

Effect of $C. I.$ on navy



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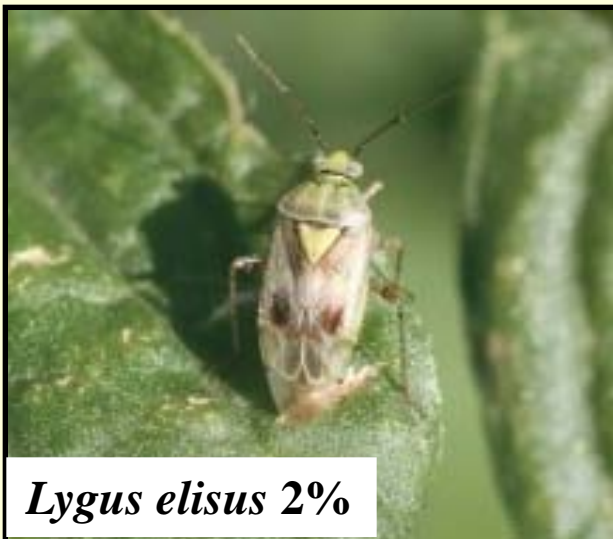
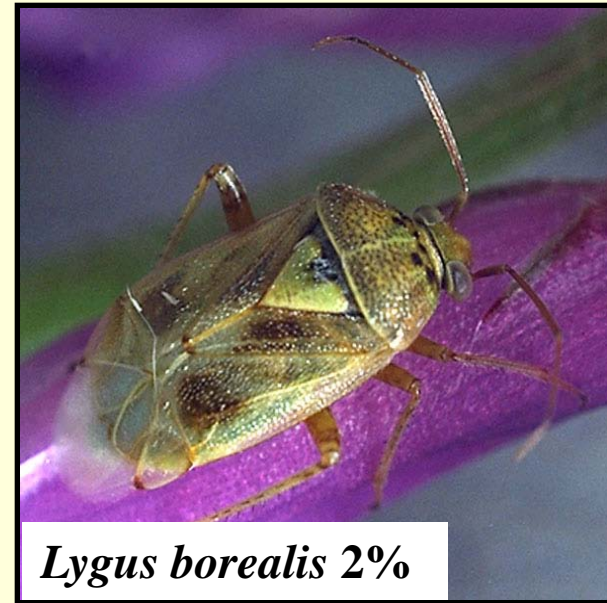
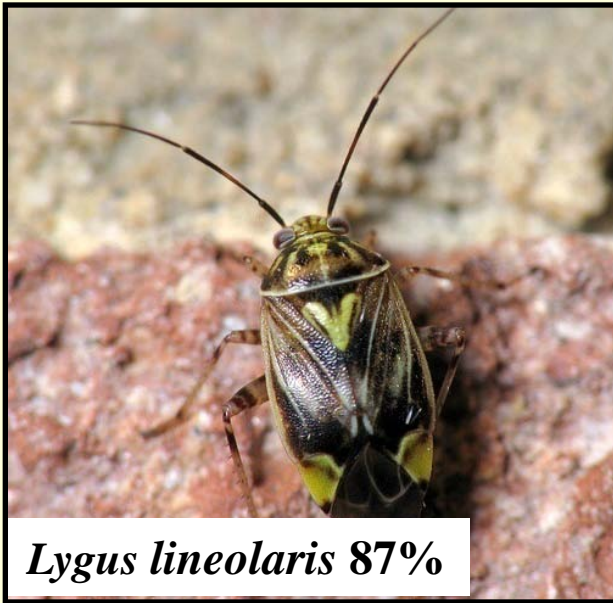
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University of Manitoba, Canada R3T 2N2

Objectives

To examine the effect of different stages of plant bugs on different growth stages of navy beans

