

Yet Another Thrips Talk…

An Intermountain Perspective

Part III

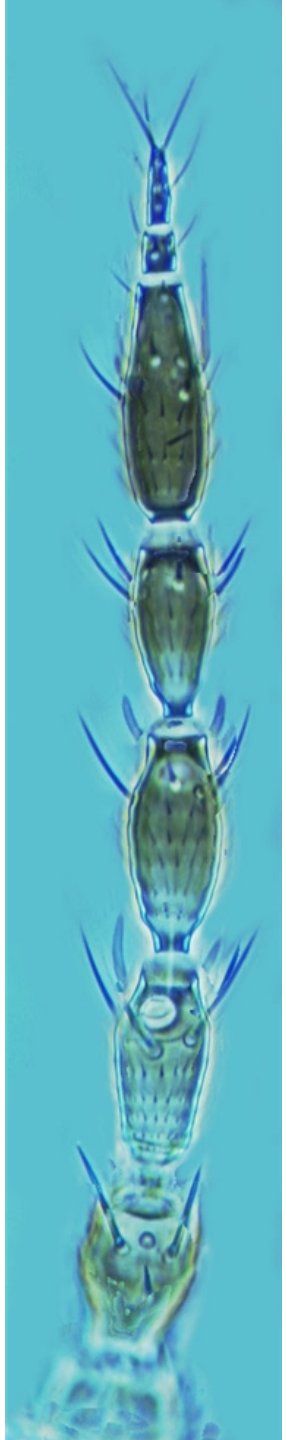
Steve Orloff, Farm Advisor, Siskiyou County
Larry Godfrey, Entomology Specialist, UCD
Rob Wilson, IREC Director

Funded by CAGORAB

WFT

Frankliniella occidentalis

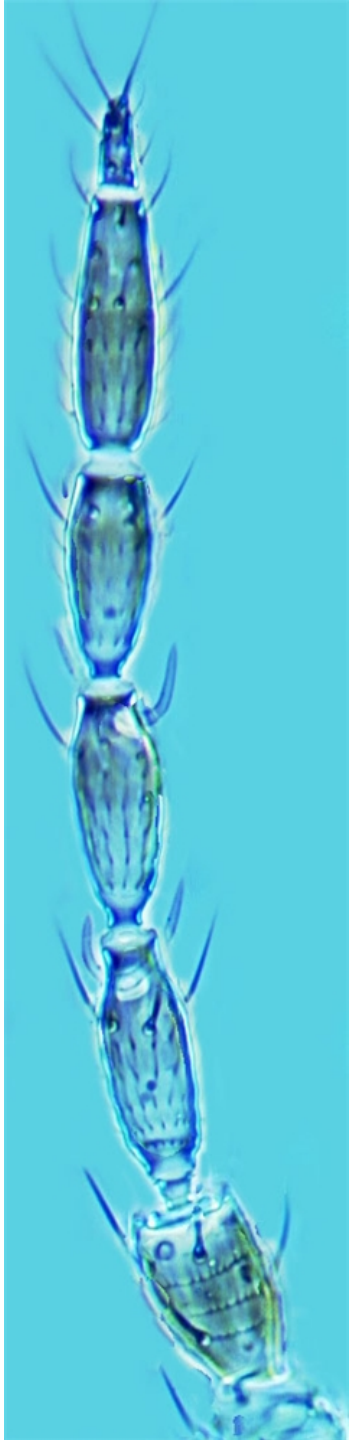
Reproduces sexually, males and females common



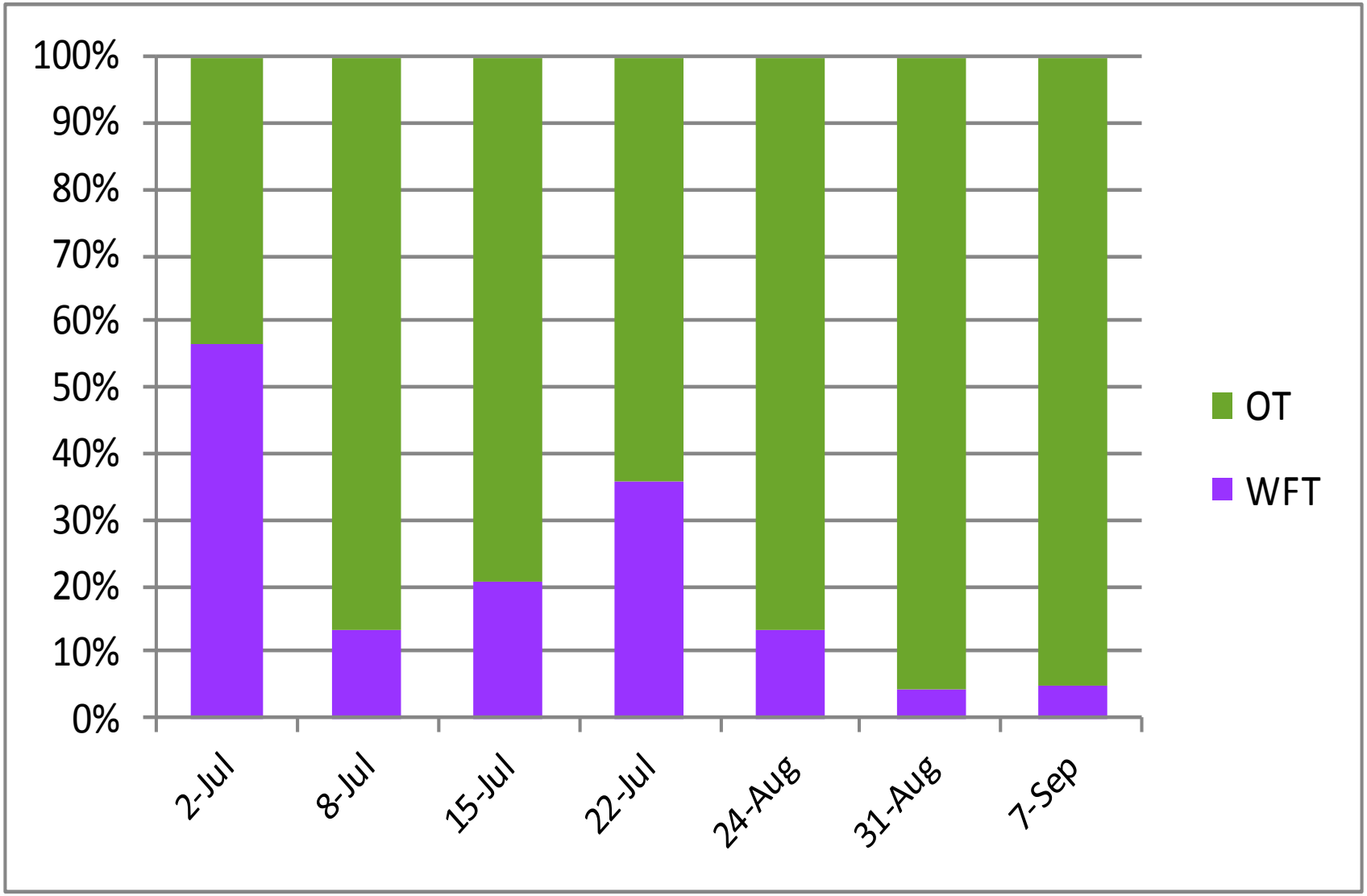
Onion Thrips

Thrips tabaci

Asexual reproduction by females (parthenogenesis)



