Lygus Bug Management Studies in Central Coast Strawberry

UC IPM
University of California
Agriculture and Natural Resources
Integrated Pest Management Program

Shimat Joseph and Mark Bolda
UC Cooperative Extension
1432 Abbott Street
Salinas, CA 93901

UC CE

Acknowledgements

- Growers, Pest Control Advisers
  Student assistants

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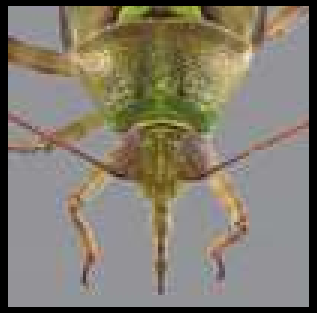
  - Agro-chemical companies
  - IR-4 Program

Life stages

Five nymphal stages

Mouthpart

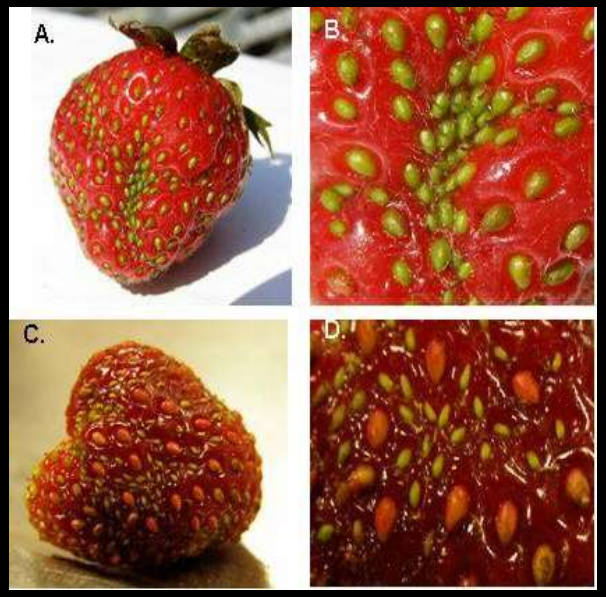


Damage

- “Cat-facing” - Irregularly shaped strawberries
- Feeding on seeds- affecting normal growth of the tissue beneath the achenes
- Risk period: Flower opening to ~10 days after petal fall
- Damage from nymphs when there are more flowers than fruits – early summer

Damage

- Not all Cat-faced strawberries are related to lygus bug feeding
  - Improper pollination (cold weather or frost injury)
  - Lygus bug injured achenes will be hollow
  - Lygus bug damage could be severe during the summer
- Do NOT base your sprays on incidence of cat-faced berry



http://www.omafra.gov.on.ca/english/crops/hort/news/hortmatt/2006/14hrt06a1.htm

Outline

- Insecticide efficacy trial 2016
- Comparison of “bug vac” and insecticide tactics
- Utility of electrostatic spray

Insecticide efficacy trial 2016

Treatment

Treatment	Rate amt/acre
Avaunt	5 oz
Avaunt	6 oz
Actara + Danitol 2.4 EC	3 oz + 10.66 fl oz
Beleaf	2.85 oz
Rimon 0.83EC	12 fl oz
Rimon 0.83EC + Assail 30SG	12 fl oz + 5.3 oz
Rimon 0.83EC + Brigade WSB	12 fl oz + 16 oz
Sequoia	4.5 fl oz
Sivanto	14 fl oz

Dyne-Amic added to all treatments at 0.25 v/v

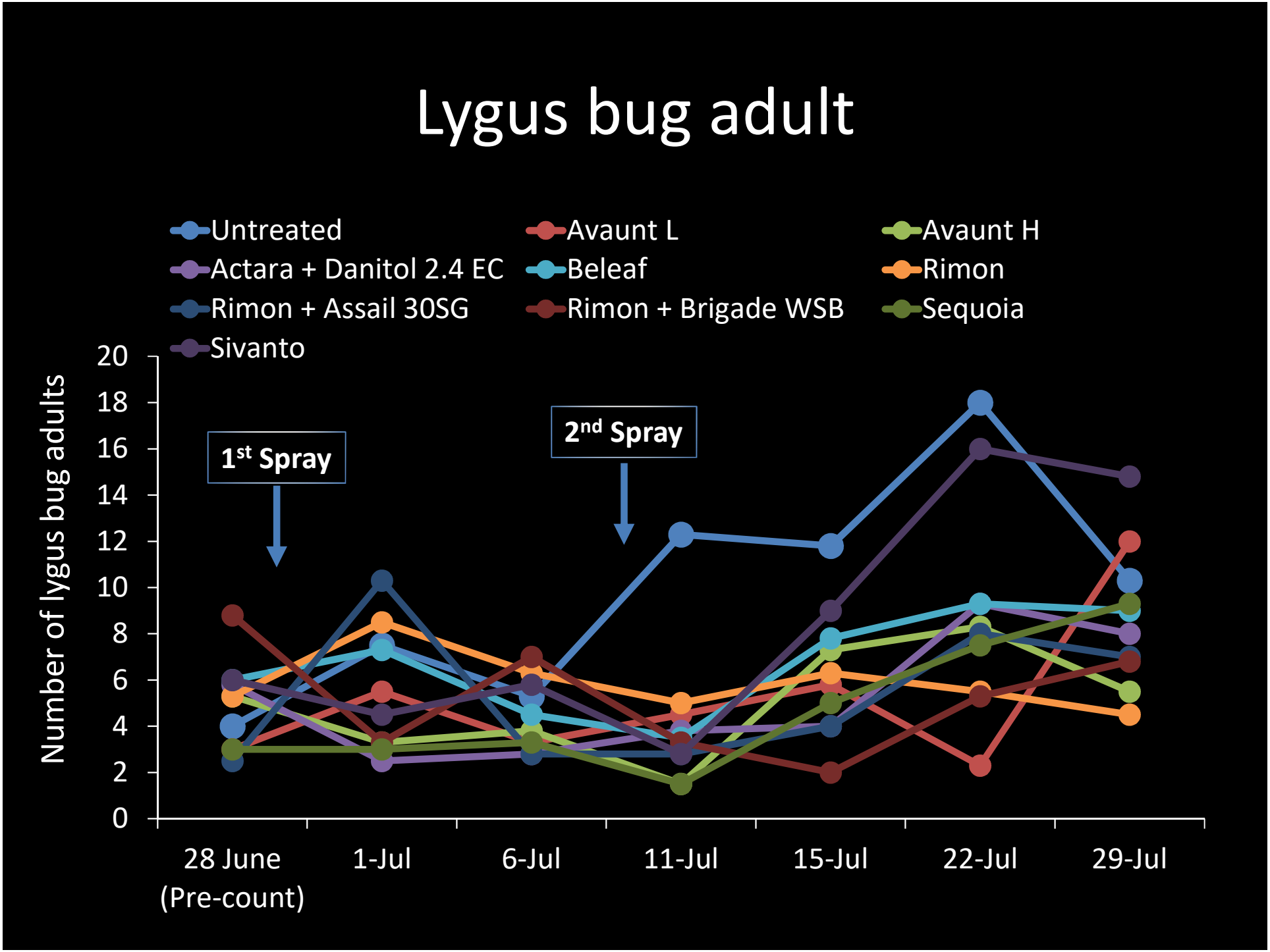
Insecticide application

- Insecticides applied using commercial tractor mounted sprayer
- Water volume 150 gal/acre
- Two insecticide applications
- Plot design: Randomized complete block design with 4 replications
- Plot size: 6 beds by 50 ft long