Plant bugs on navy beans in Manitoba



Different spatial scales

Whole plot



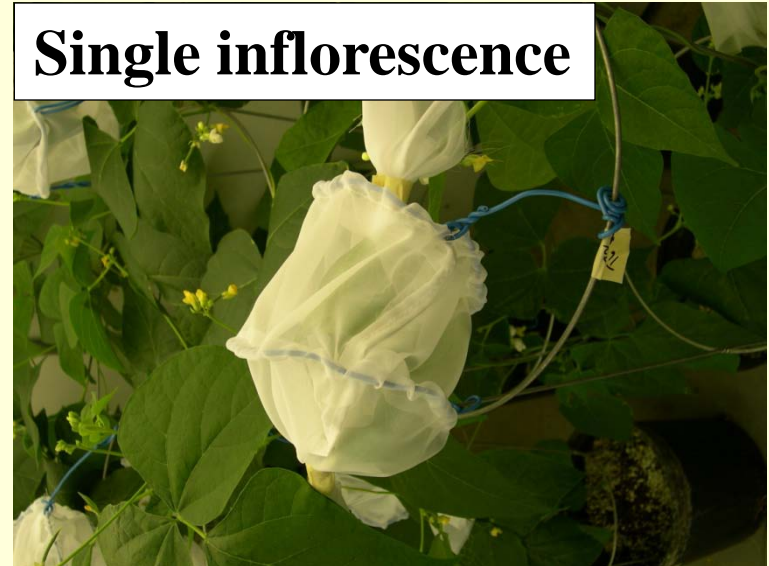
Field cage



Whole plant



Single inflorescence



Plant and insect stages

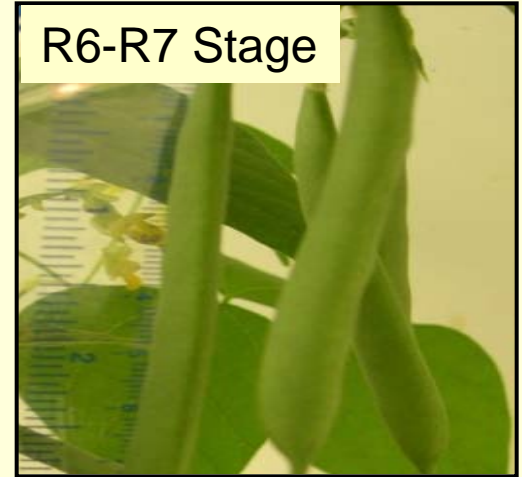
R2-R3 Stage



R4-R5 Stage



R6-R7 Stage



Adults



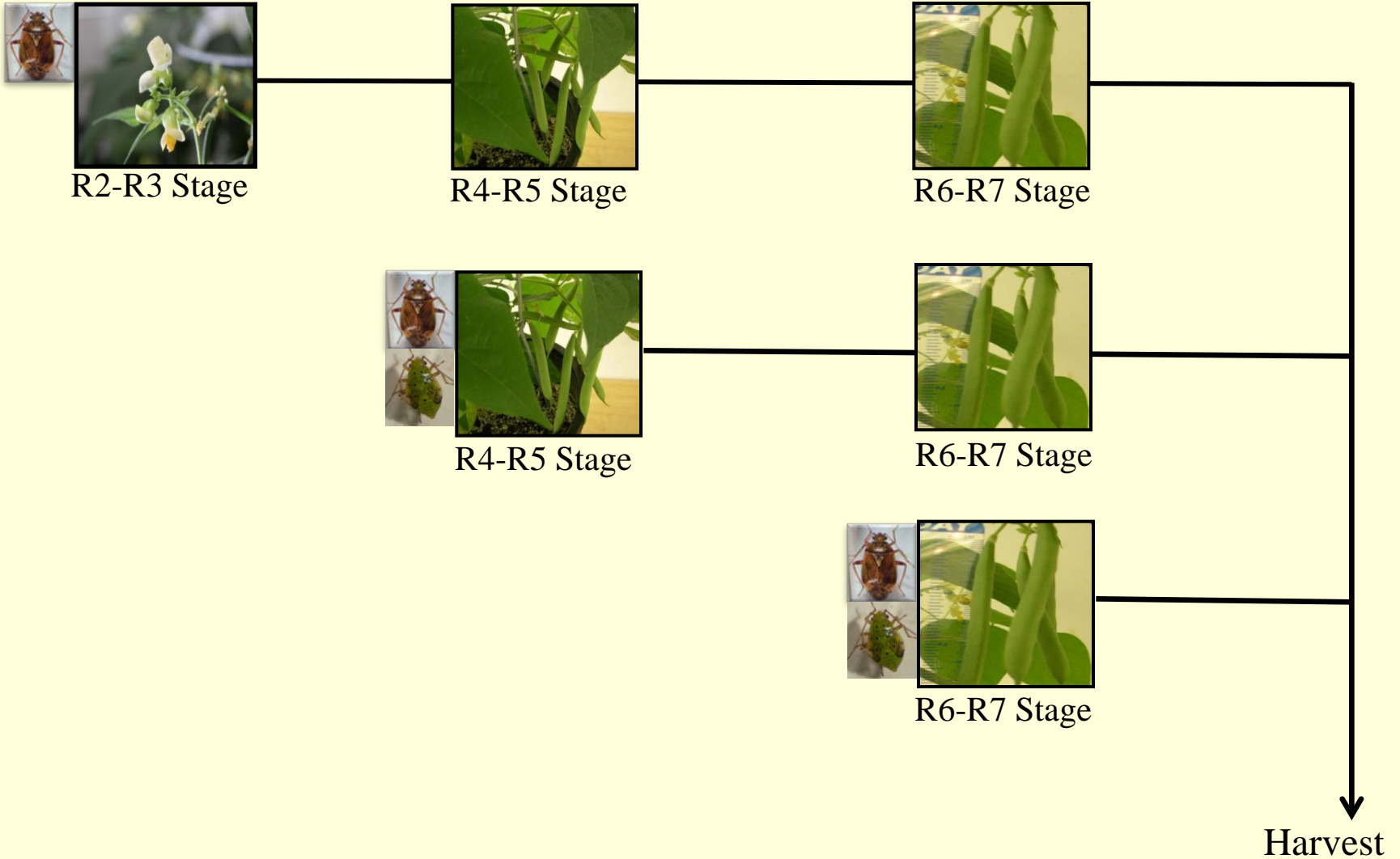
5th instar Nymphs

| Crop stage | R2-R3 | R4-R5 | R6-R7 |
|----------------------|-------------------|-------------------|-------------------|
| Inflorescence | X | X | X |
| Whole plant | X | X ? | X |
| Field cage | 2009, 2011 | 2011, 2011 | 2010, 2011 |