Relative Percentage of Onion Thrips vs. Western Flower Thrips 2010



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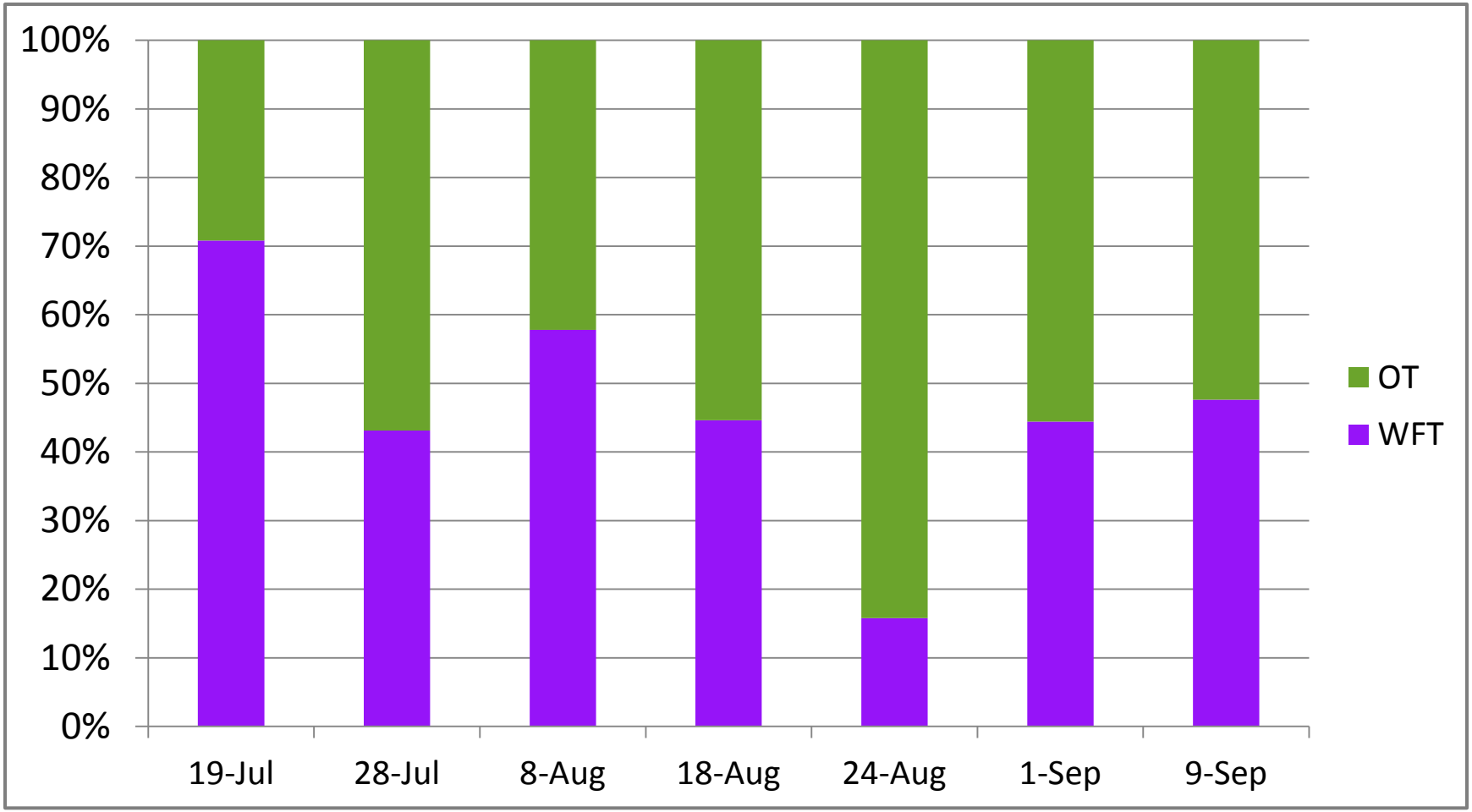

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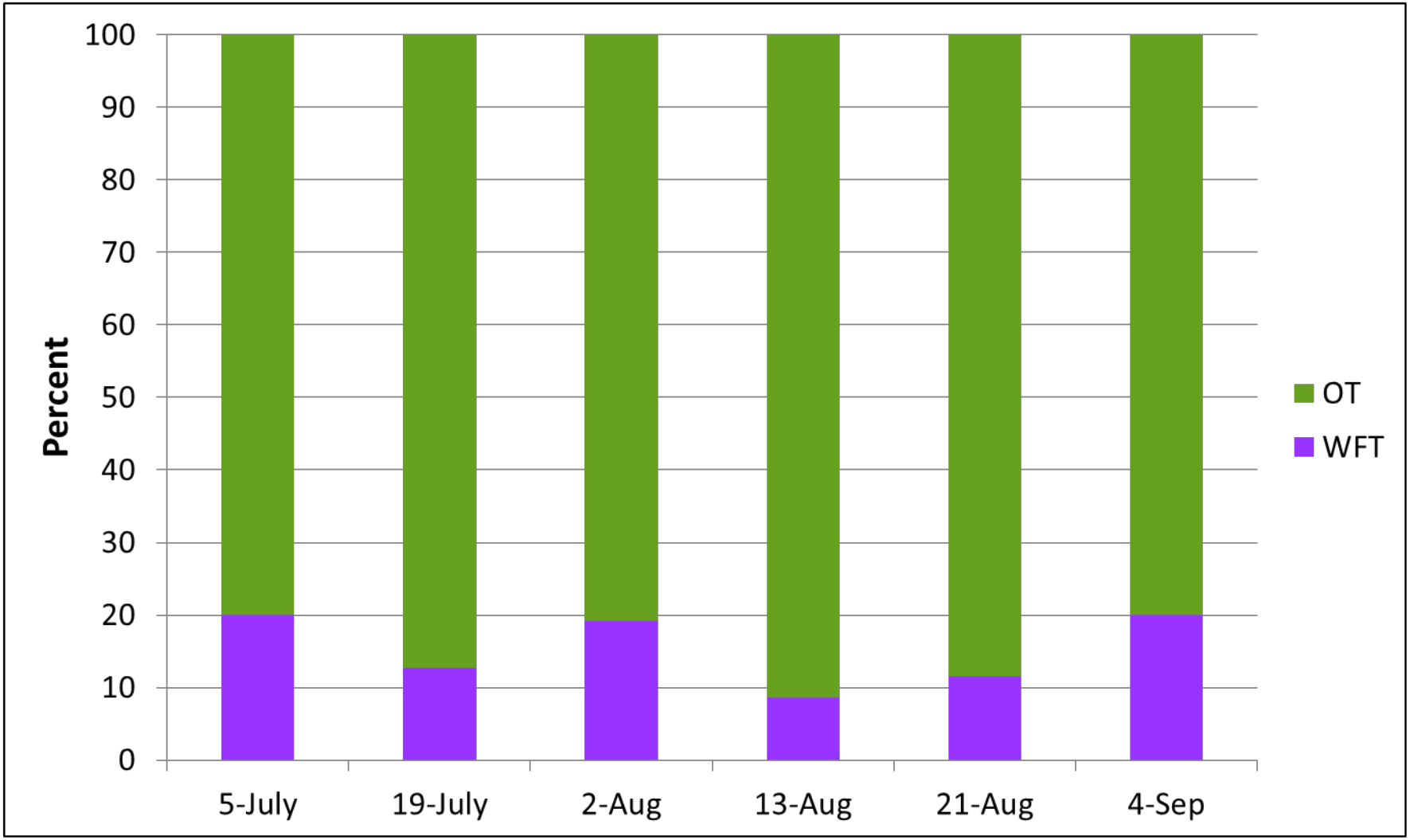
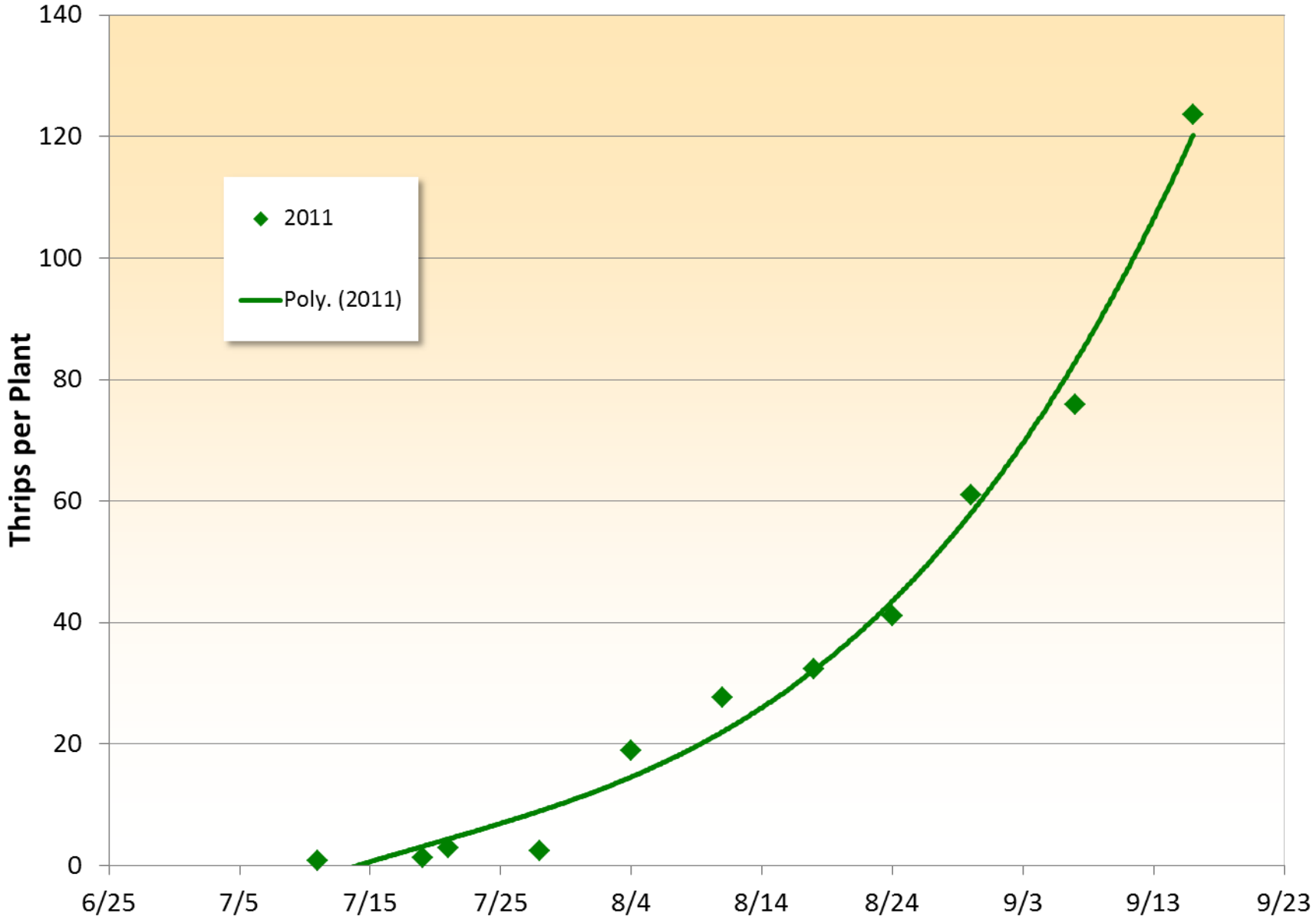


