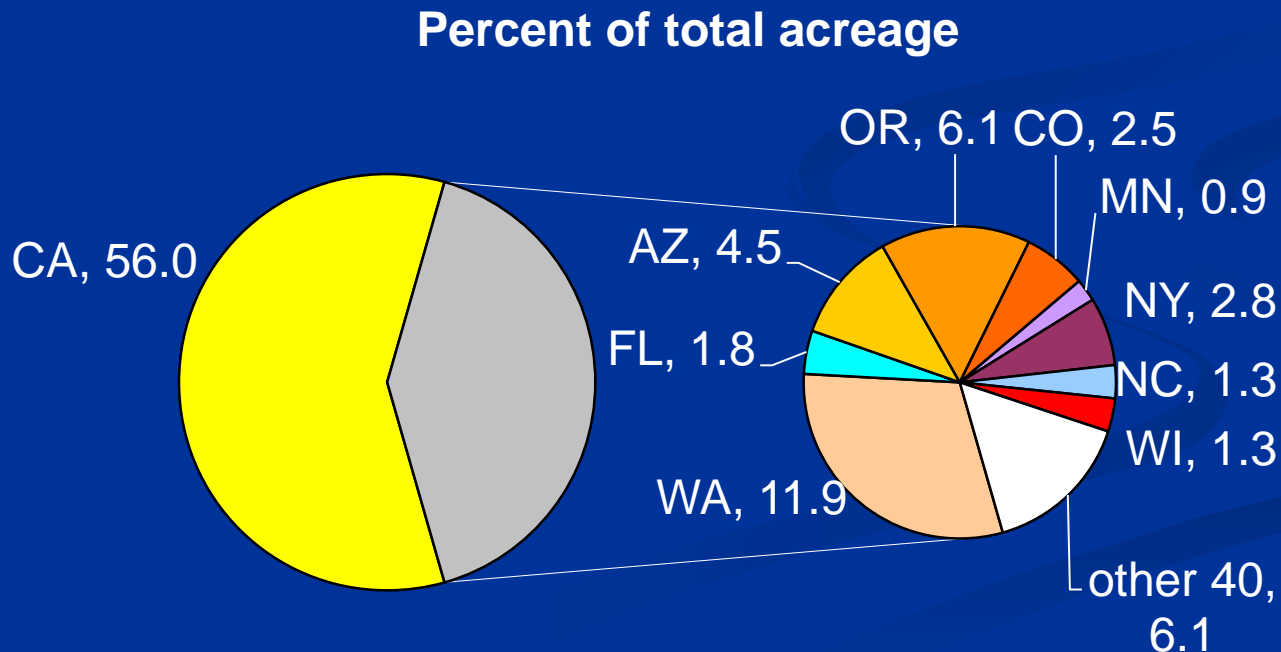


**Managing yellow margined
leaf beetle (*Microtheca
ochroloma* Stål) in organic
cole crops with trap
cropping**

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Organic Vegetable Production

- Growing industry in the US
 - 2011: 1,956 farms, 118,071 acres, sales value \$1,065,715,970



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)