Field cage studies



Field cage studies

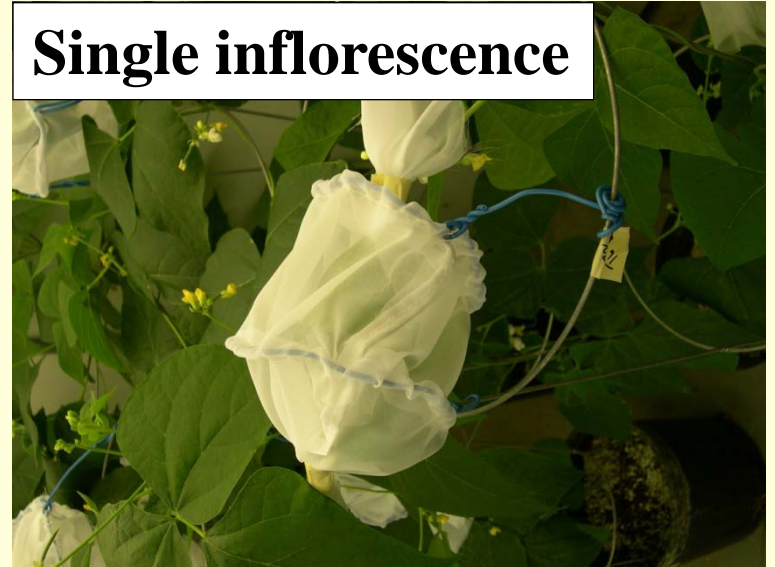


Laboratory experiments

Whole plant



Single inflorescence



Processing of samples

Yield quantity

Assessed in the laboratory

Seed weight and seed
number

Marketable seed weight

Quality of seeds

Field cage samples:

Commercial grading

Laboratory experiments:

Graded in the lab

R2-R3 stage experiments



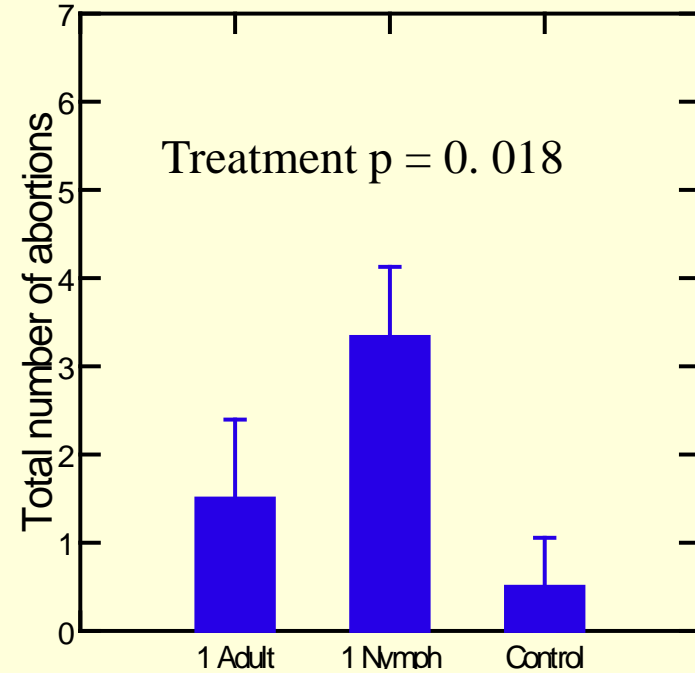
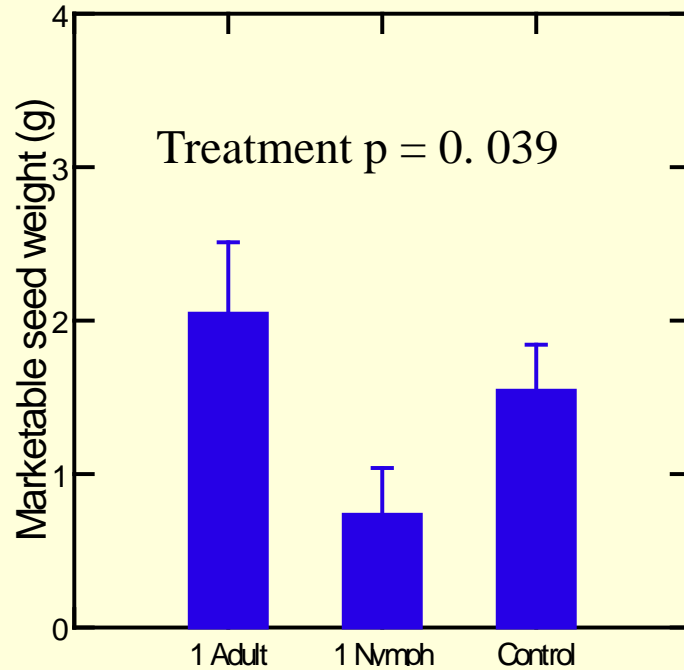
R2-R3:Field cage study year 2009

| Treatment | Marketable seed yield (g/m²) |
|------------------|------------------------------------------------|
| Control | 95.1 9.6 |
| 30 adults | 86.8 6.8 |
| 60 adults | 68.7 9.2 |
| Significance | F= 5.2, d.f= 2, 10, p < 0.05 |