Thrips Population Over the Growing Season



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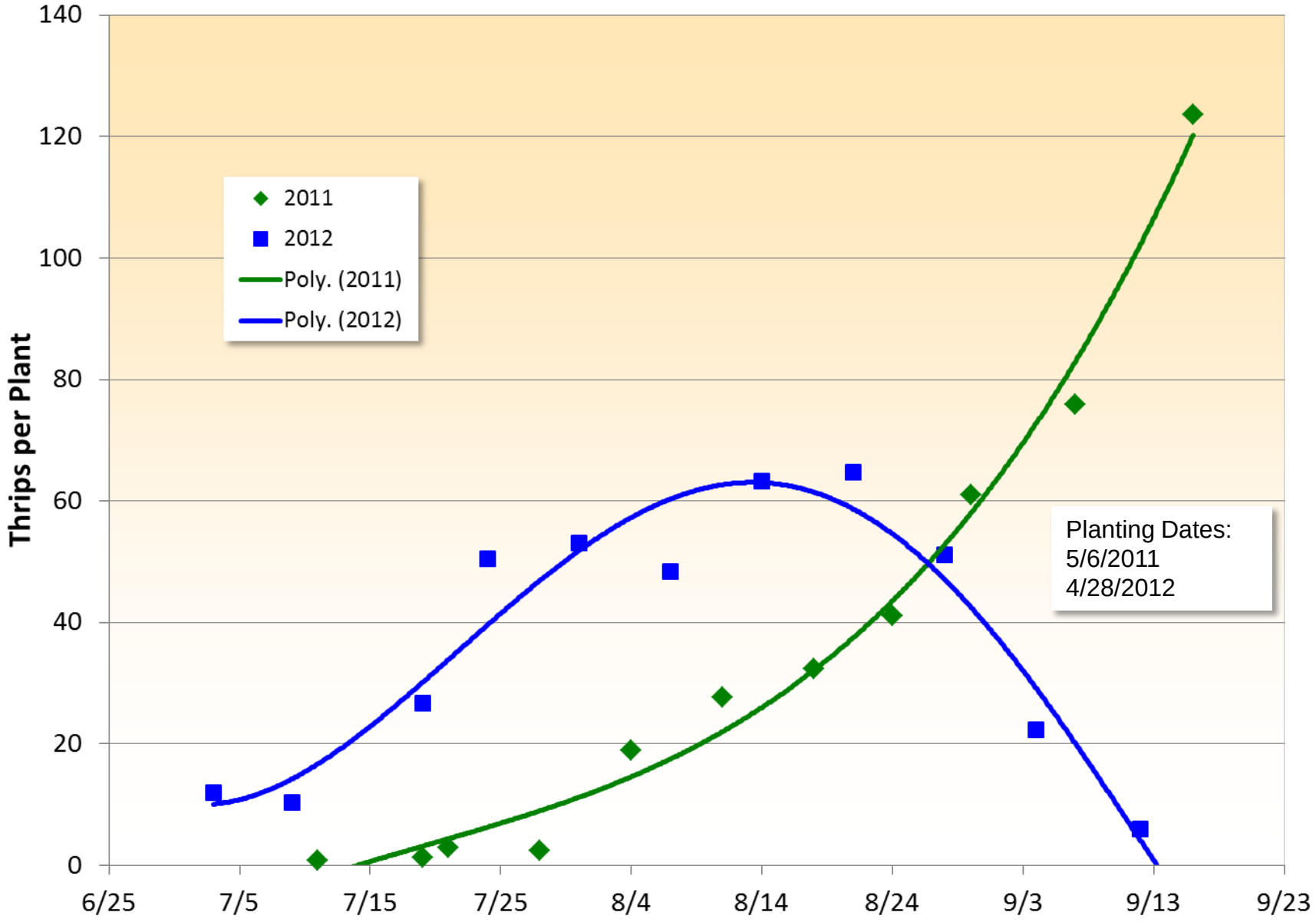
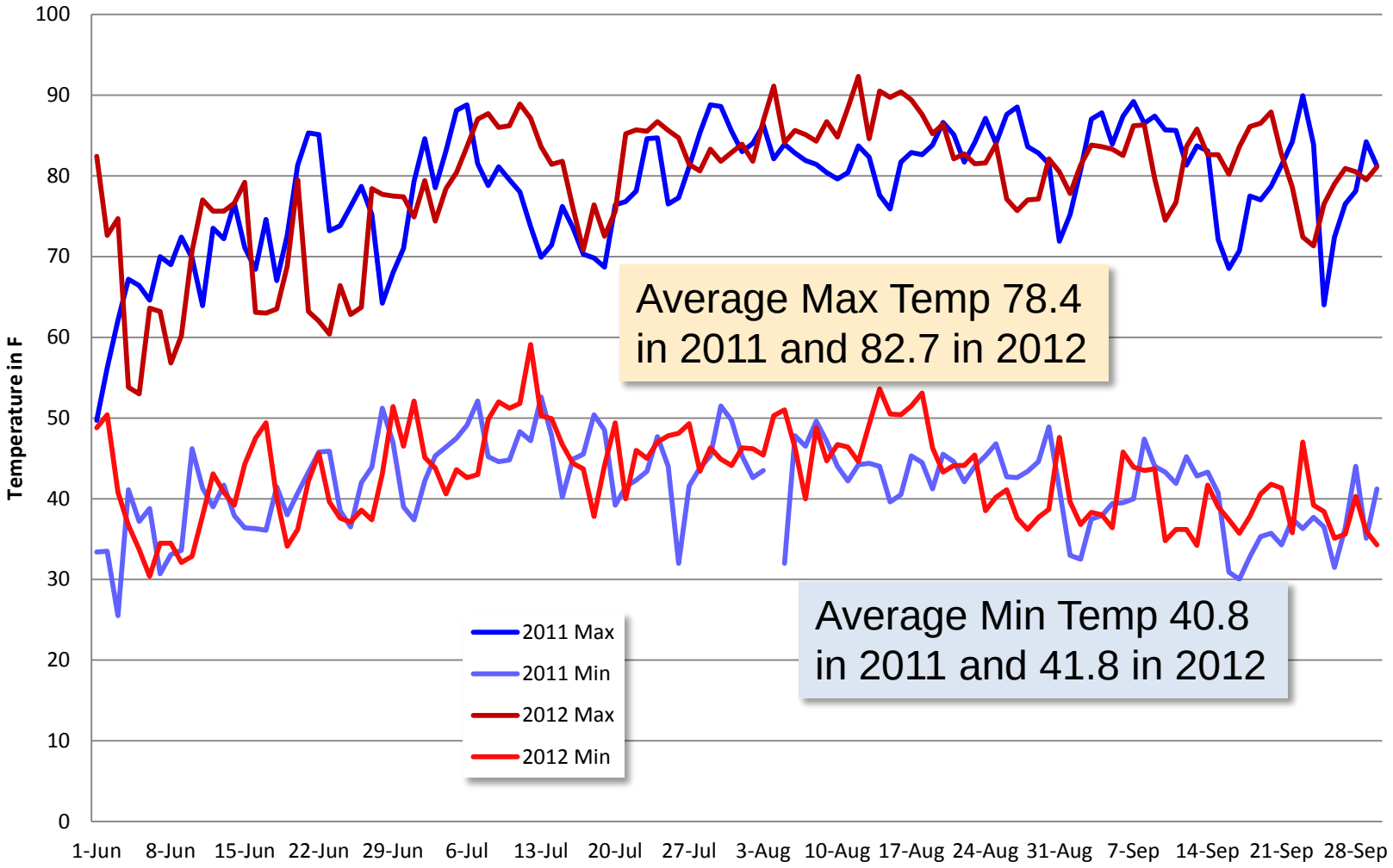


2011 vs. 2012 Max and Min Daily Temperatures



Objectives

- Compare effectiveness of a range of insecticides
- Evaluate different strategies for thrips management over the season to compare number of treatments, timing, and different insecticides sequences.
- Determine effect of different thrips populations on onion yield.