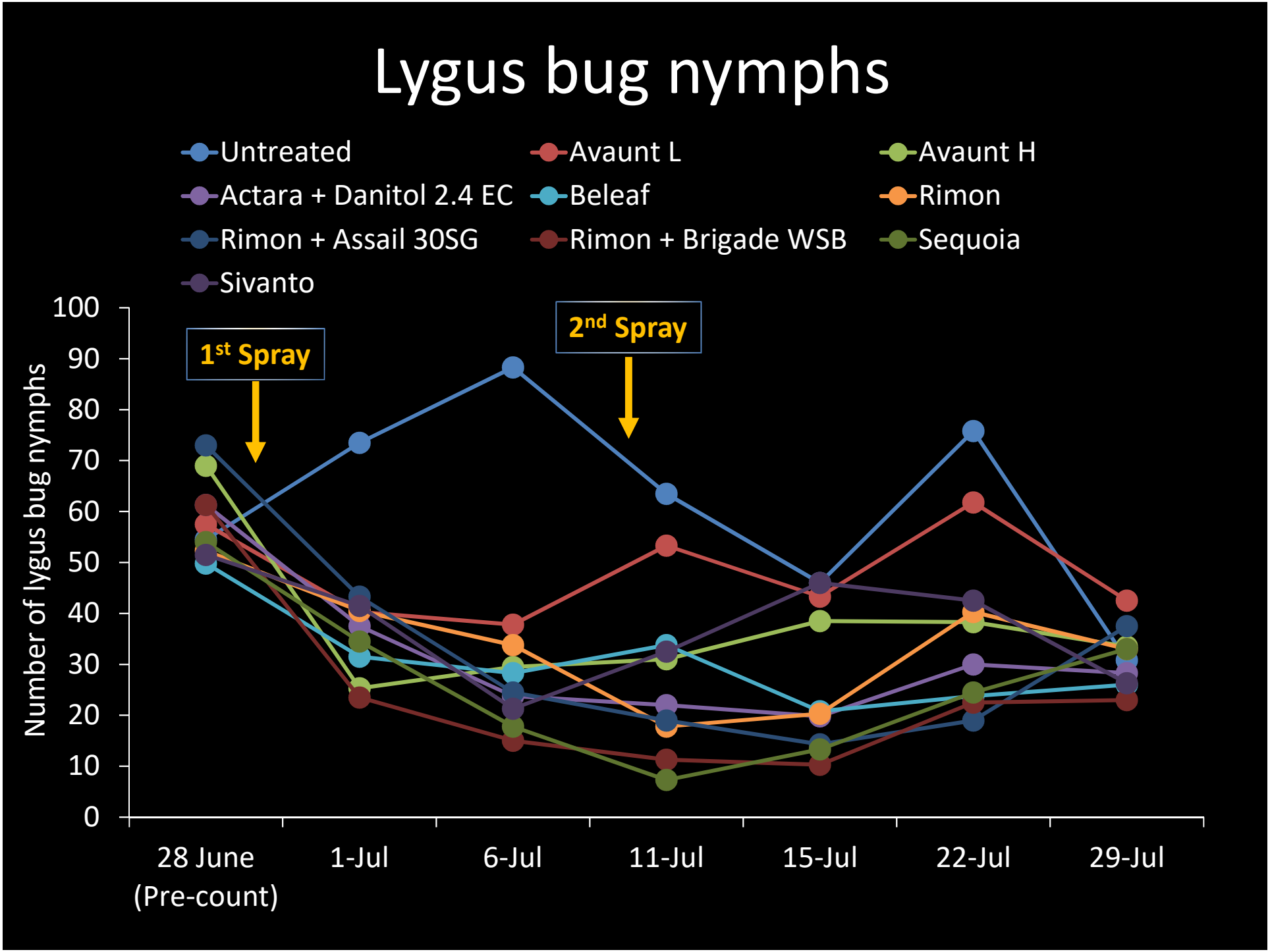
Evaluation

- Sampled 20 plants per plot
- Beat tray sampling: Five strikes per plant with the lid
- Sampling:
  - Pre-count
  - First application: 2 and 7 days
  - Second application 2, 7, 14, 21 days
- 60 fruits randomly sampled from each plot at 21 day after second application

Lygus bug adult



Lygus bug nymphs



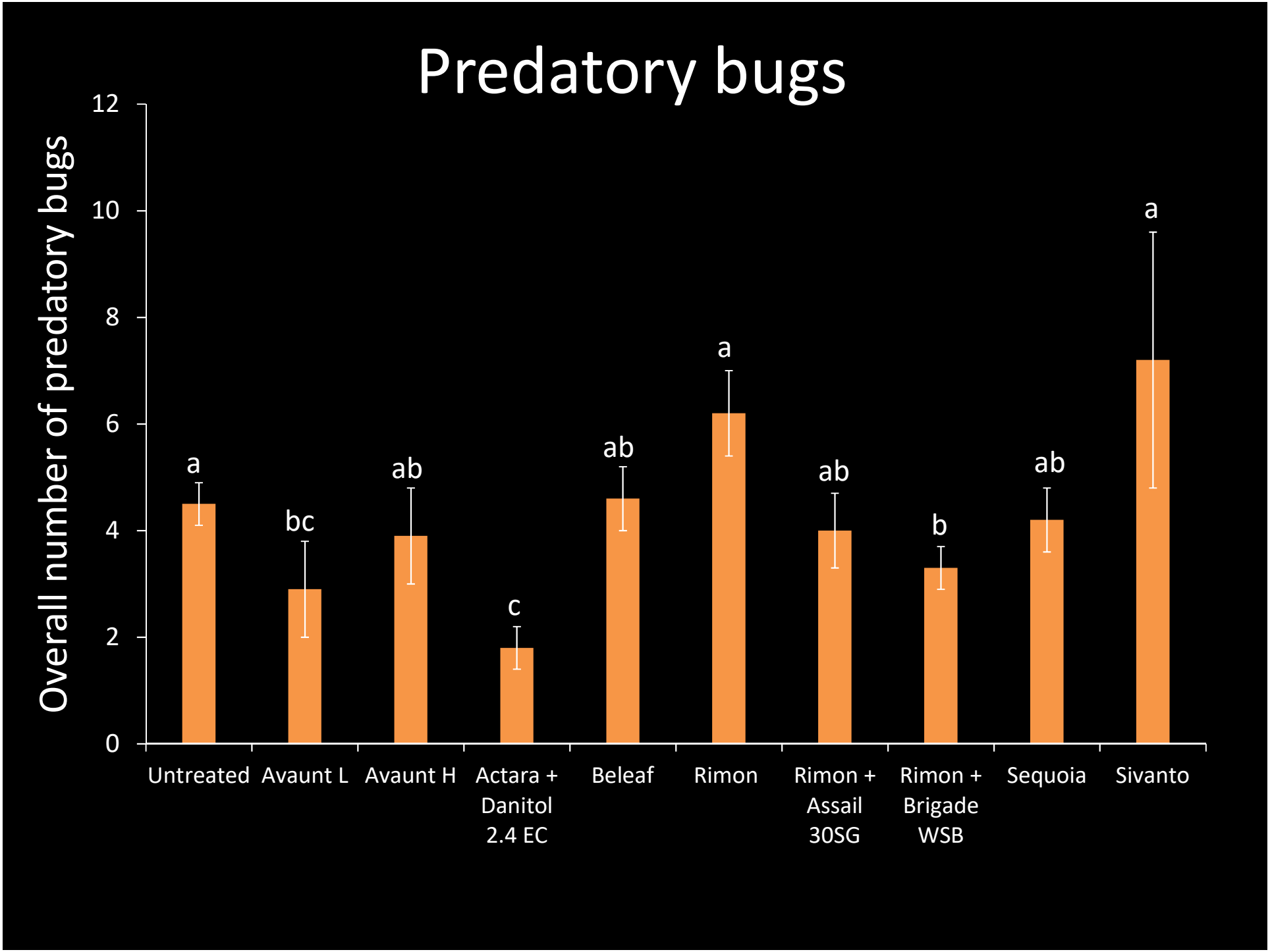
Catfaced fruits

Predatory bugs

Bigeyed bug

Minute pirate bug

Damsel bug


Predatory bugs
Overall number of predatory bugs
0
2
4
6
8
10
12
a
bc
ab
c
ab
a
ab
b
ab
a
Untreated
Avaunt L
Avaunt H
Actara + Danitol 2.4 EC
Beleaf
Rimon
Rimon + Assail 30SG
Rimon + Brigade WSB
Sequoia
Sivanto

Spiders


Overall number of spiders
0
2
4
6
8
10
12
14
a
ab
a
bc
ab
ab
a
c
a
a
Untreated
Avaunt L
Avaunt H
Actara + Danitol 2.4 EC
Beleaf
Rimon
Rimon + Assail 30SG
Rimon + Brigade WSB
Sequoia
Sivanto