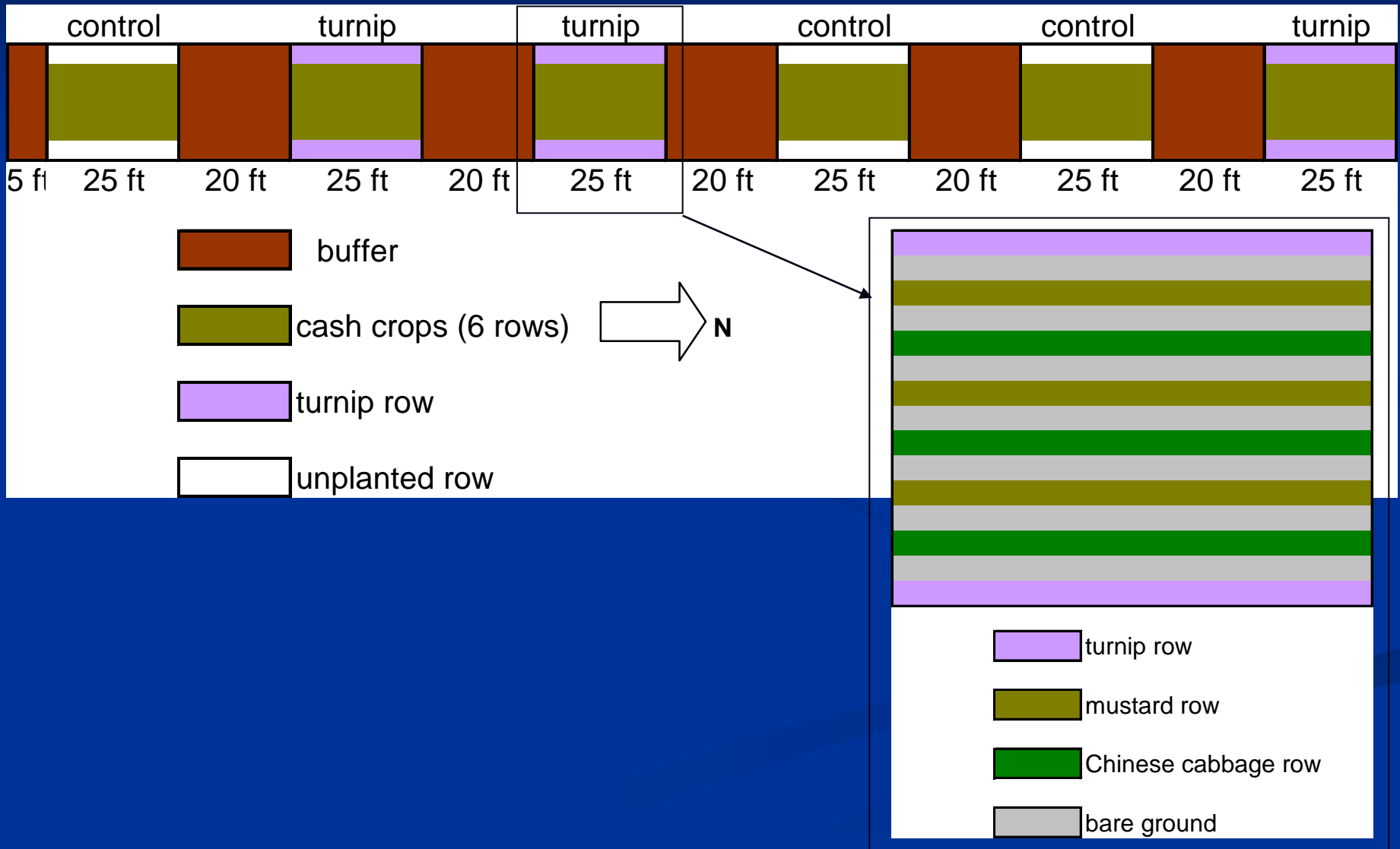
Objective

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

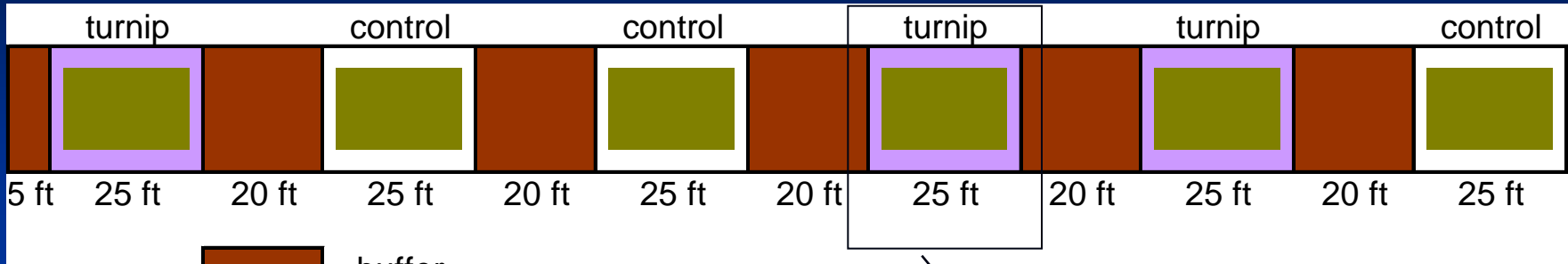
Hypothesis

Plots surrounded by turnip will have less YMLB than plots without turnip


Methods Spring 2012



Methods Winter 2012/2013

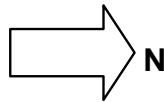


 buffer

 cash crops (6 rows)

 turnip

 unplanted



 turnip

 mustard row

 Chinese cabbage row

 bare ground

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, 2012 and 29 Nov 2012 – 17 Jan 2013
- 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