Insecticide Comparison Trial

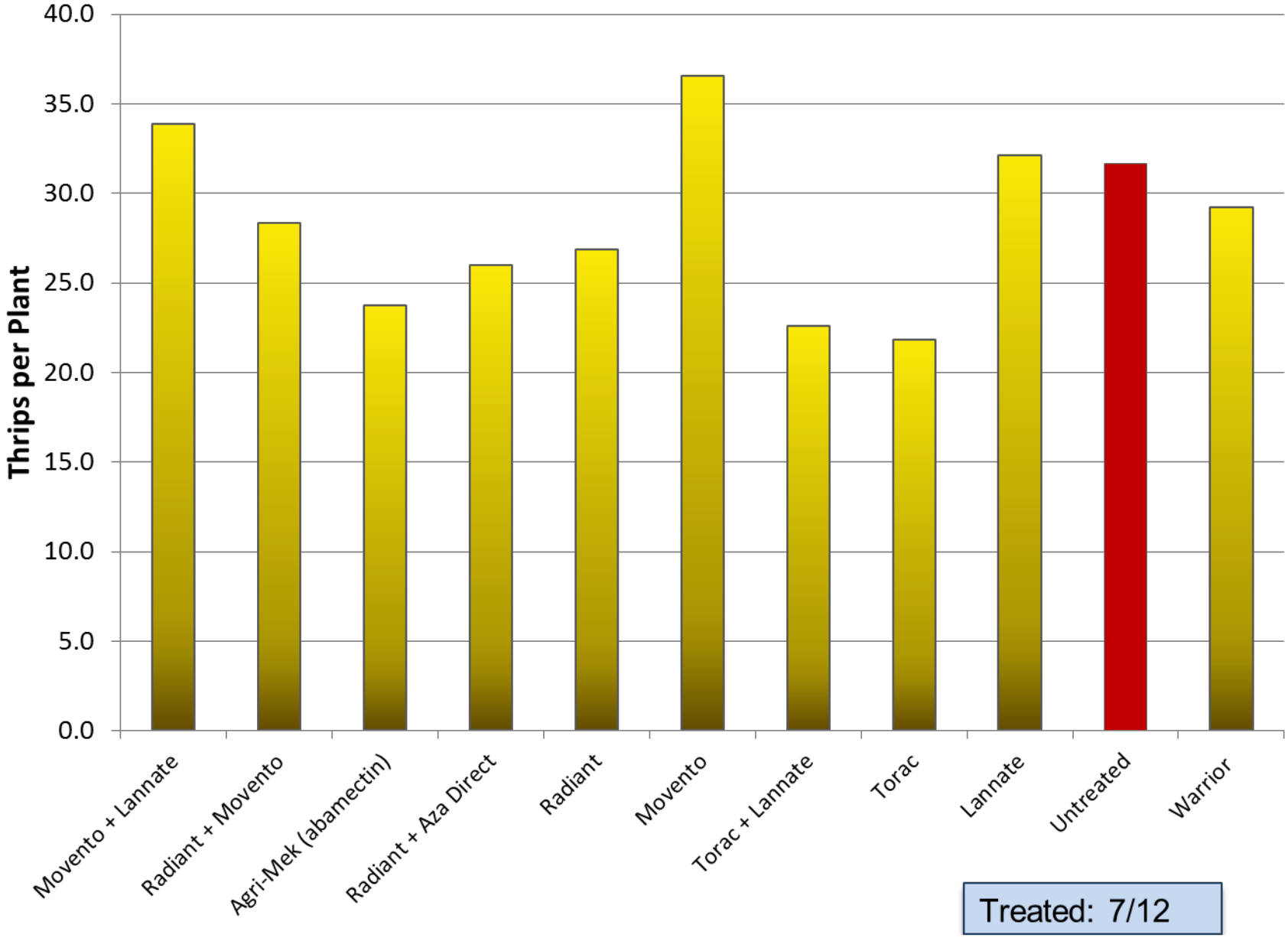
Season-Long Thrips Strategy

Insecticides Evaluated 2012

Insecticide	Rate/A
Warrior	1.92 oz
Lannate	3 pt
Radiant	8 oz
Radiant + Aza Direct	8 oz + 12 oz
Movento	5 oz
Lannate + Movento	5 oz + 3 pt
Agri-Mek	16 oz
Radiant + Movento	8 oz + 5 oz
Torac	24 oz
Torac + Lannate	24 oz + 3 pt

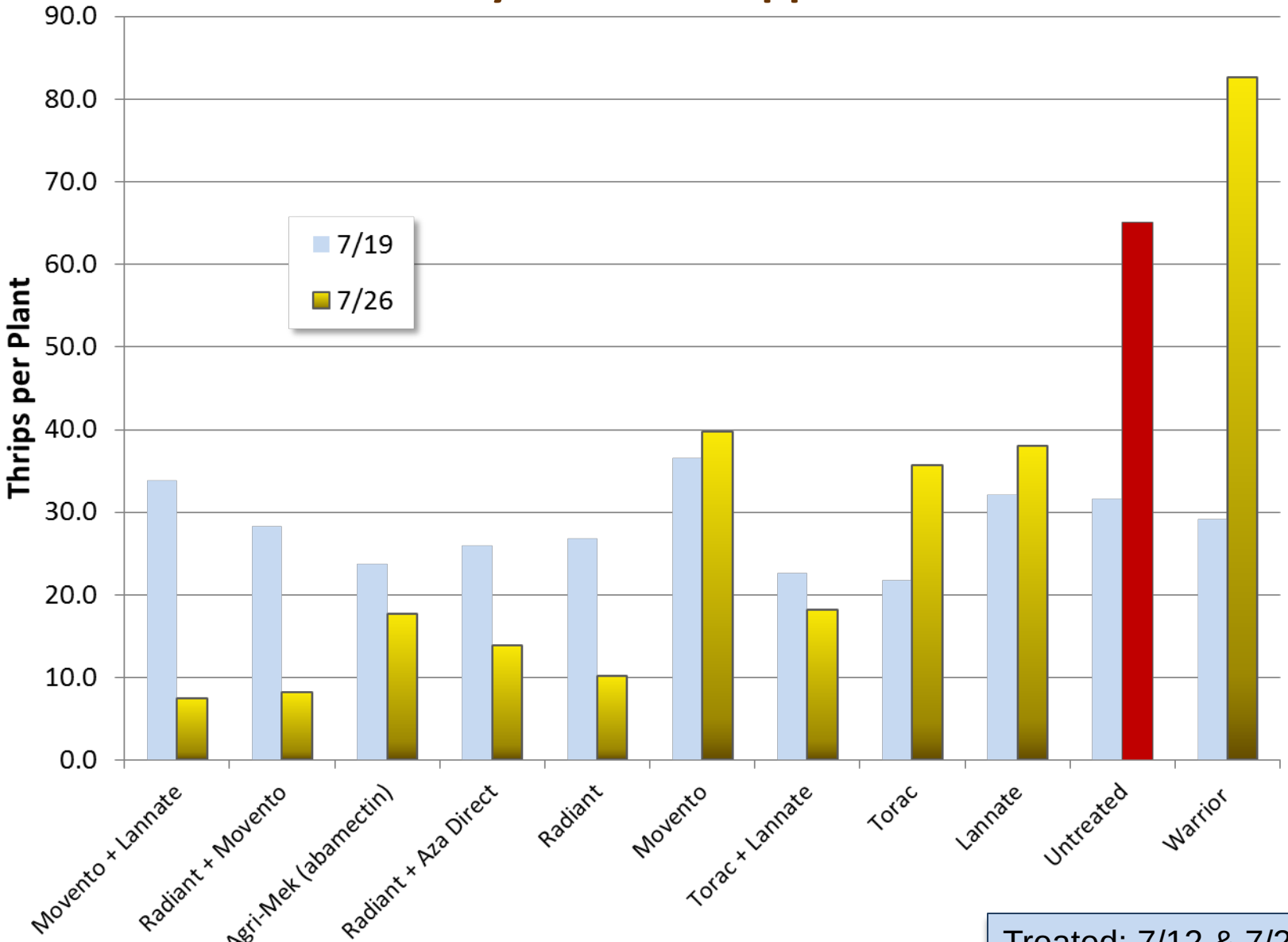
Insecticide Treatment Effects on Thrips Population