Comparison of “bug vac” and insecticide tactics

Treatment

Treatment	Product/method	Rate per acre
Untreated	-	-
Insecticide spray*	Sequoia only	4.5 fl oz
Vacuum	Bug vac only	-
Insecticide spray* + Vacuum	Sequoia + Bug vac	4.5 fl oz

*Dyne-Amic added at 0.25 v/v

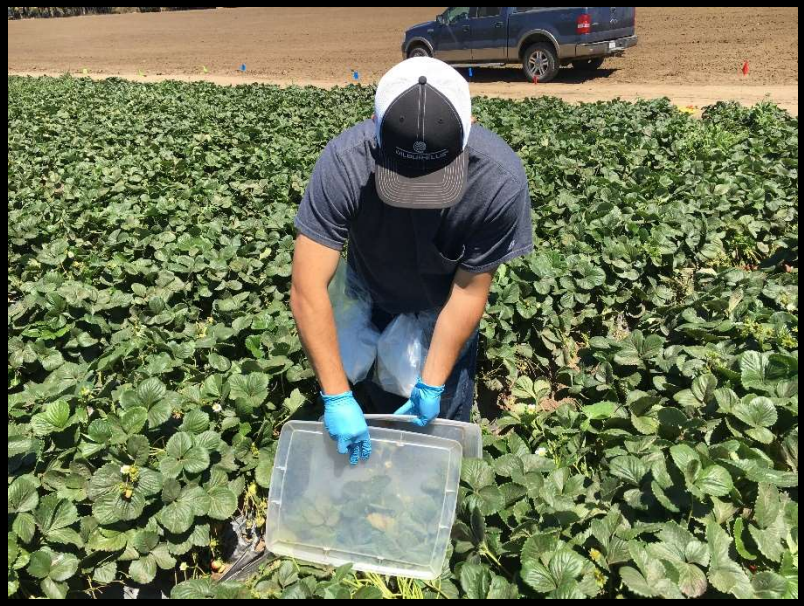
Insecticide application

- Insecticides (Sequoia) applied using commercial tractor mounted sprayer
- Water volume 150 gal/acre
- Two insecticide applications
- Plot design: Randomized complete block design with 4 replications
- Plot size: 6 beds by 50 ft long