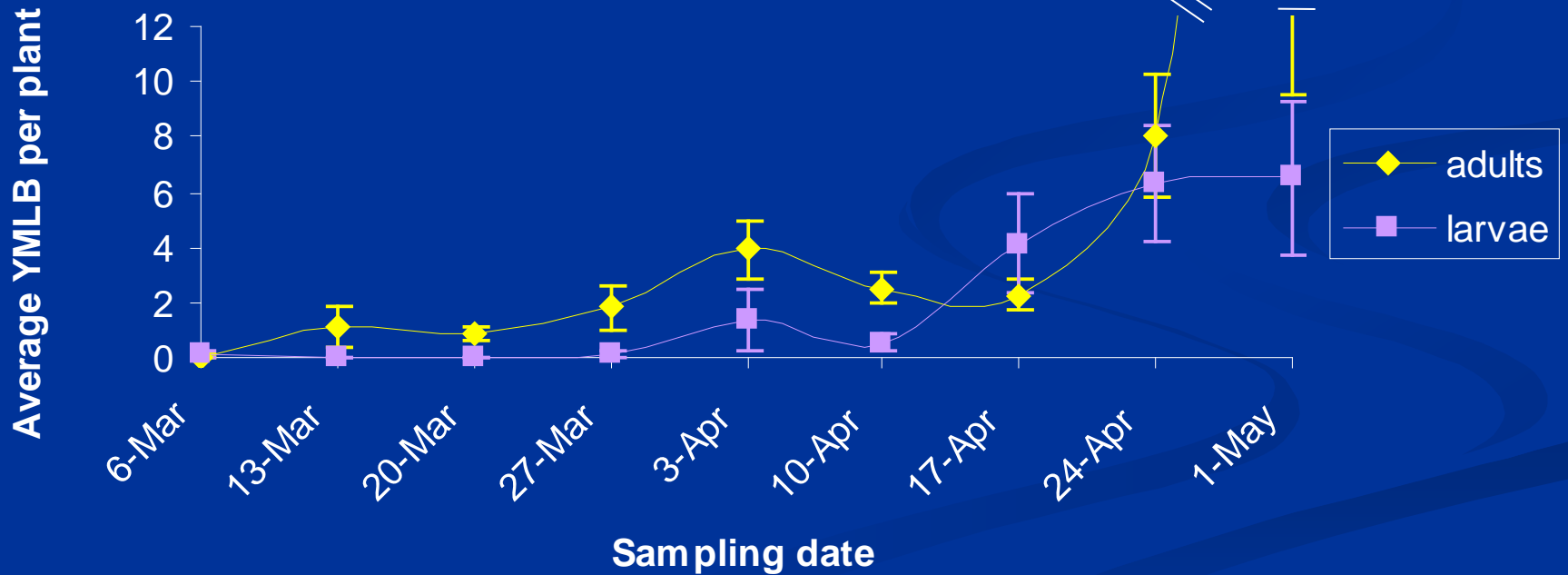
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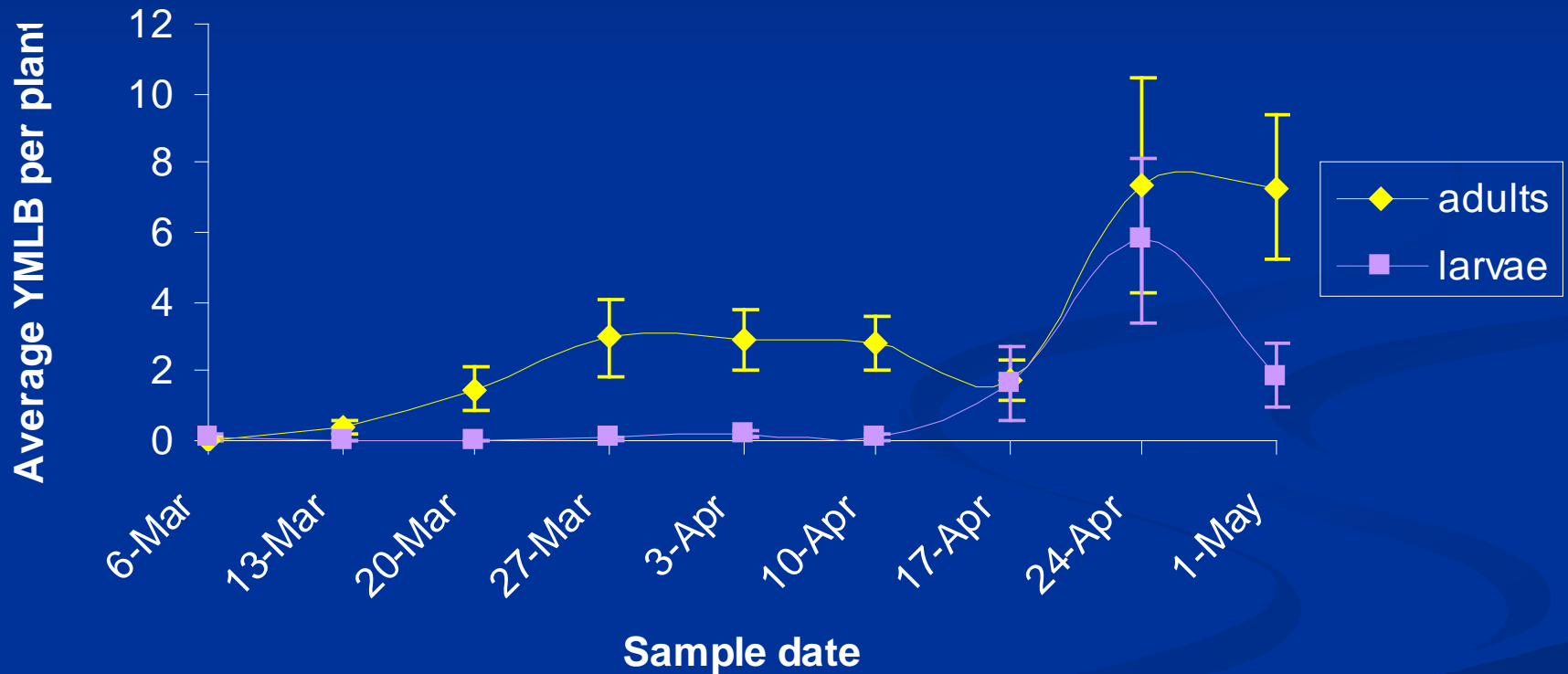
6