7 Days after 1st Application



Insecticide Treatment Effects on Thrips Population

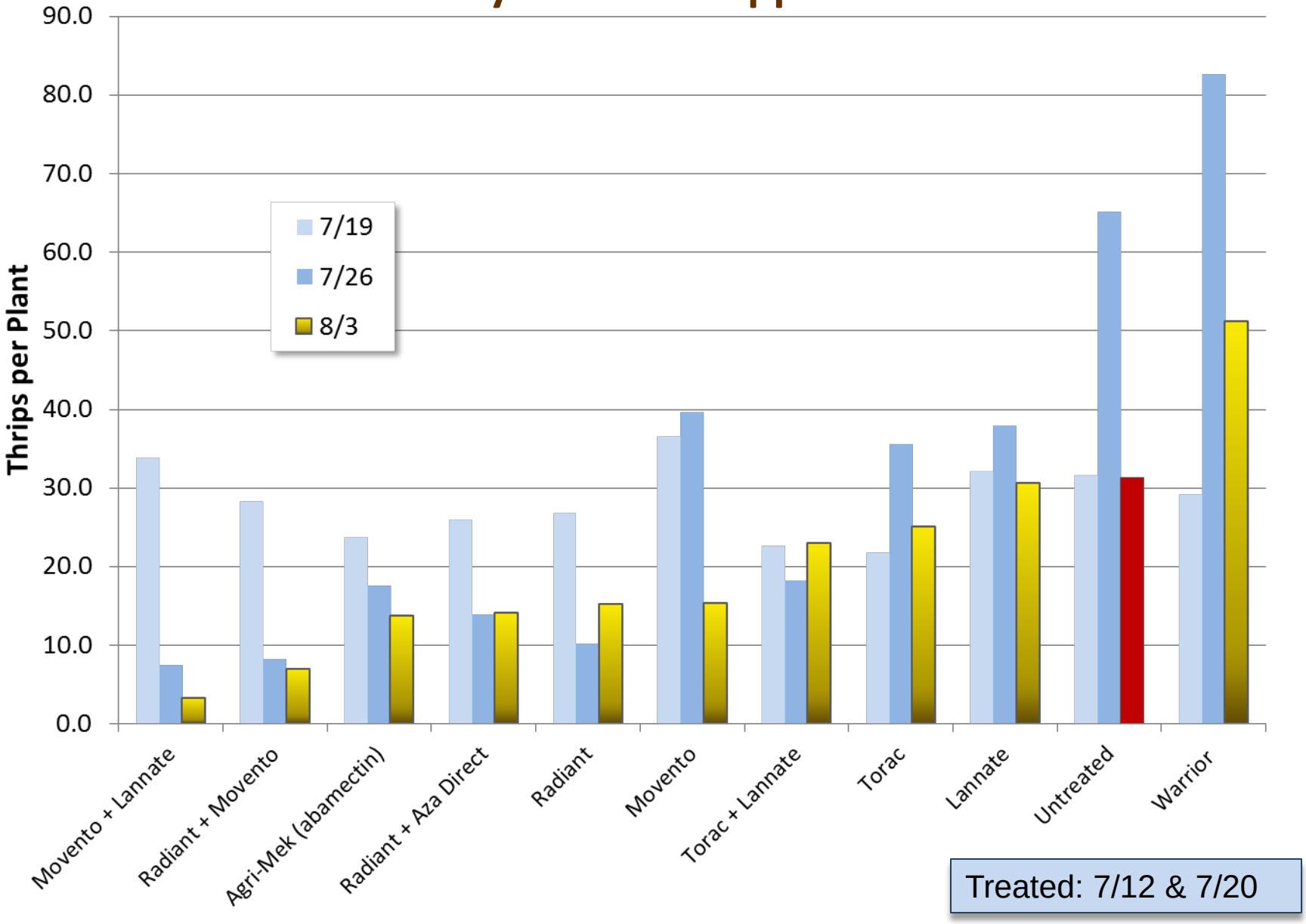
6 Days after 2nd Application



Treated: 7/12 & 7/20

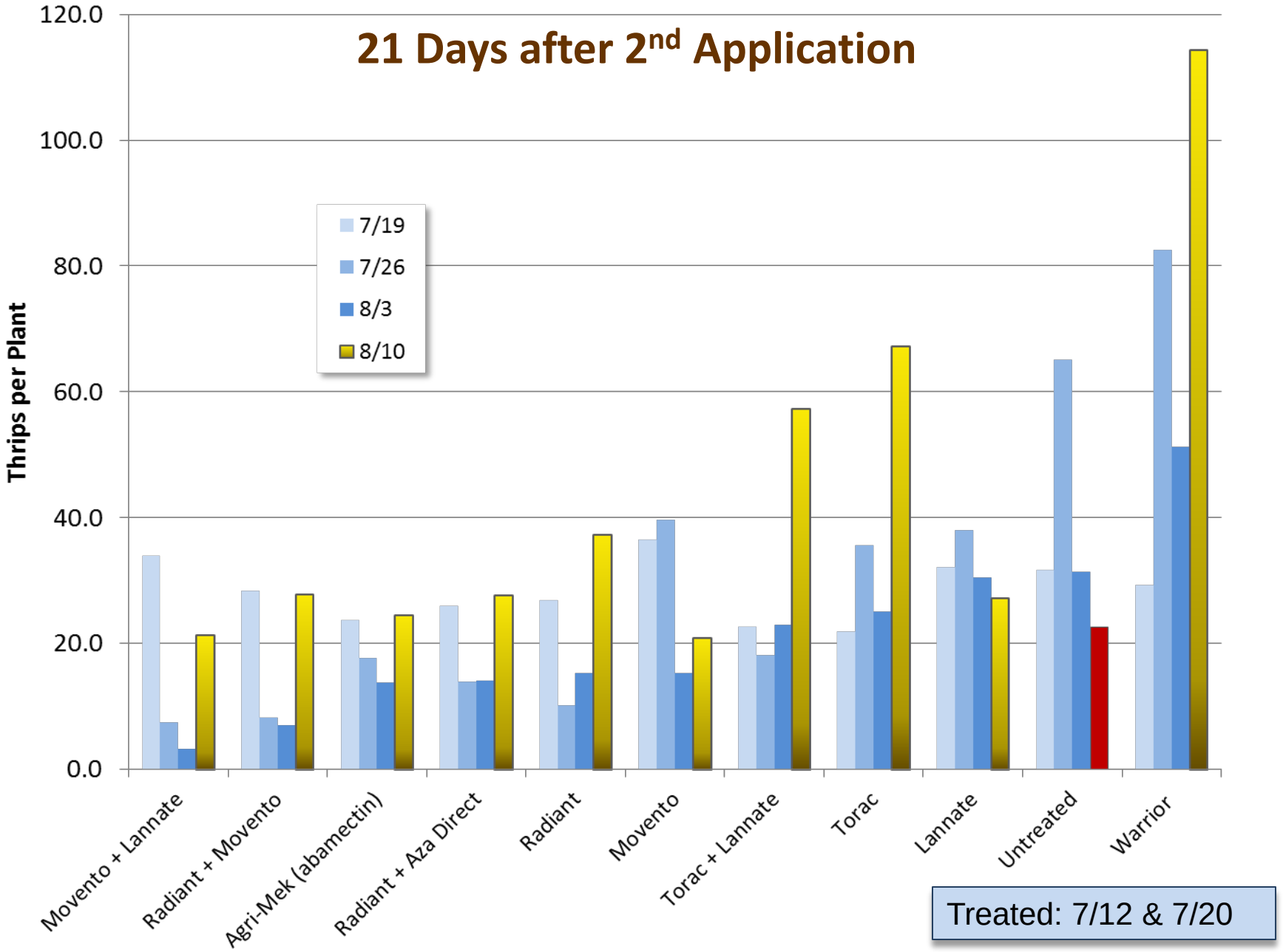
Insecticide Treatment Effects on Thrips Population