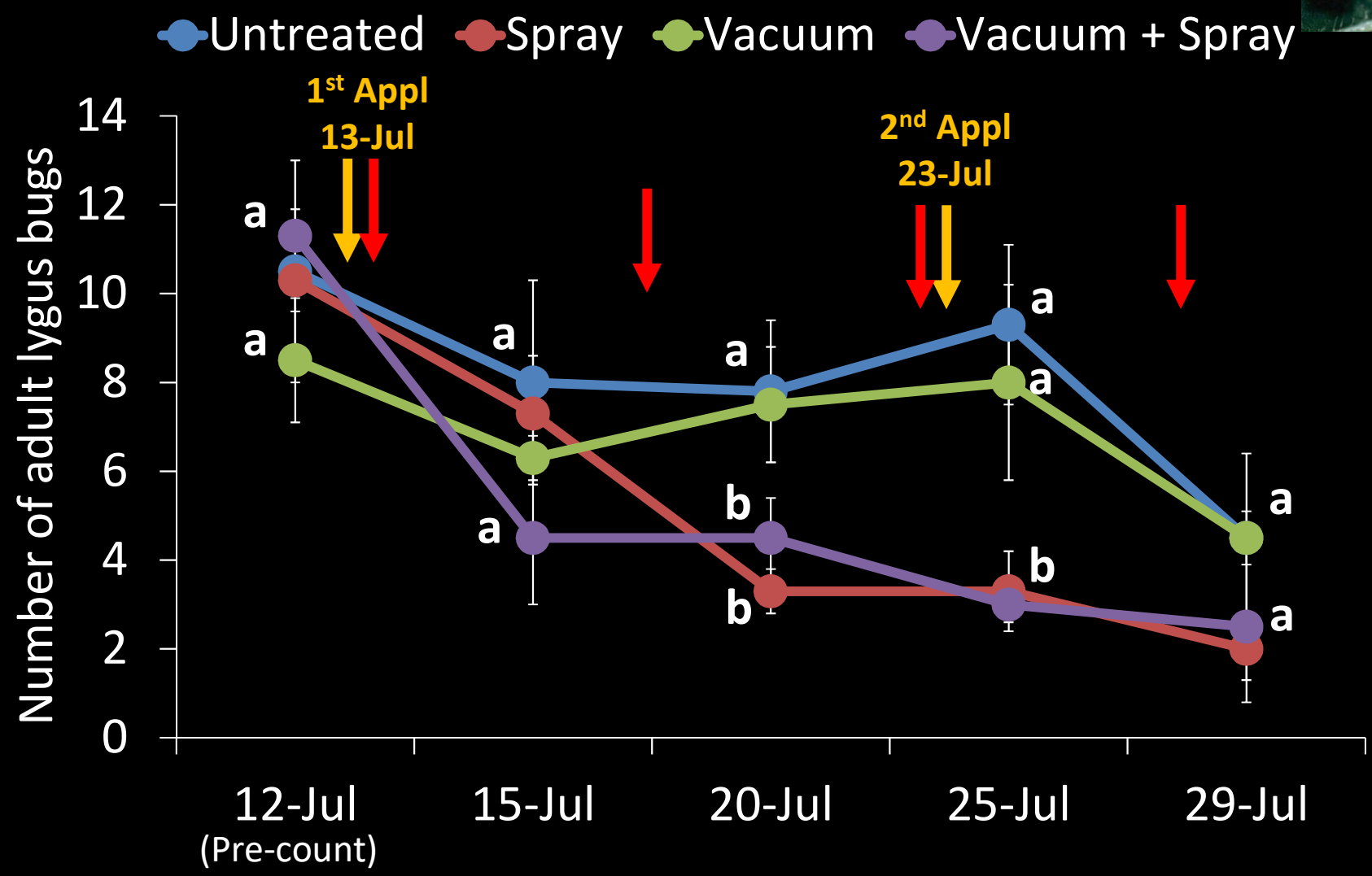
Vacuumed twice a week for two weeks

Evaluation

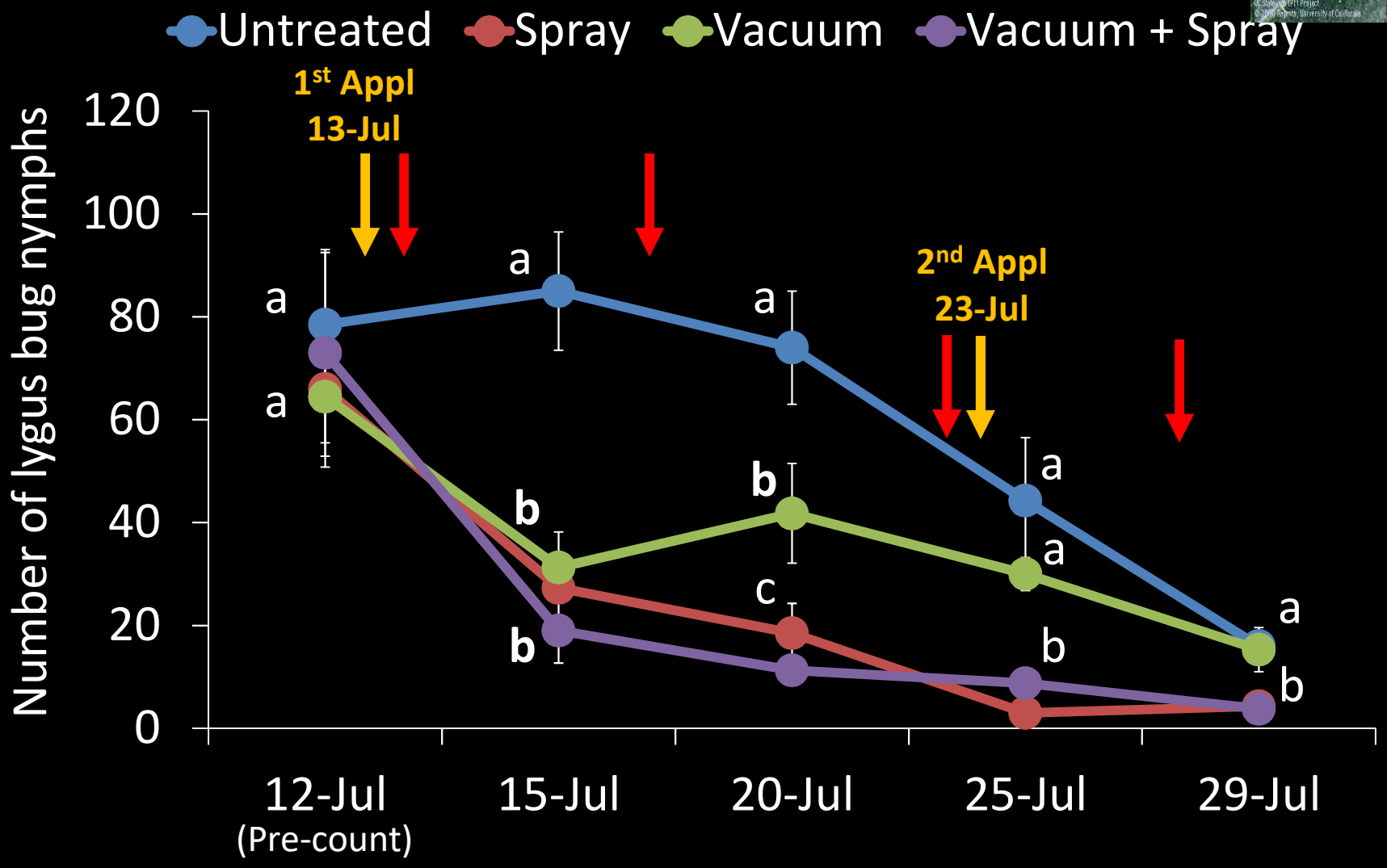
- Sampled 20 plants per plot
- Beat tray sampling: Five strikes per plant with the lid
- Sampling:
  - Pre-count
  - First application: 2 and 7 days
  - Second application 2, and 7 days
- 60 fruits randomly sampled from each plot at 21 day after second application