Results 2012: mustard

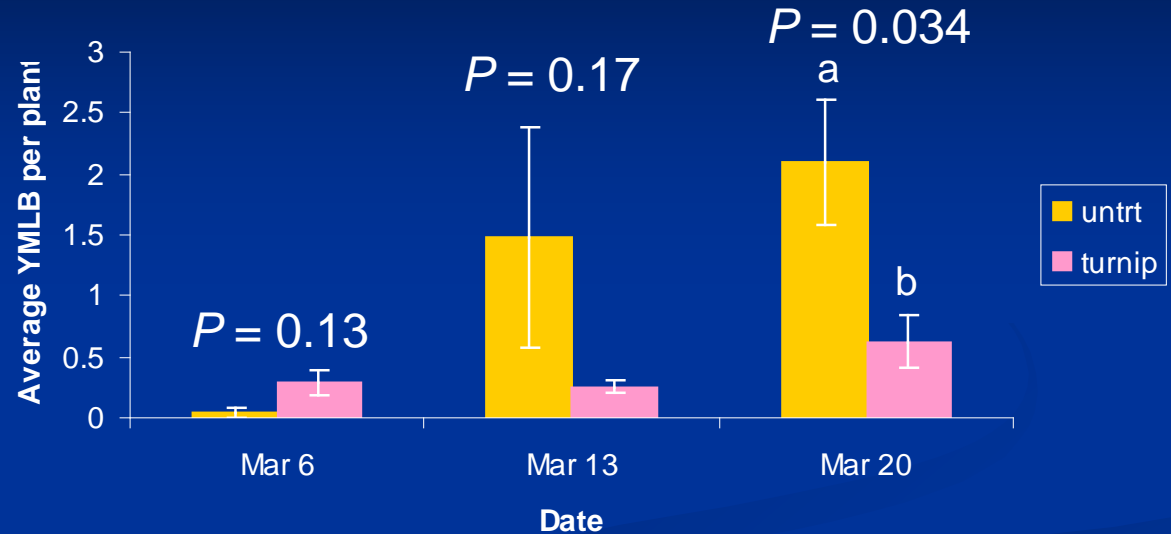


Results 2012: napa cabbage



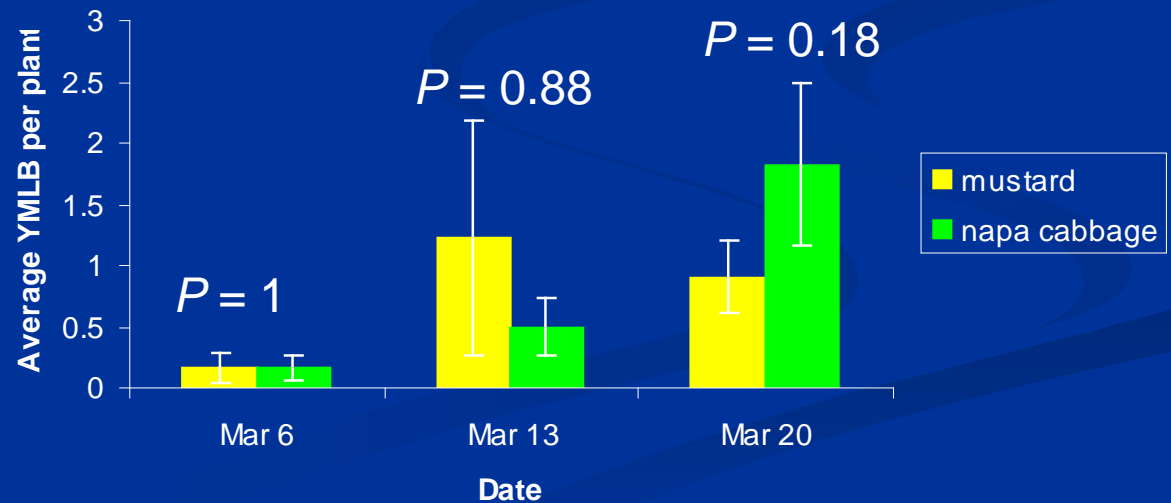