14 Days after 2nd Application



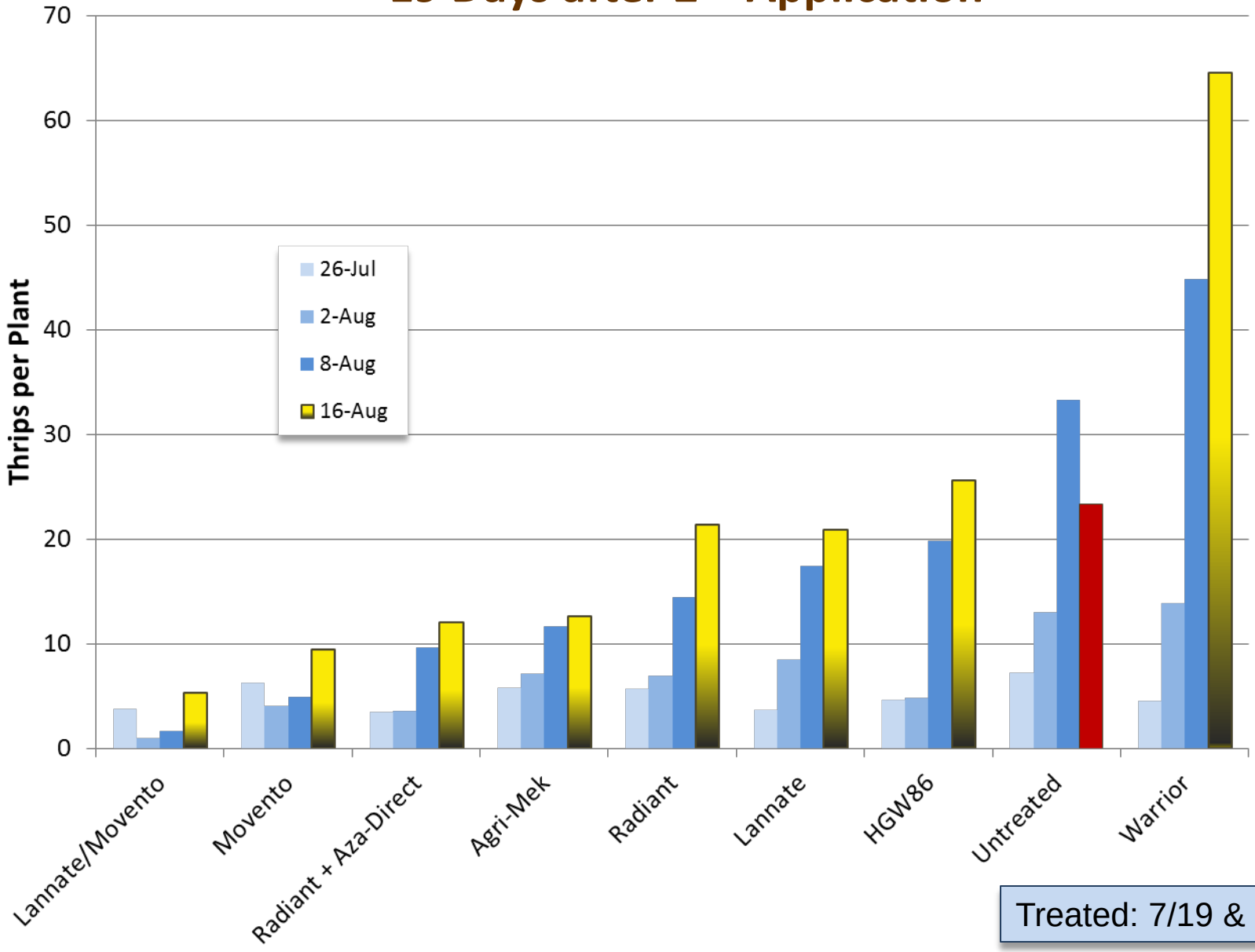
Treated: 7/12 & 7/20

Insecticide Treatment Effects on Thrips Population



Insecticide Treatment Effects on Thrips Population

19 Days after 2nd Application



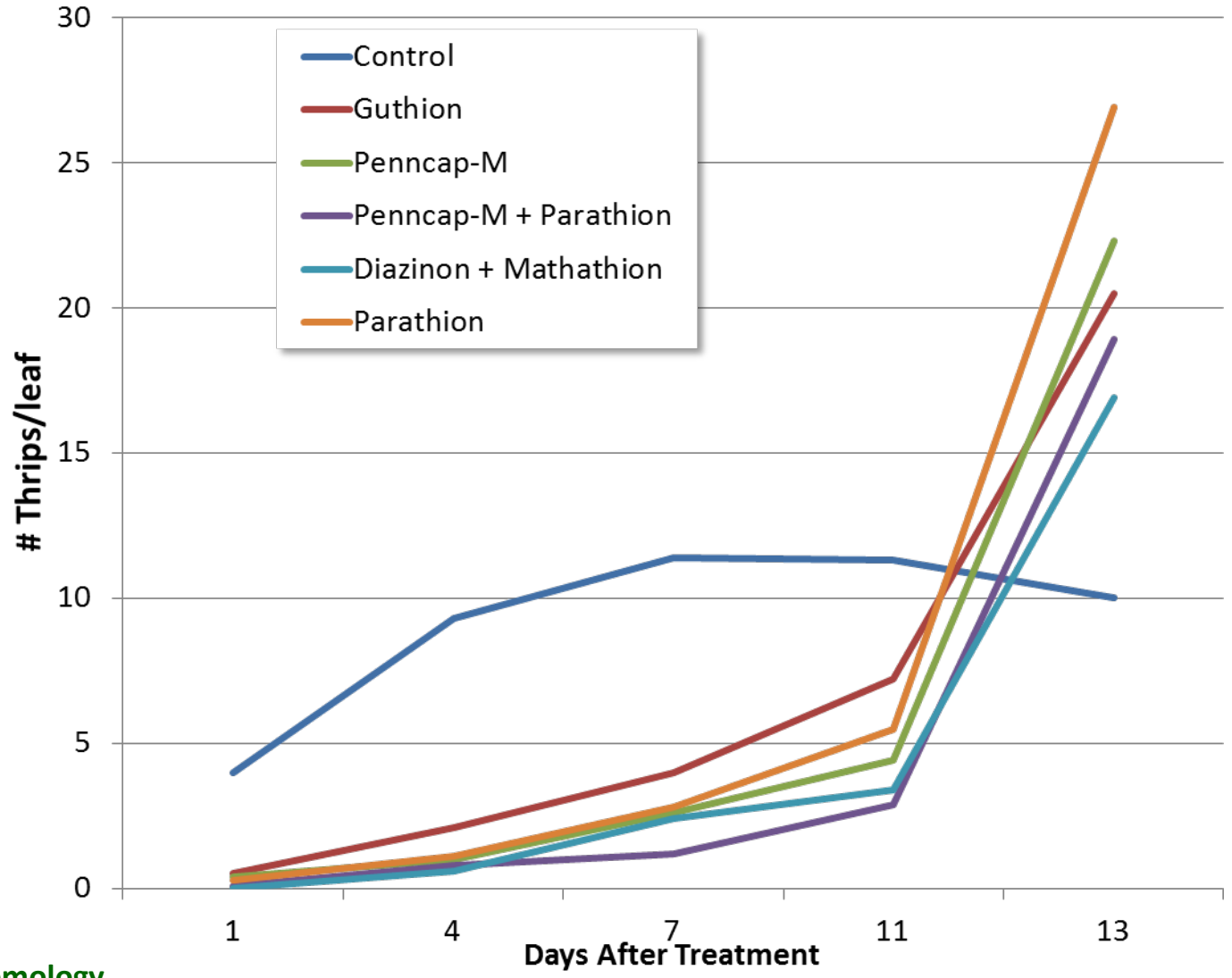
Treated: 7/19 & 7/28

Causes for Increased Thrips Population following Applications of Warrior

- Effect on beneficial insects
- ***Hormoligosis***: sublethal dose stresses the insect and triggers a response to produce more offspring.

Thrips Control in Fresh Market Onions

Lancaster 1986



Cowboy entomology

Insecticide Sequence

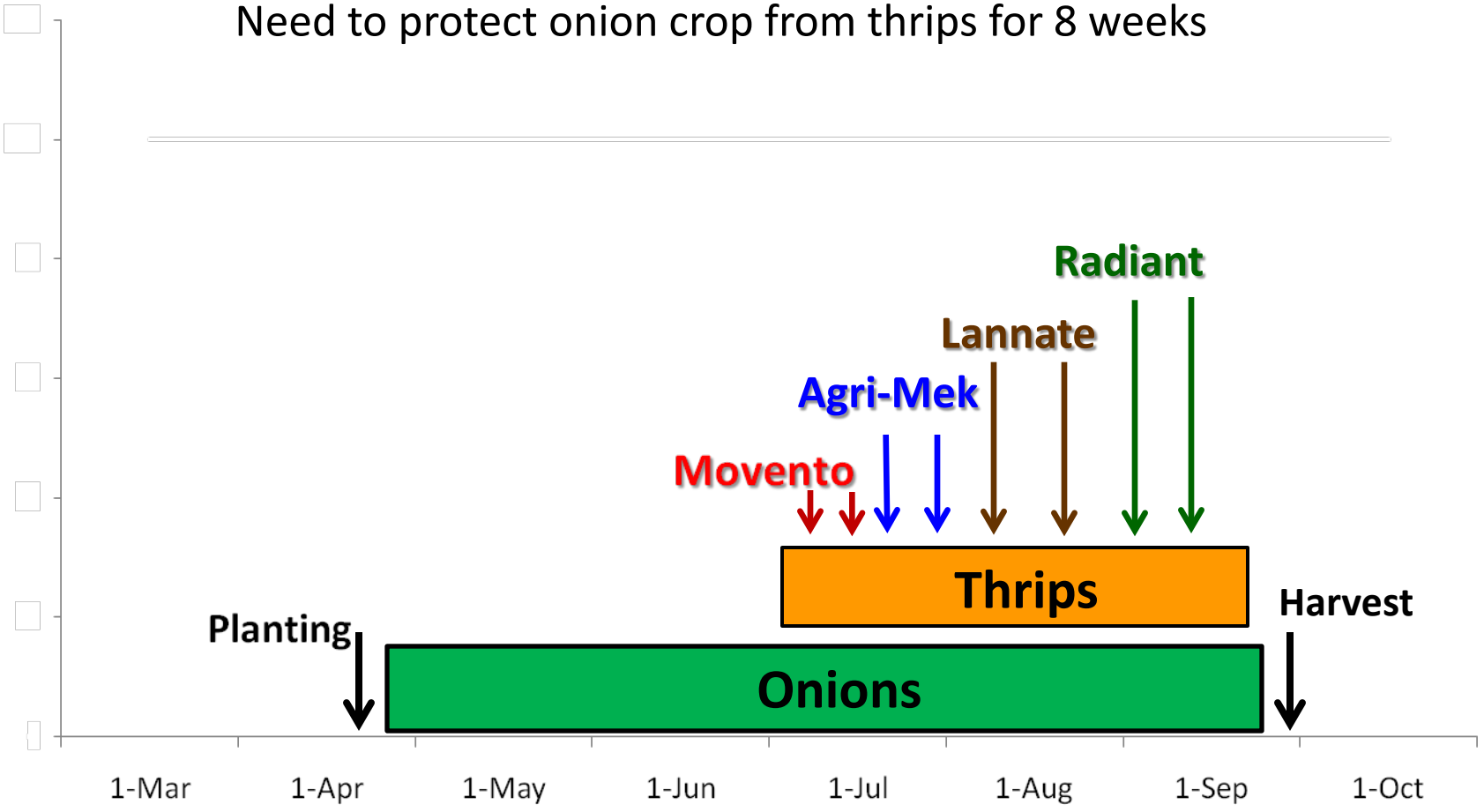
Proposed by Brain Nault Professor, Dept. of Entomology Cornell University