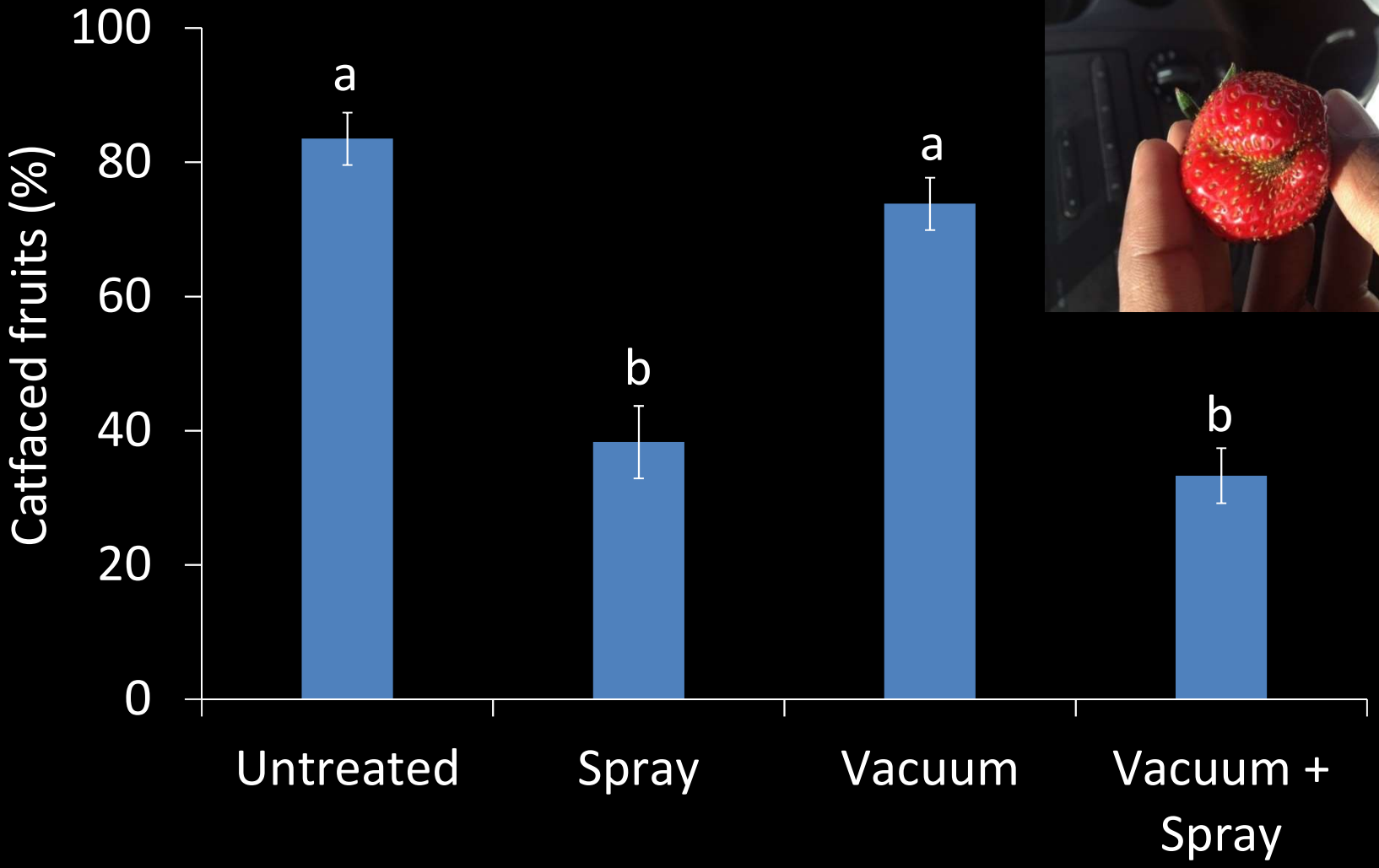
Adult lygus bug

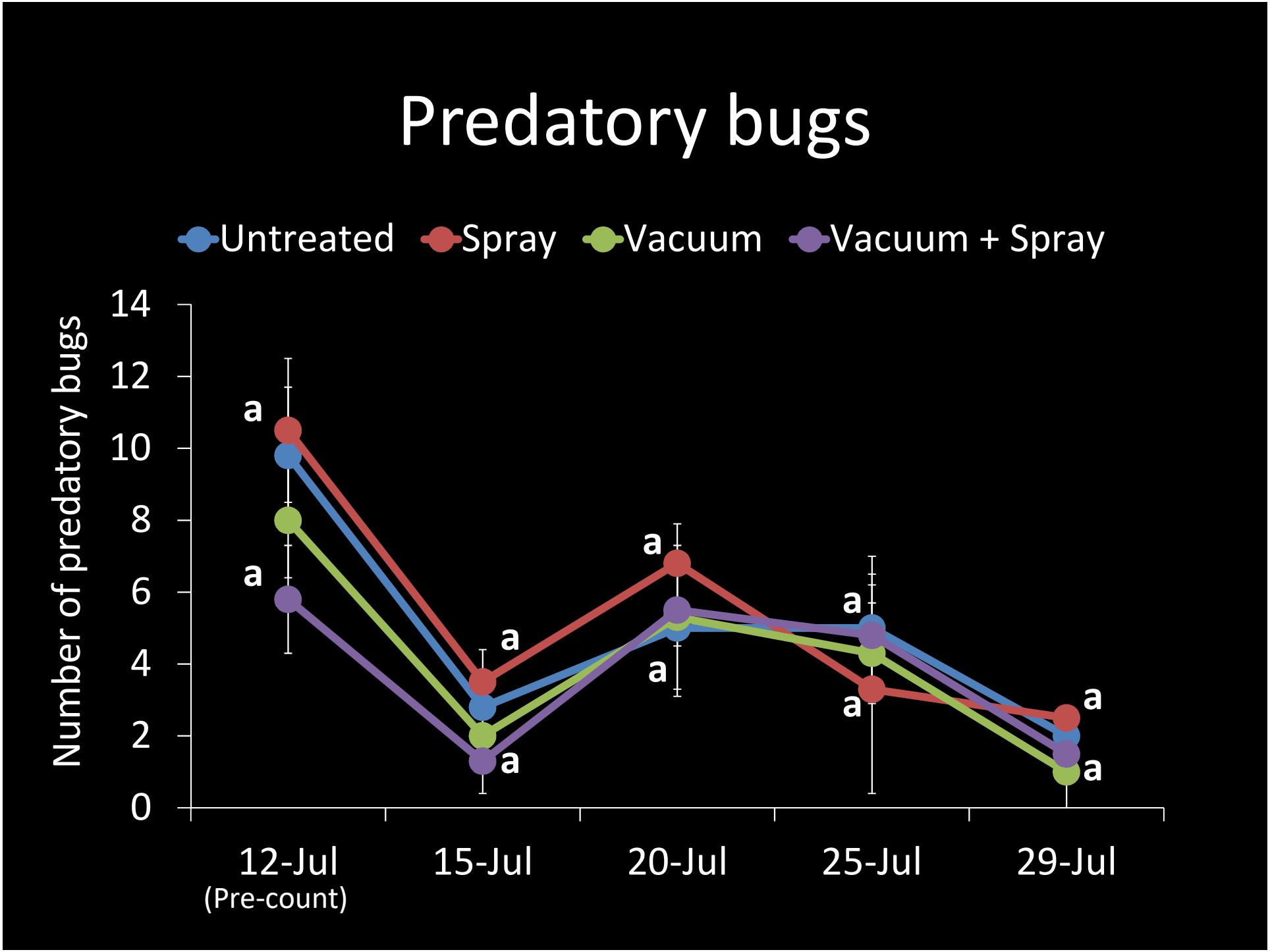


Lygus bug nymphs

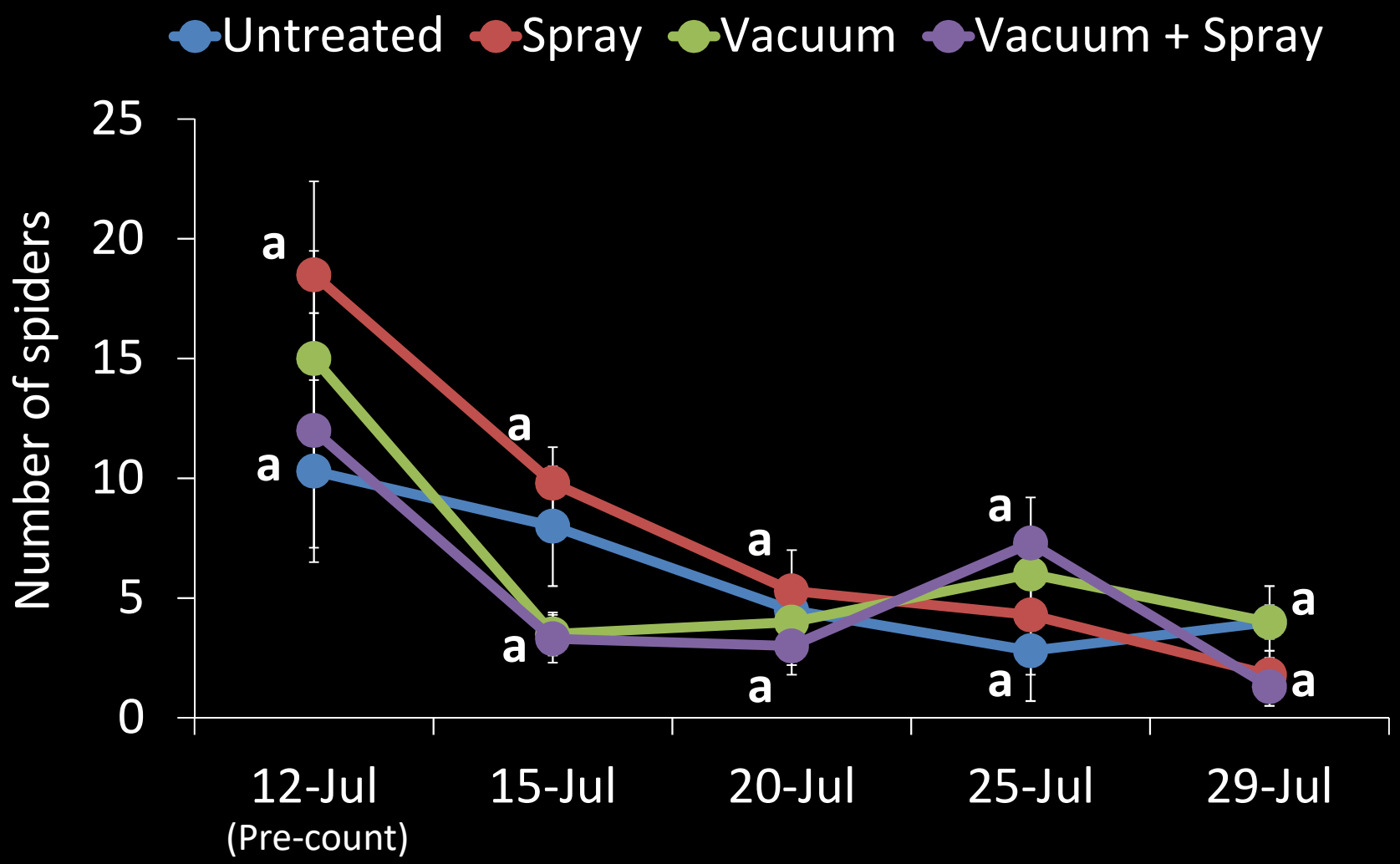


Catfaced strawberry fruits

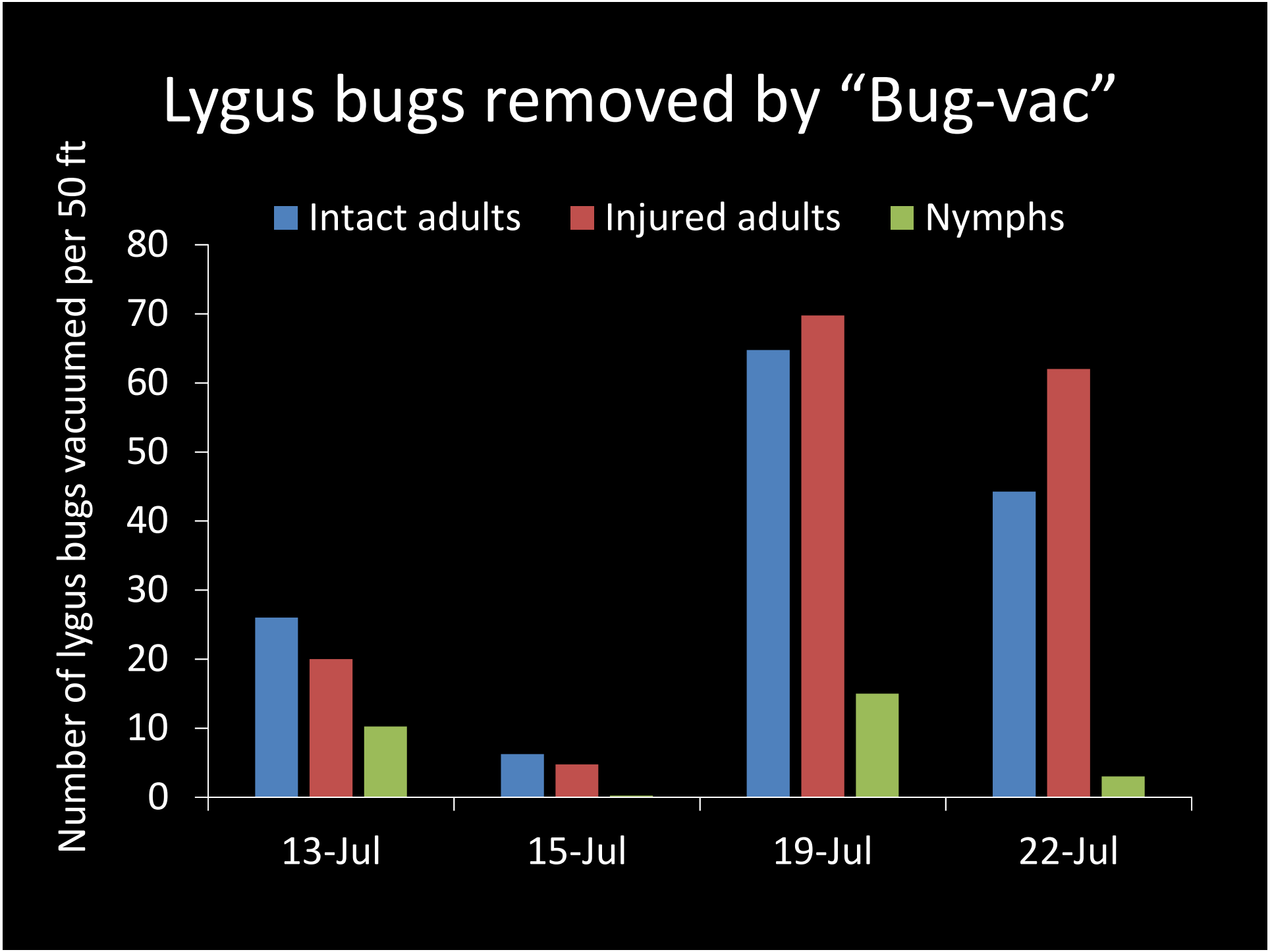



Predatory bugs
Untreated
Spray
Vacuum
Vacuum + Spray
Number of predatory bugs
14
12
10
8
6
4
2
0
a
a
a
a
a
a
a
a
a
a
12-Jul
(Pre-count)
15-Jul
20-Jul
25-Jul
29-Jul

Spiders


Untreated
Spray
Vacuum
Vacuum + Spray
Number of spiders
25
20
15
10
5
0
a
a
a
a
a
a
a
a
a
12-Jul
(Pre-count)
15-Jul
20-Jul
25-Jul
29-Jul


TORO


Lygus bugs removed by “Bug-vac”
Intact adults
Injured adults
Nymphs
Number of lygus bugs vacuumed per 50 ft
80
70
60
50
40
30
20
10
0
13-Jul
15-Jul
19-Jul
22-Jul

Utility of electrostatic spray

Treatment

Treatment	Water volume (gal per acre)	rpm	psi	Tractor speed (miles per hour)
Untreated	-	-	-	
Electrostatic Low	10	1700	5	4.3
Electrostatic Medium	20	1700	10	3.4
Electrostatic High	30	1700	15	2.4
Conventional	150	2000	140	2.4

Sequoia at 4.5 fl oz per acre was used in all the treatments
Dyne-Amic added to all the treatments at 0.25 v/v

Insecticide application

- Insecticides (Sequoia) applied using electrostatic sprayer and commercial tractor mounted sprayer
- Water volume varied
- Two insecticide applications
- Plot design: Randomized complete block design with 4 replications
- Plot size: 6 beds by 50 ft long