Results 2012: YMLB numbers

Treatment



Treatment*Crop
all $P > 0.4$

Crop

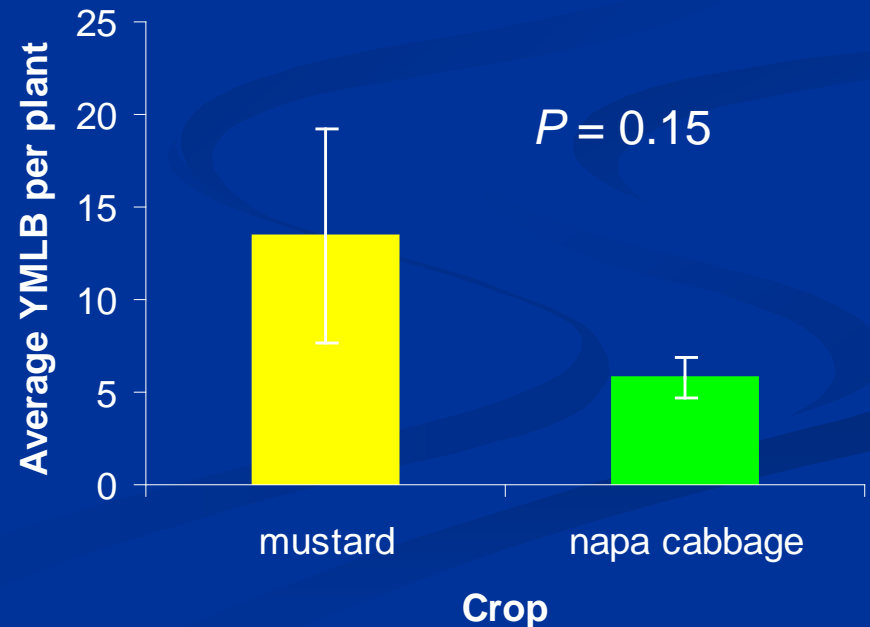
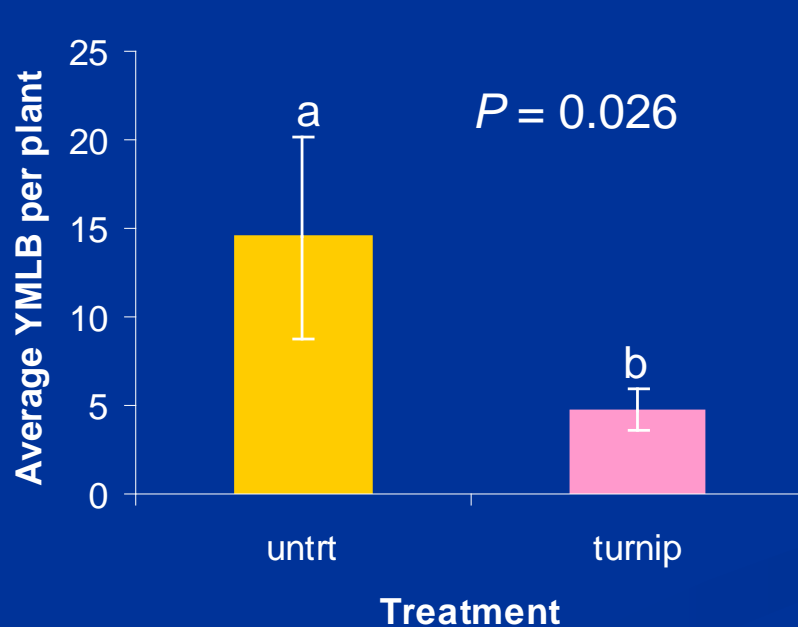


