective trap crop despite:
 - Late start
 - Late freeze
 - Replanting
- Two species of predatory Pentatomidae observed feeding on YMLB

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