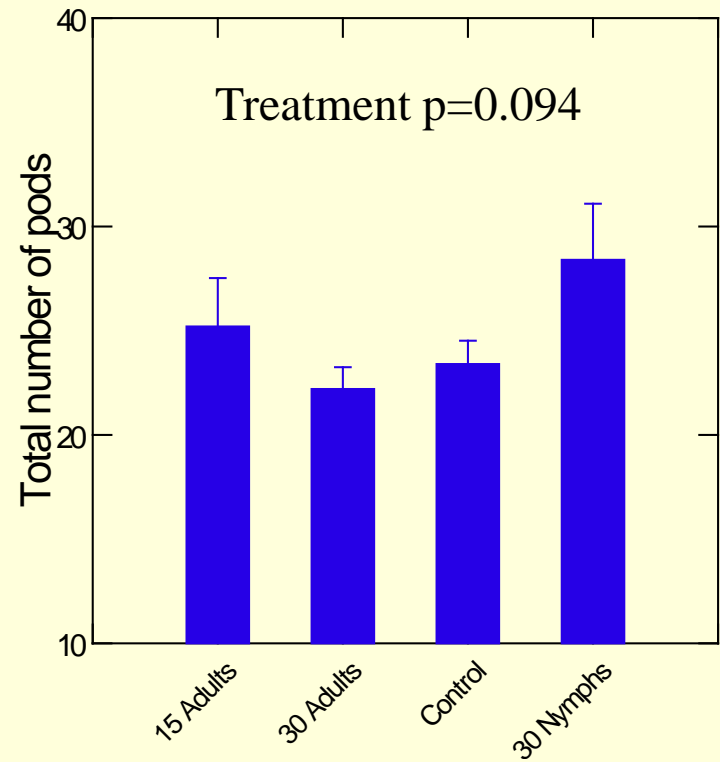
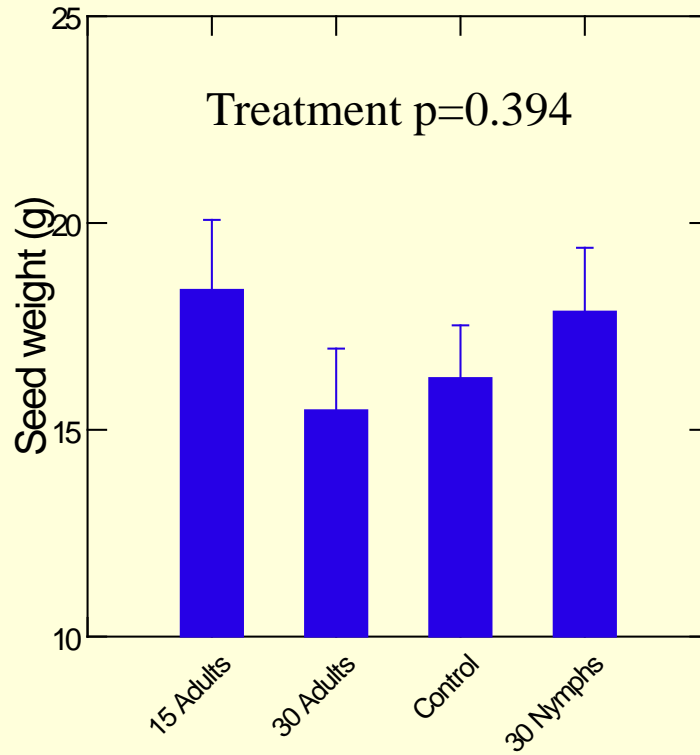
R2-R3 : Field cage study year 2011

| Treatment | Marketable seed yield (g/m²) | |
|------------------|----------------------------------------------------|------|
| Control | 213.8 | 11.3 |
| 30 adults | 272.6 | 22.4 |
| 60 adults | 311.4 | 13.7 |
| Significance | F= 10.7, d.f = 2, 28 p < 0.05 | |

R2-R3: Inflorescence level



R2-R3: Whole plant level



Summary R2-R3 stage

Cage study results

Crop compensation

Death of *Lygus* bugs

| Average Temperature (C) Winnipeg, Manitoba, Canada | | |
|--------------------------------------------------------|-------------|-------------|
| Month | 2009 | 2011 |
| June | 15.6 | 17.1 |
| July | 16.6 | 21.2 |
| August | 17.3 | 20.3 |
| September | 17.7 | 14.2 |