Results 2012: YMLB numbers

27 Mar to 1 May

Interaction with time: all $P > 0.07$

Treatment*Crop $P = 0.93$



Results 2012: harvest evaluation

Treatment*Crop $P = 0.76$

Treatment

Untreated: 3.9 ± 0.3

Turnip: 2.3 ± 0.1

$P = 0.0005$

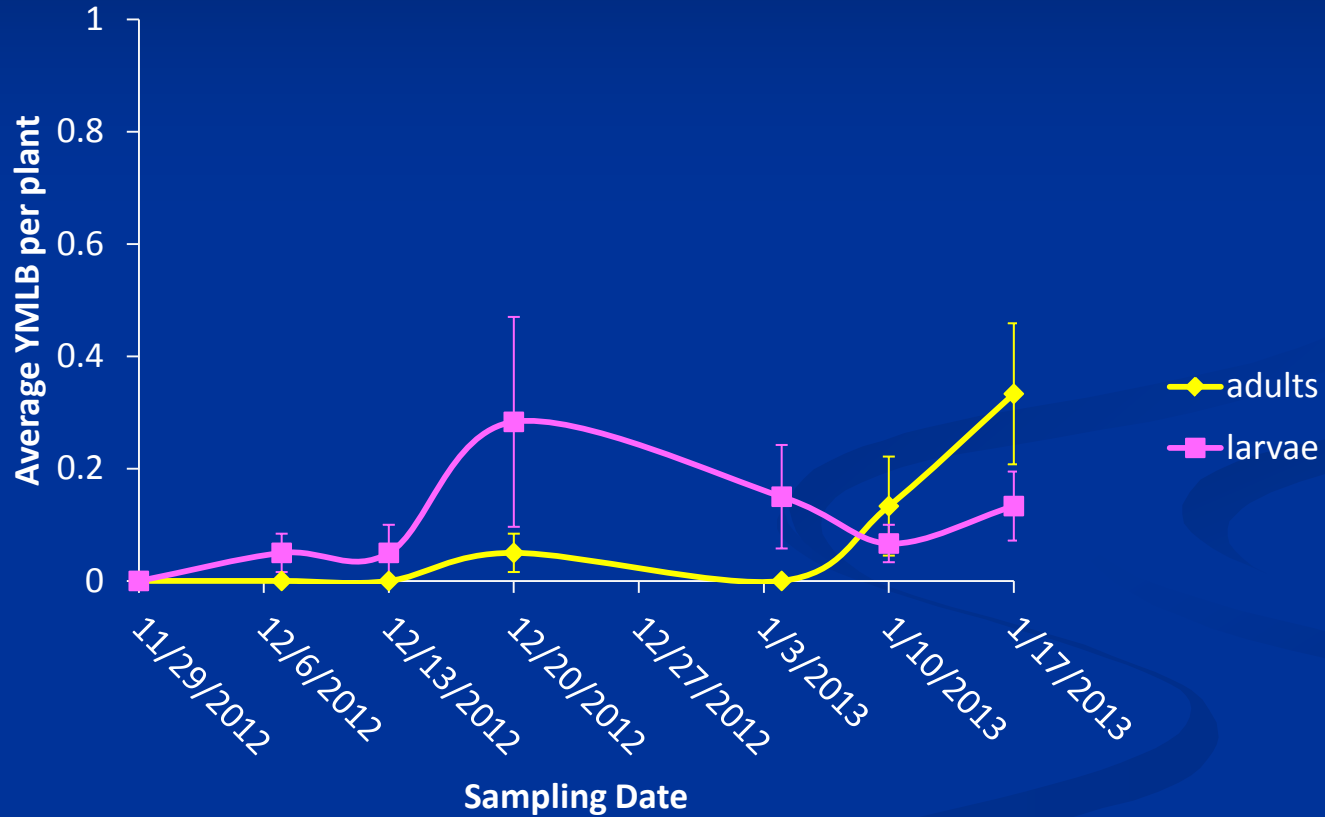
Crop

Mustard: 3.4 ± 0.4

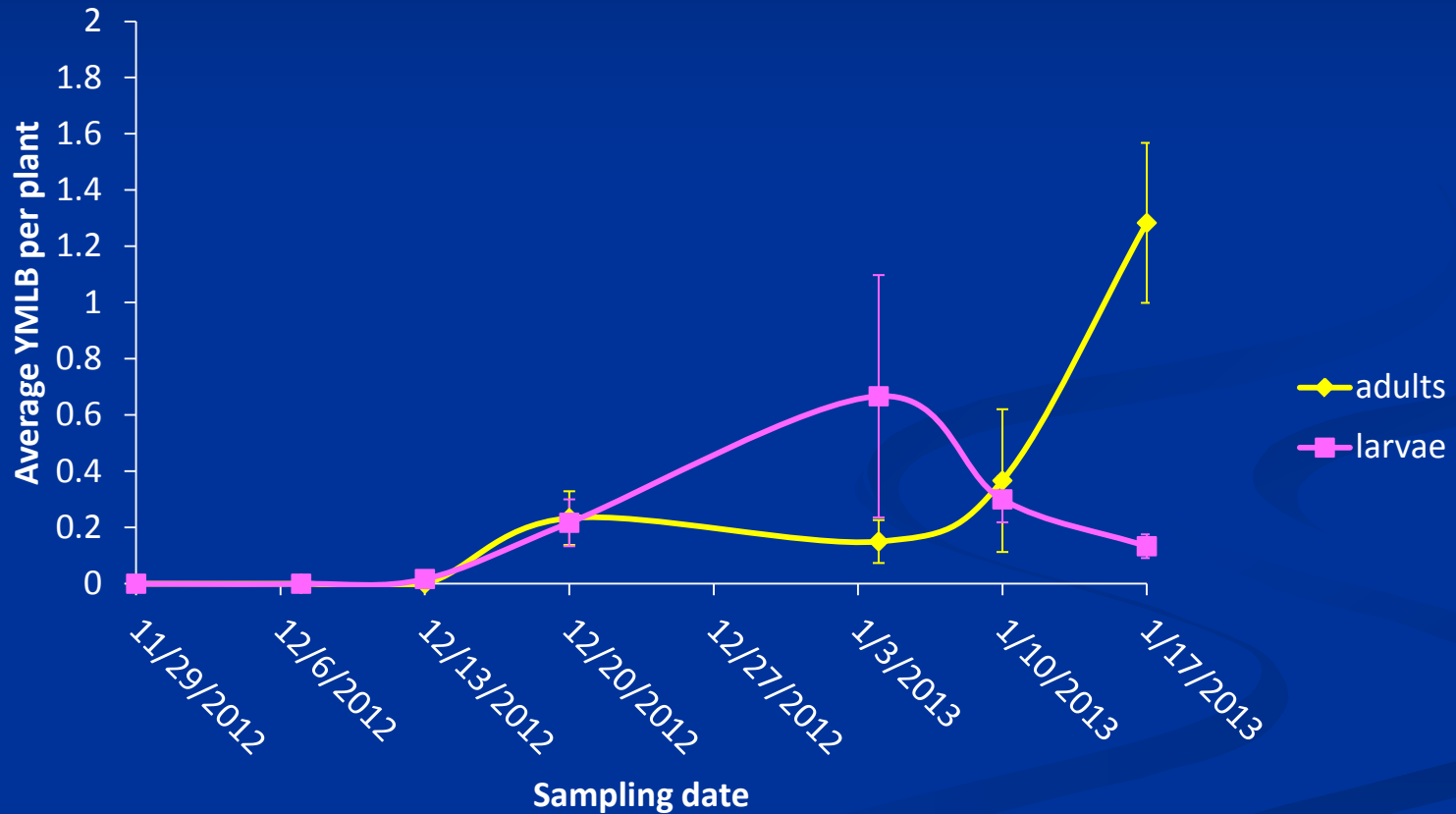
Napa cabbage: 2.7 ± 0.4

$P = 0.025$