- Product should be used consecutively
  - Reduces the number of generations exposed to same product
  - Thrips can complete the life cycle in 14 to 30 days. Typically 2 – 3 weeks (even shorter high temperatures)
- Movento not effective on adults so should be used early in the season when adult populations are low.
- Radiant can be used later when populations are high
- Do not apply same insecticide more than twice

Example Insecticide Sequence

Proposed by Brain Nault Professor, Dept. of Entomology Cornell University

Need to protect onion crop from thrips for 8 weeks



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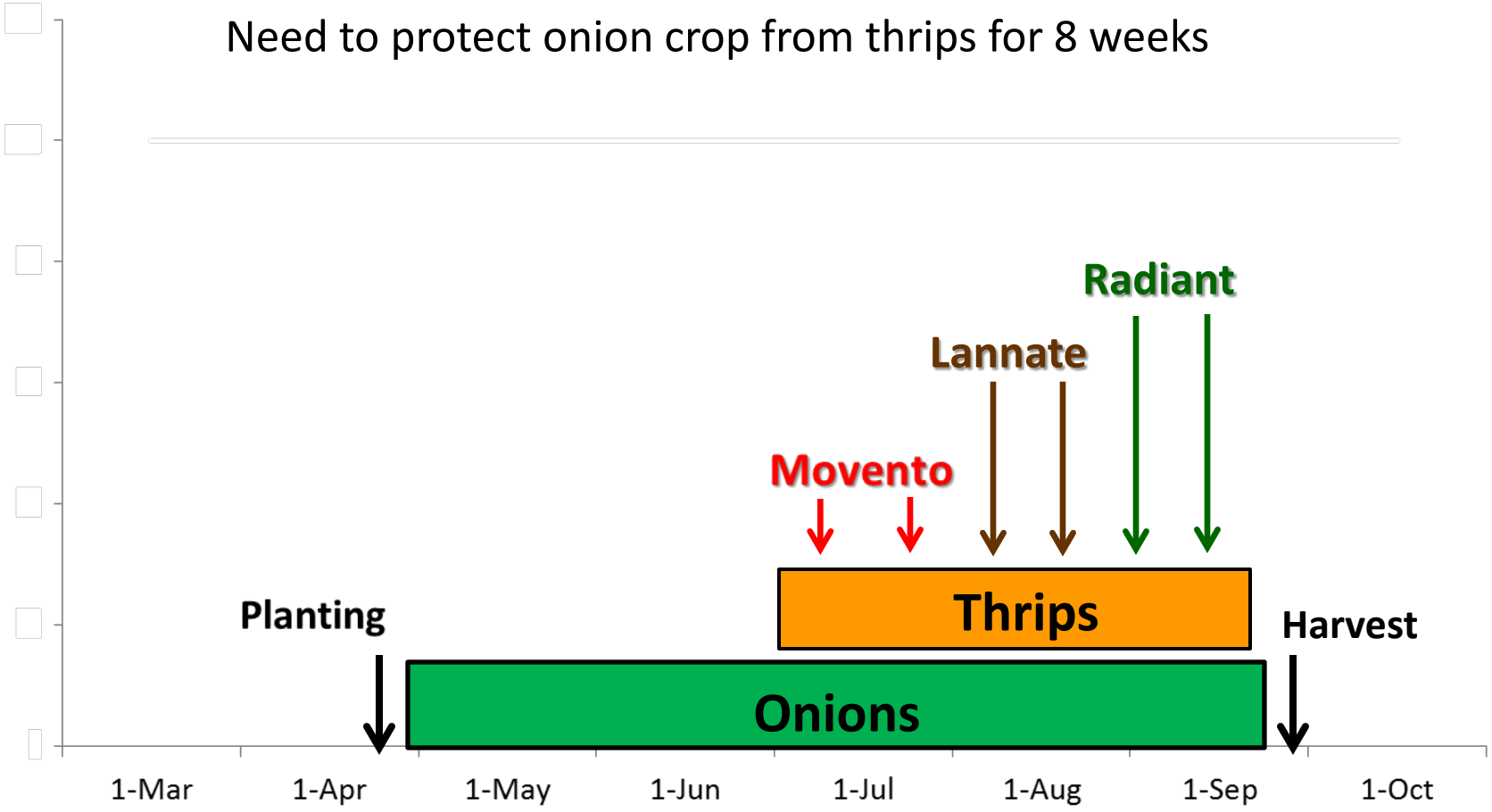


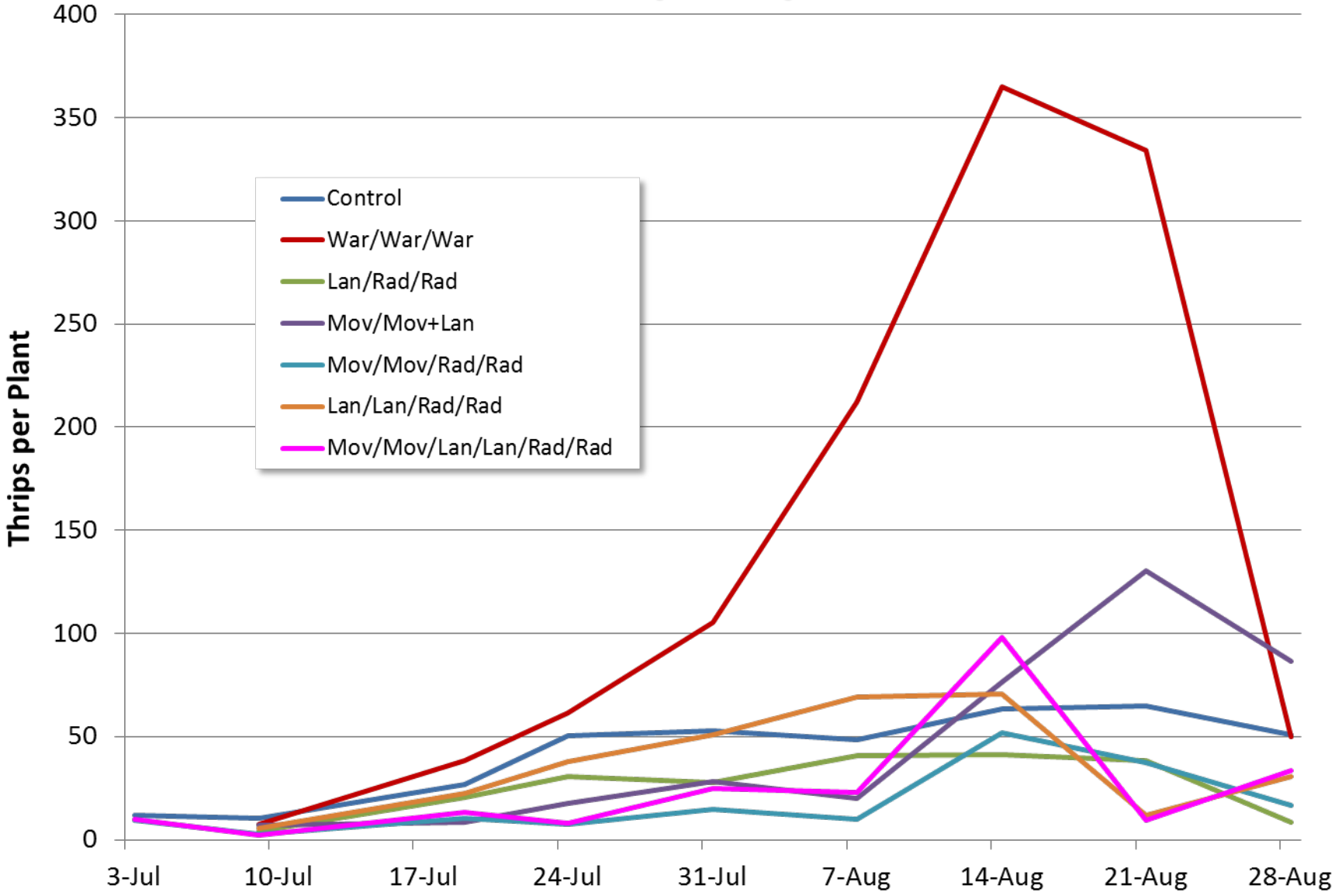
Season-Long Thrips Management

Treatment Strategies 2012

1st Application	2nd Application	3rd Application	4th Application	5th Application	6th Application
Untreated					
Warrior *7/3*	Warrior *7/20*	Warrior *8/10*			
Lannate *7/3*	Radiant *7/20*	Radiant *8/10*			
Movento *7/3*	Mov/Lan *7/20*				
Movento *6/26*	Movento *7/9*	Radiant *7/25*	Radiant *8/15*		
Lannate *7/3*	Lannate *7/20*	Radiant *8/7*	Radiant *8/31*		
Movento *6/26*	Movento *7/9*	Lannate *7/25*	Lannate *8/7*	Radiant *8/17*	Radiant *8/31*