Source: Environment Canada

R4-R5 stage experiments



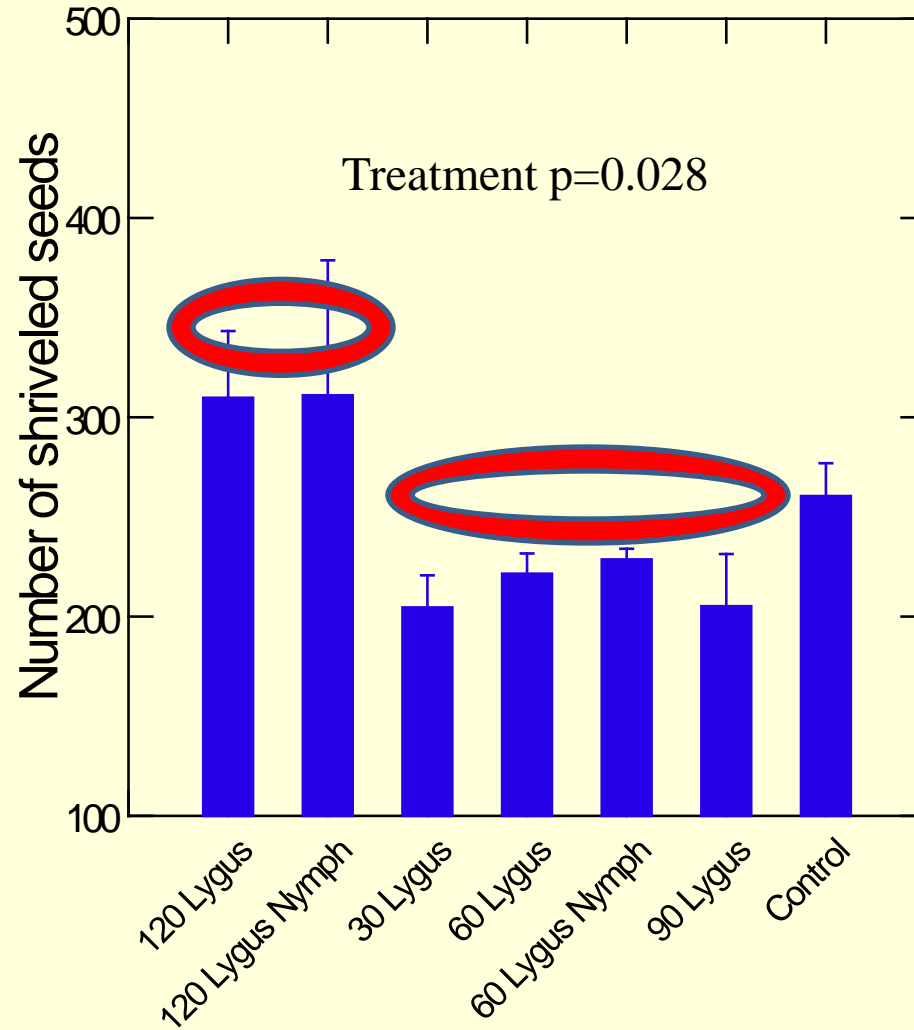
R4-R5 field cage study: year 2011

| Treatment | Marketable seed yield (g/m²) | |
|-------------------------|------------------------------------------------|------|
| Control | 250.0 | 14.4 |
| 30 <i>Lygus</i> adults | 206.5 | 12.4 |
| 60 <i>Lygus</i> adults | 243.5 | 18.7 |
| 60 <i>Lygus</i> nymphs | 168.7 | 5.1 |
| 90 <i>Lygus</i> adults | 236.0 | 21.1 |
| 120 <i>Lygus</i> nymphs | 175.0 | 36.0 |
| 120 <i>Lygus</i> adults | 240.4 | 9.1 |
| Significance | F= 3.4, d.f = 6, 23 p < 0.05 | |

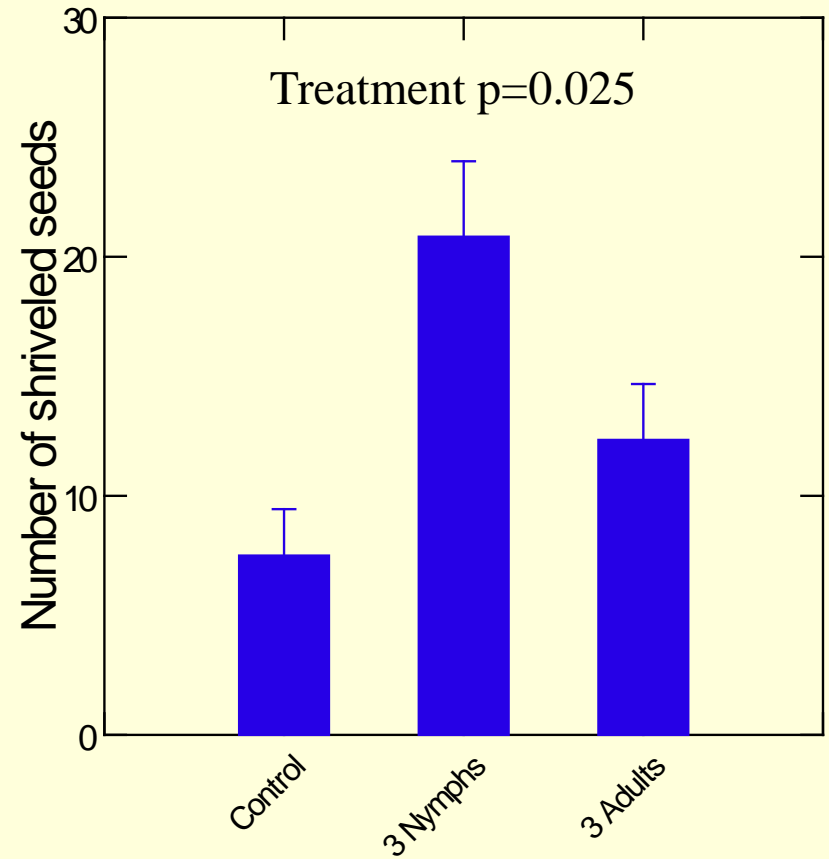
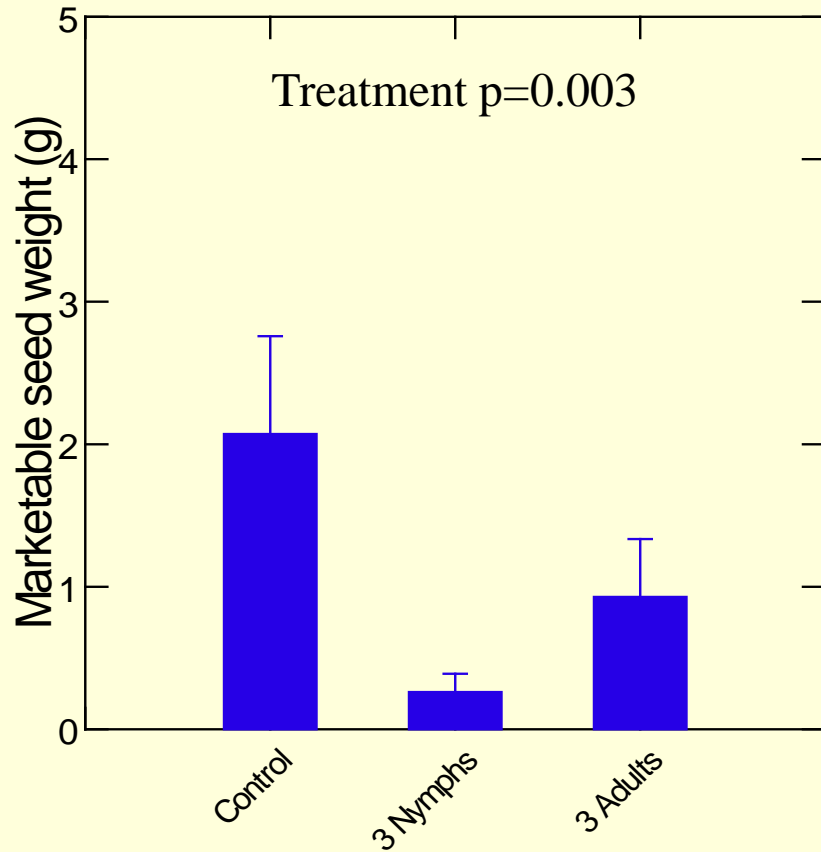
Average effect for the presence of adults or nymphs