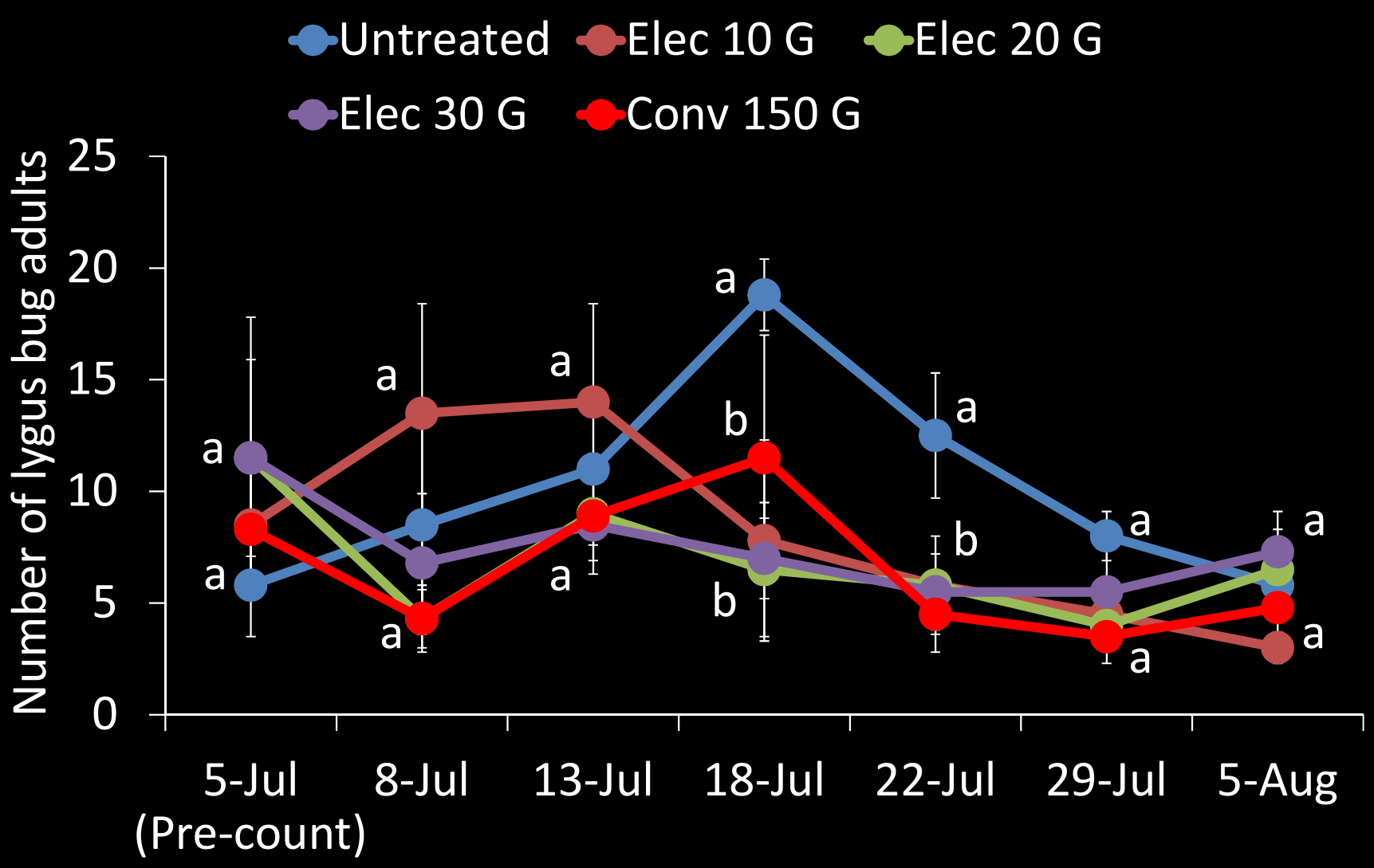

Electrostatic spray


Conventional spray

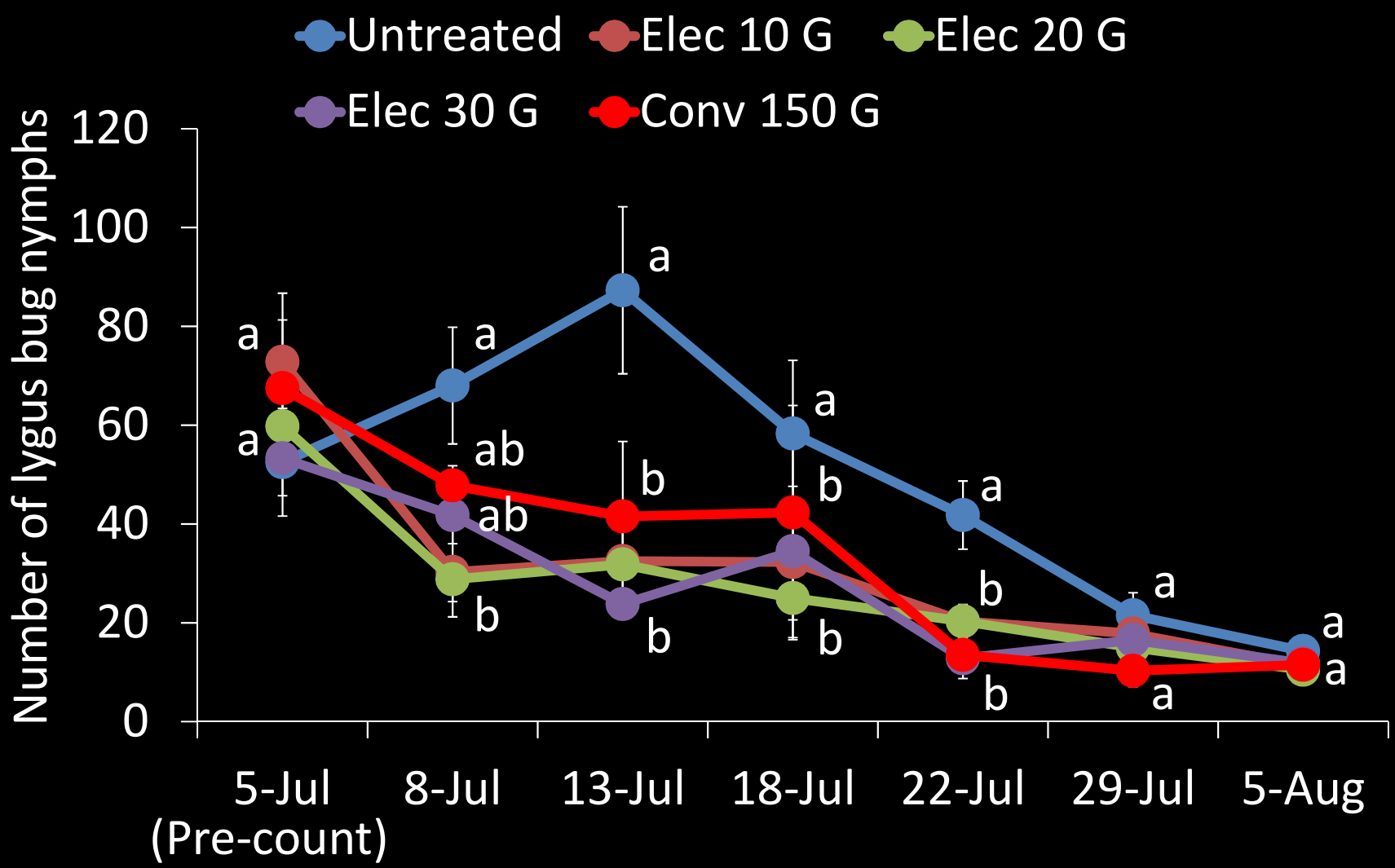
Evaluation

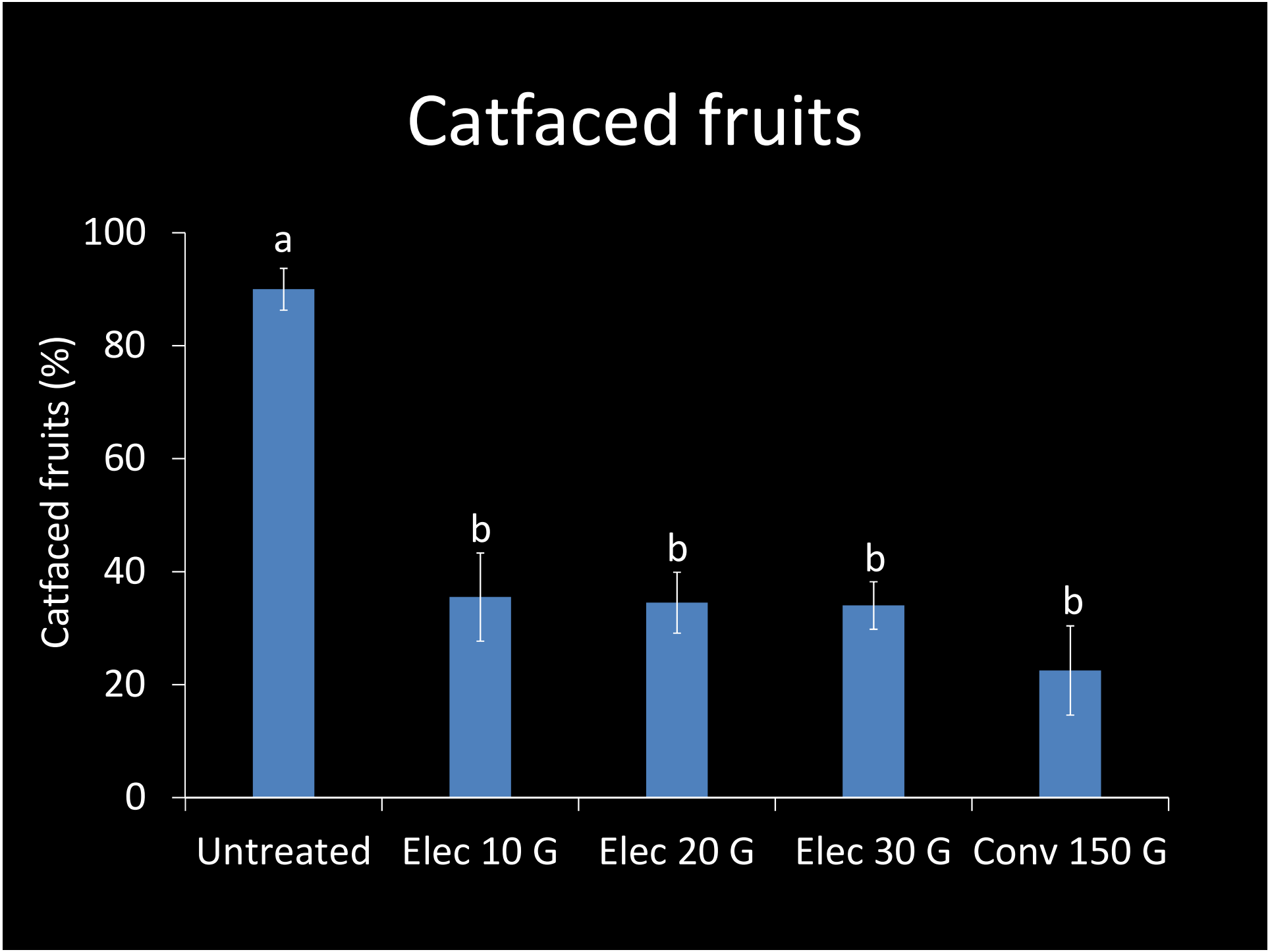
- Sampled 20 plants per plot
- Beat tray sampling: Five strikes per plant with the lid
- Sampling:
  - Pre-count
  - First application: 2 and 7 days
  - Second application 2, 7 14 and 21 days
- 60 fruits randomly sampled from each plot at 21st day after second application