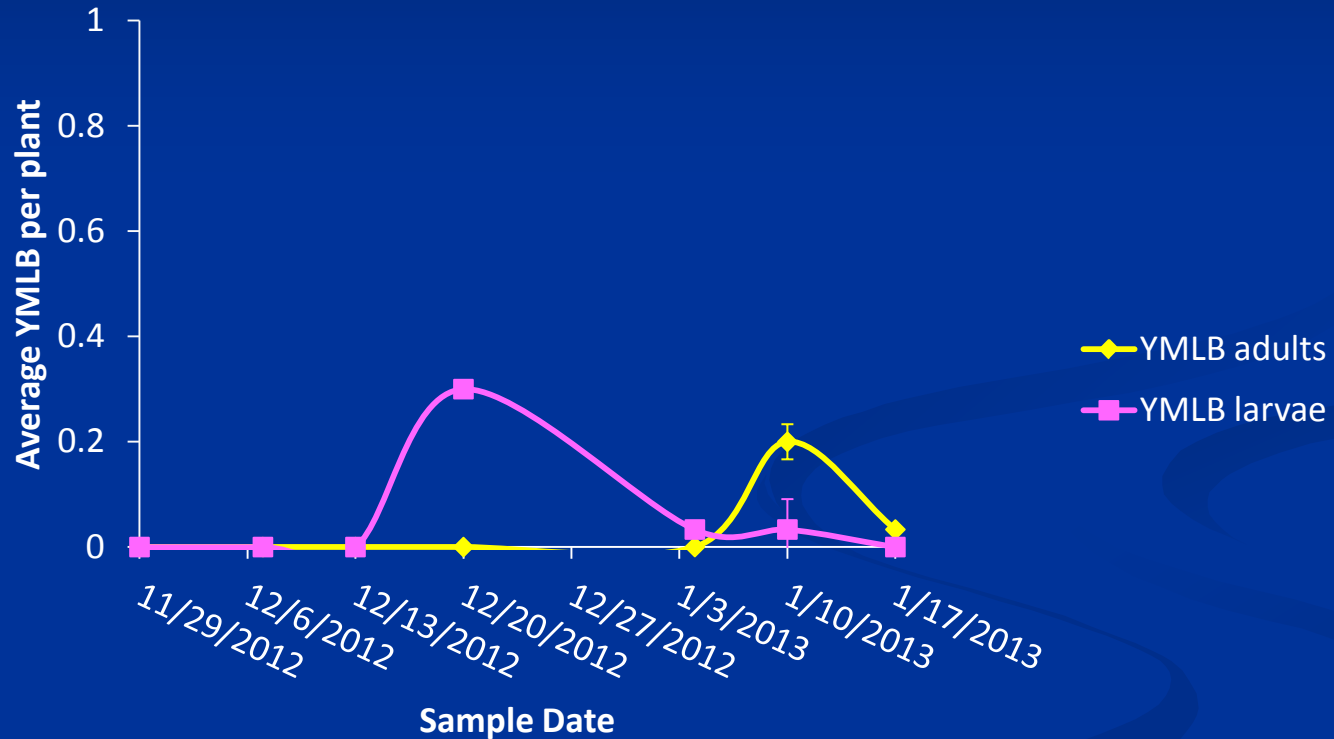
Results 2012/2013: mustard



Results 2012/2013: napa cabbage



Results 2012/2013: turnip (trap crop)



Results 2012/2013: YMLB numbers

Time interactions all $P \geq 0.06$

Treatment*Crop $P = 0.35$

Treatment

Untreated: 0.2 ± 0.1

Turnip: 0.6 ± 0.1

$P = 0.03$

Crop

Mustard: 0.2 ± 0.1

Napa cabbage: 0.6 ± 0.1

$P = 0.07$

Results 2012: harvest evaluation

Treatment*Crop $P = 0.79$

Treatment

Untreated: 1.2 ± 0.1

Turnip: 1.3 ± 0.1

$P = 0.3$

Crop

Mustard: 1.1 ± 0.1

Napa cabbage: 1.4 ± 0.1

$P = 0.04$

Discussion

- Turnip appears to be an effective trap crop useful in combination with other techniques
- An action threshold for spraying the turnip must include an injury assessment

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