| Stage | Marketable seed weight (Mean SE) | Average yield loss |
|---------|-------------------------------------|--------------------|
| Adult | 219.5 8.4 | 41.6g |
| Control | 261.1 12.7 | |
| Nymph | 176.4 15.1 | 84.7g |

Number of shriveled seeds



R4-R5 stage inflorescence level



Summary R4-R5 stage

Laboratory:

Seed shriveling is the major effect and lead to seed weight loss

Nymphs are more injurious than adults

Field:

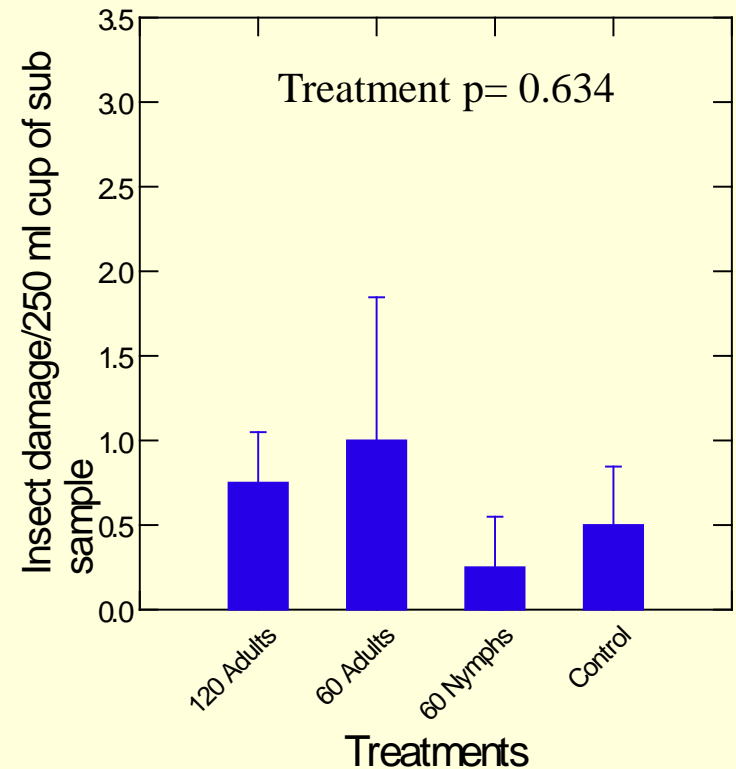
Preliminary results are perplexing

R6-R7 Experiments



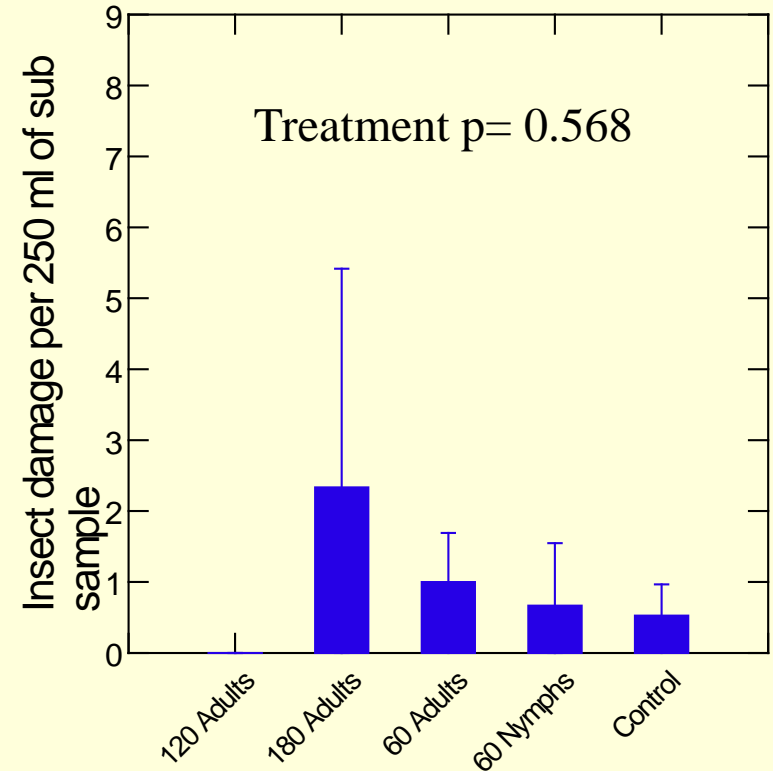
R6-R7 field cage study: year 2010

| Treatment | Marketable seed weight (g/m ²) |
|-------------------------|--------------------------------------------|
| Control (no insects) | 299.4 6.4 |
| 60 <i>Lygus</i> adults | 306.4 14.7 |
| 60 <i>Lygus</i> nymphs | 263.8 30.9 |
| 120 <i>Lygus</i> adults | 303.2 32 |
| Significance | F= 0.699, d.f= 3,12, p > 0.05 |