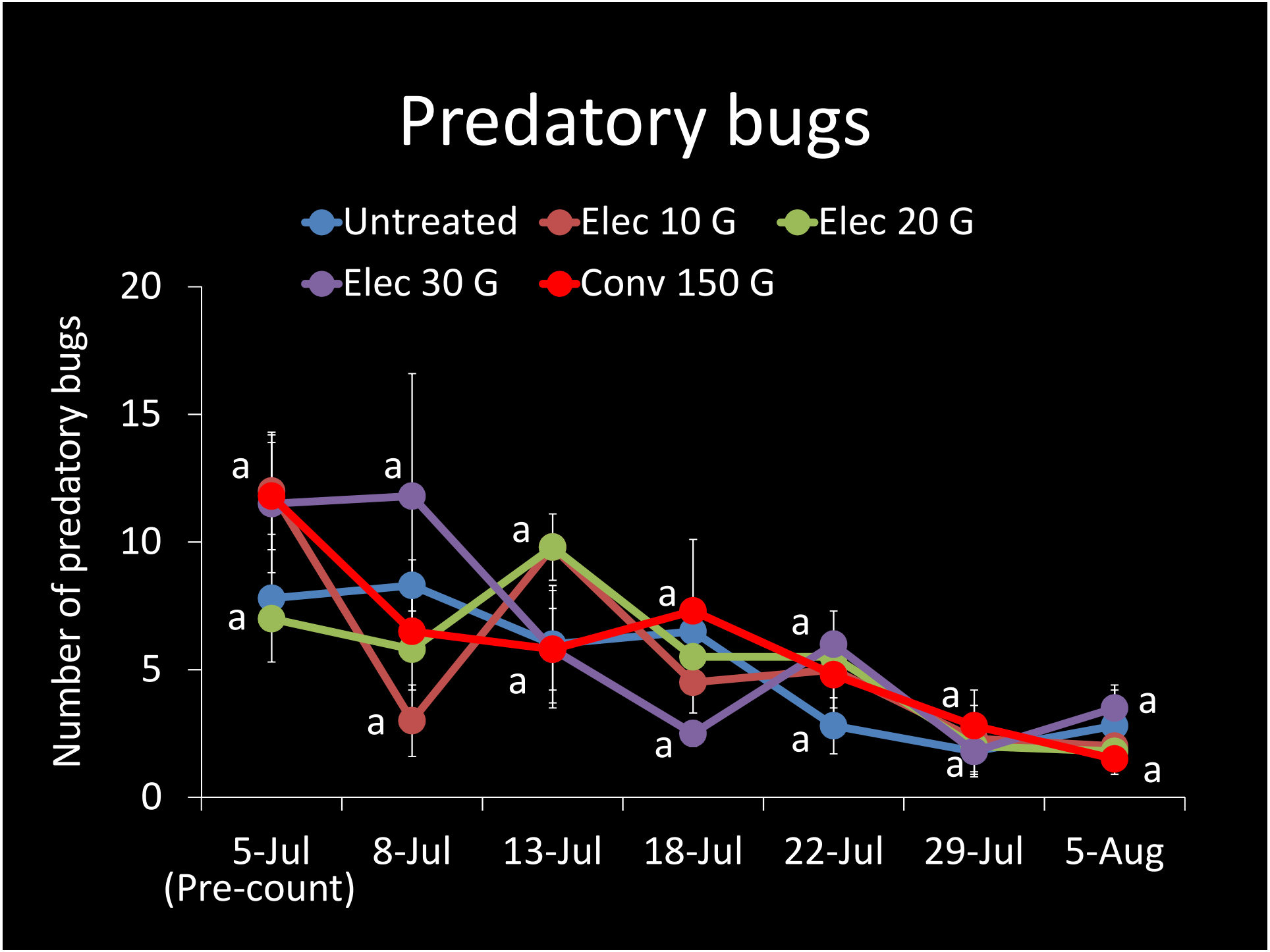
Lygus bug adults

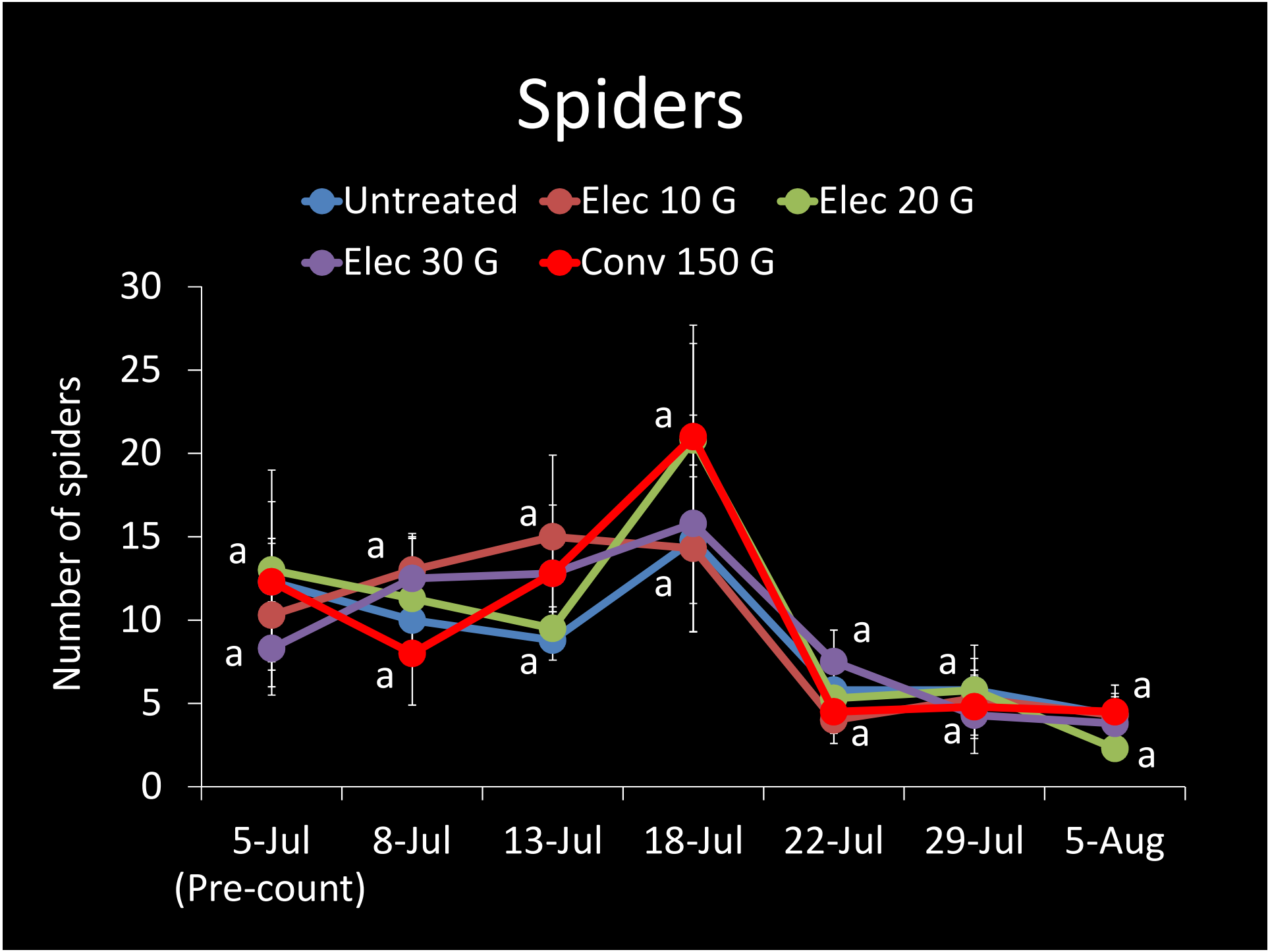


Lygus bug nymphs




Catfaced fruits
Catfaced fruits (%)
100
80
60
40
20
0
a
b
b
b
b
Untreated
Elec 10 G
Elec 20 G
Elec 30 G
Conv 150 G


Predatory bugs
Untreated
Elec 10 G
Elec 20 G
Elec 30 G
Conv 150 G
Number of predatory bugs
20
15
10
5
0
a
5-Jul
(Pre-count)
8-Jul
13-Jul
18-Jul
22-Jul
29-Jul
5-Aug

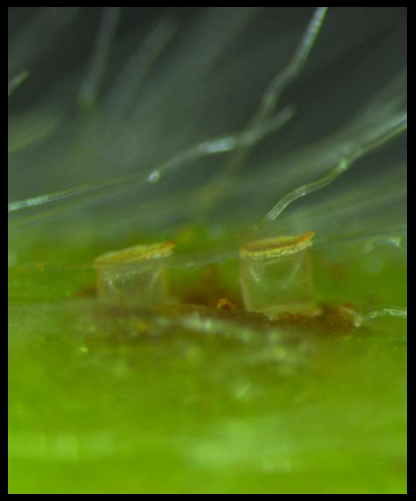

Spiders
Untreated
Elec 10 G
Elec 20 G
Elec 30 G
Conv 150 G
Number of spiders
30
25
20
15
10
5
0
a
5-Jul
(Pre-count)
8-Jul
13-Jul
18-Jul
22-Jul
29-Jul
5-Aug

Summary

- All the insecticides including Rimon, Sequoia, Sivanto, Beleaf and Avaunt were effective on lygus bug
- The effect of Sivanto was not long lasting
- Avaunt was effective against lygus and will be a good candidate for registration on strawberry
- Pyrethroid insecticides appeared to have shown negative effects on beneficials

Summary

- Vacuum (bug vac) did not provide a sustained lygus control
- Combining insecticide and vacuum did not provide any added advantage for lygus control and in reducing catfaced fruits
- All water volumes used in electrostatic sprayer appear to suppress lygus bug and reduce catfaced fruits
- Efficacy of Sequoia applied using electrostatic sprayer was comparable to conventional sprayer against lygus control




Thank you!