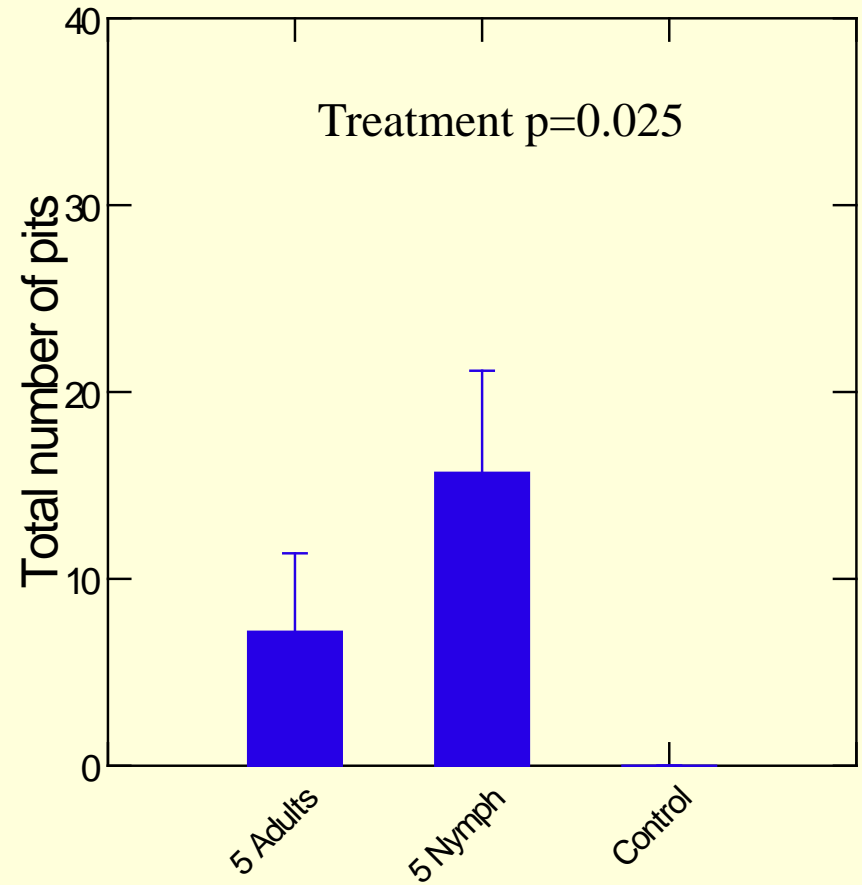
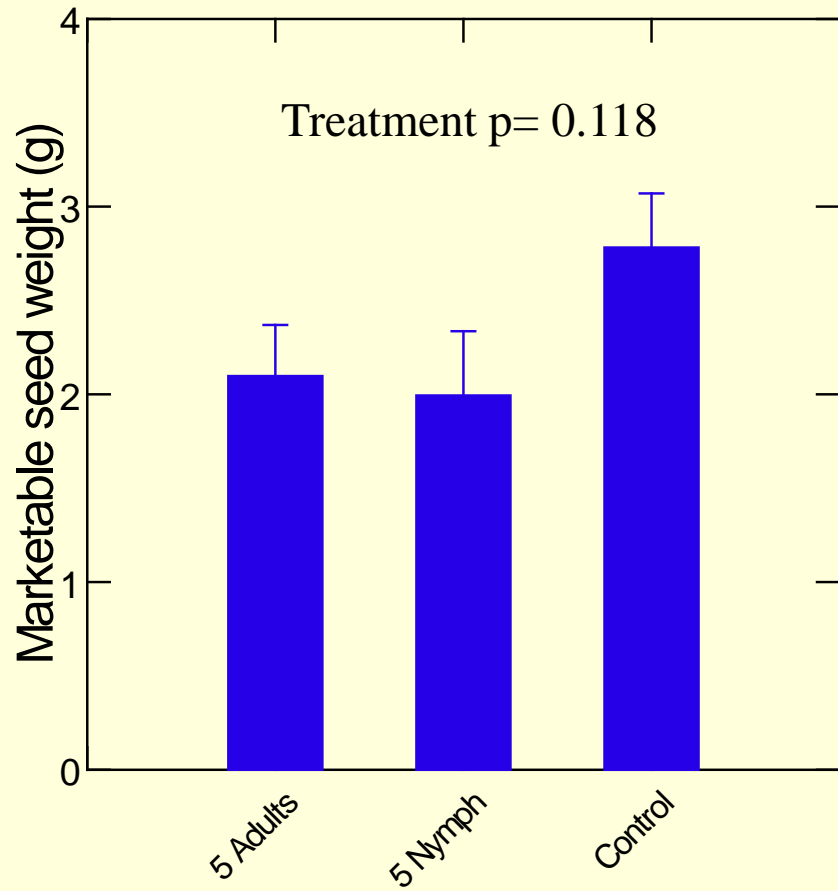


R6-R7 field cage study: year 2011

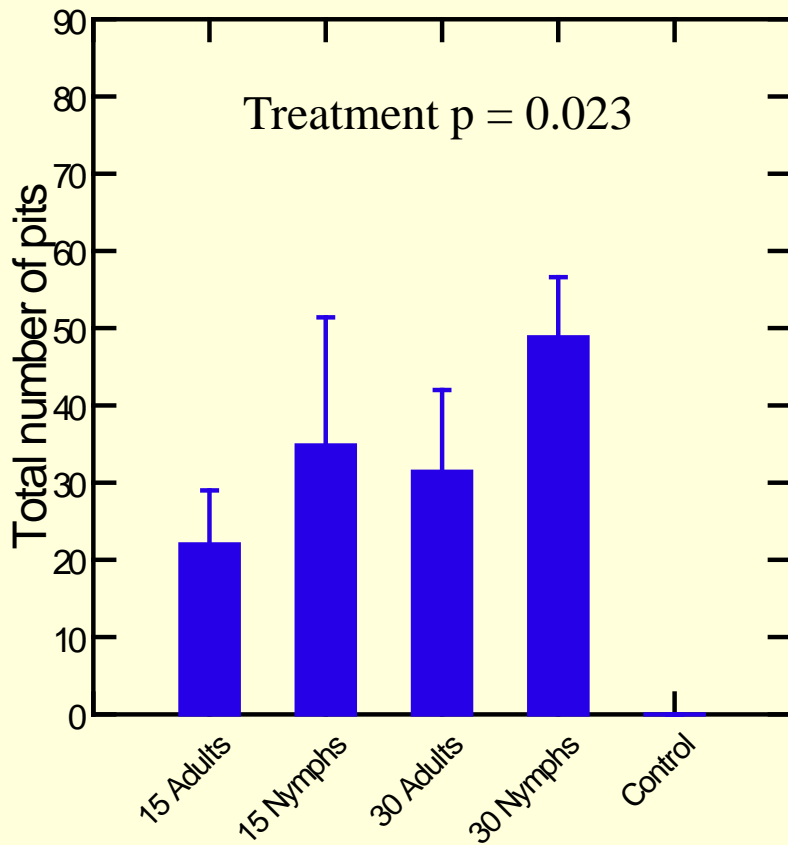
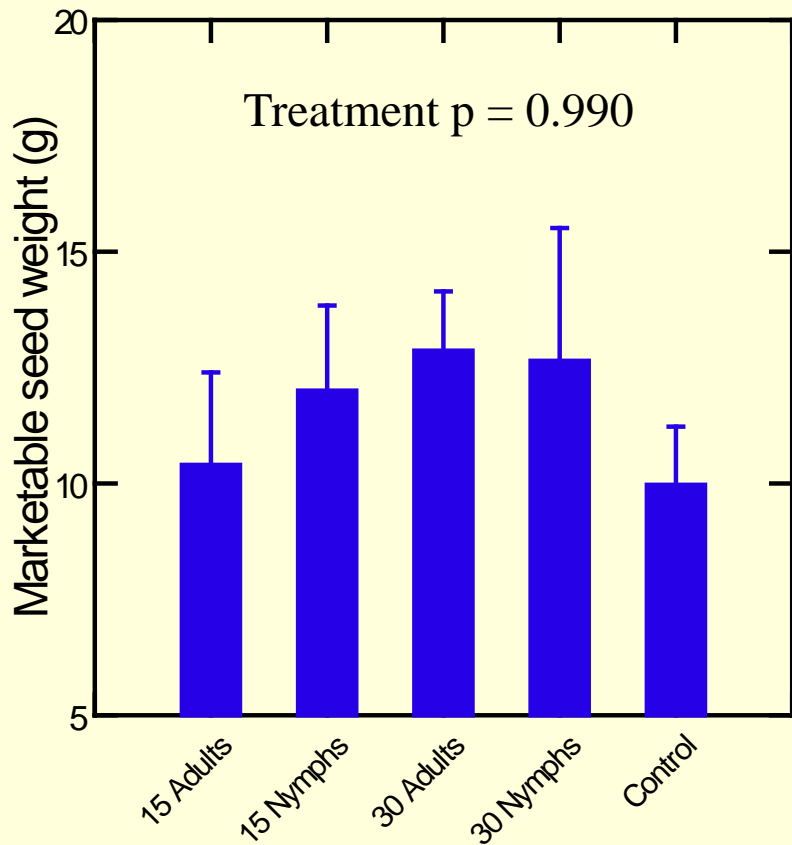
| Treatment | Marketable seed weight (g/m ²) | |
|-------------------------|--------------------------------------------|------|
| Control (no insects) | 251.8 | 14.0 |
| 60 <i>Lygus</i> adults | 234.6 | 32.0 |
| 60 <i>Lygus</i> nymphs | 273.5 | 3.5 |
| 120 <i>Lygus</i> adults | 236.6 | 35.0 |
| 180 <i>Lygus</i> adults | 236.2 | 25.0 |
| Significance | F= 0.380, d.f= 4,18, p > 0.05 | |



R6-R7 stage inflorescence level



R6-R7 stage whole plant level



Summary R6-R7 stage

No quality or quantity loss in the field cages

Quality loss occurred in the laboratory due to pitting

Concern about commercial grading

General Discussion

- Effect vary with crop growth stage
- Nymphs more injurious than adults
- R2 -R3
- R4-R5
- R6-R7

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Edible bean Growers
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Advisory committee :

Dr. Robert Lamb
Dr. Robert Currie
Dr. Susan Arntfield
Dr. Rob Gulden

THANK YOU