Season-Long Thrips Management Strategy

Effect on Thrips Population



Season-Long Thrips Management Strategy

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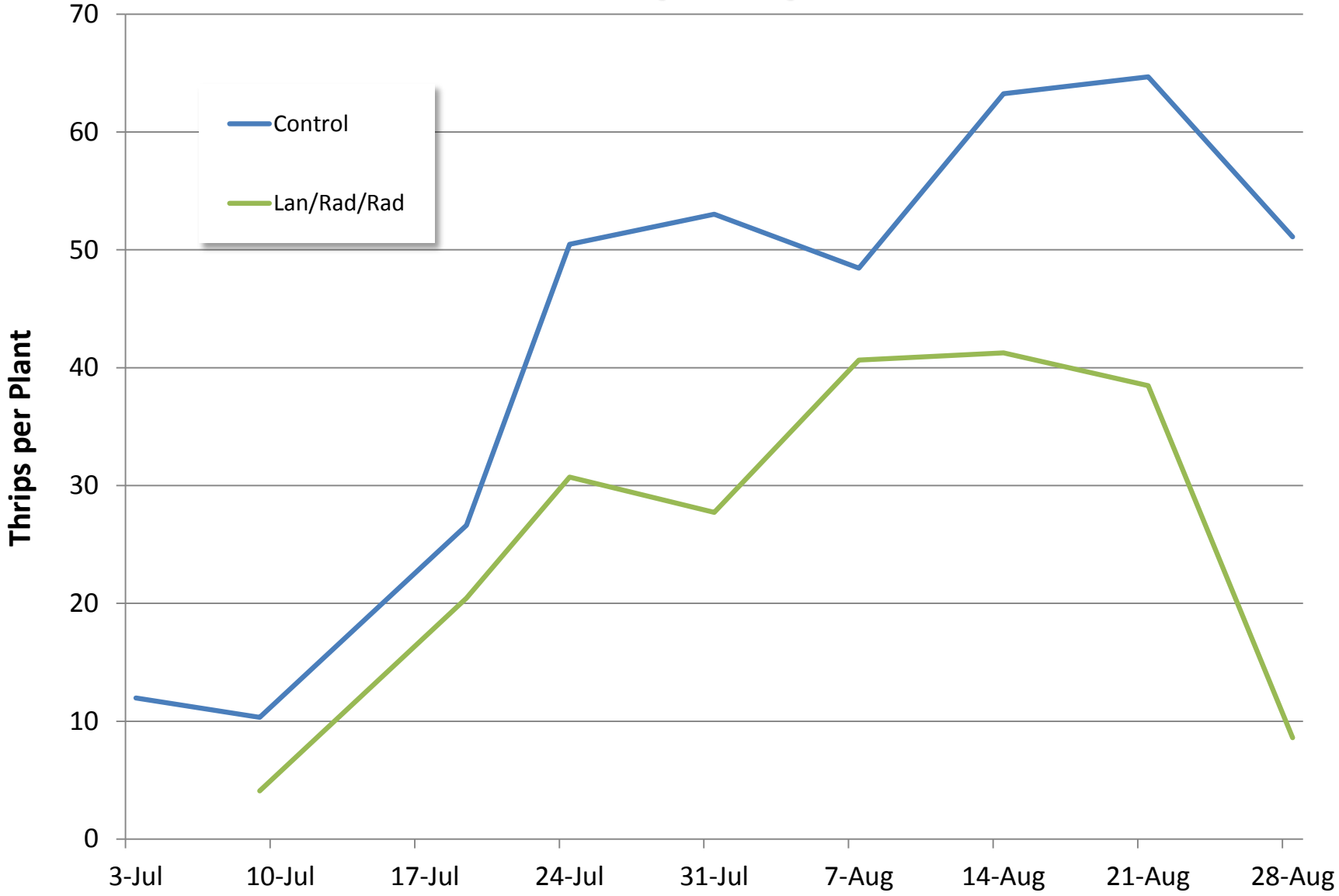
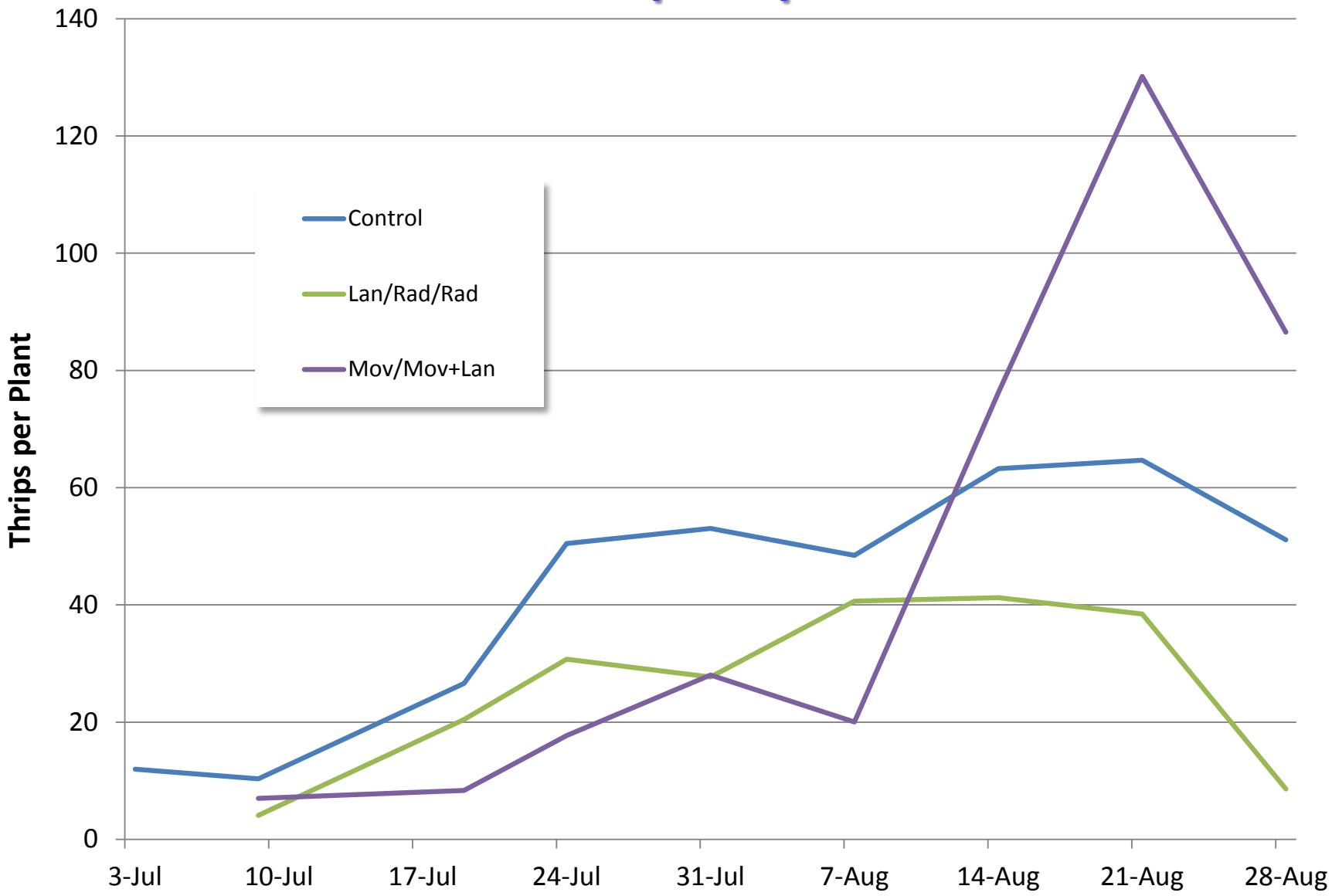


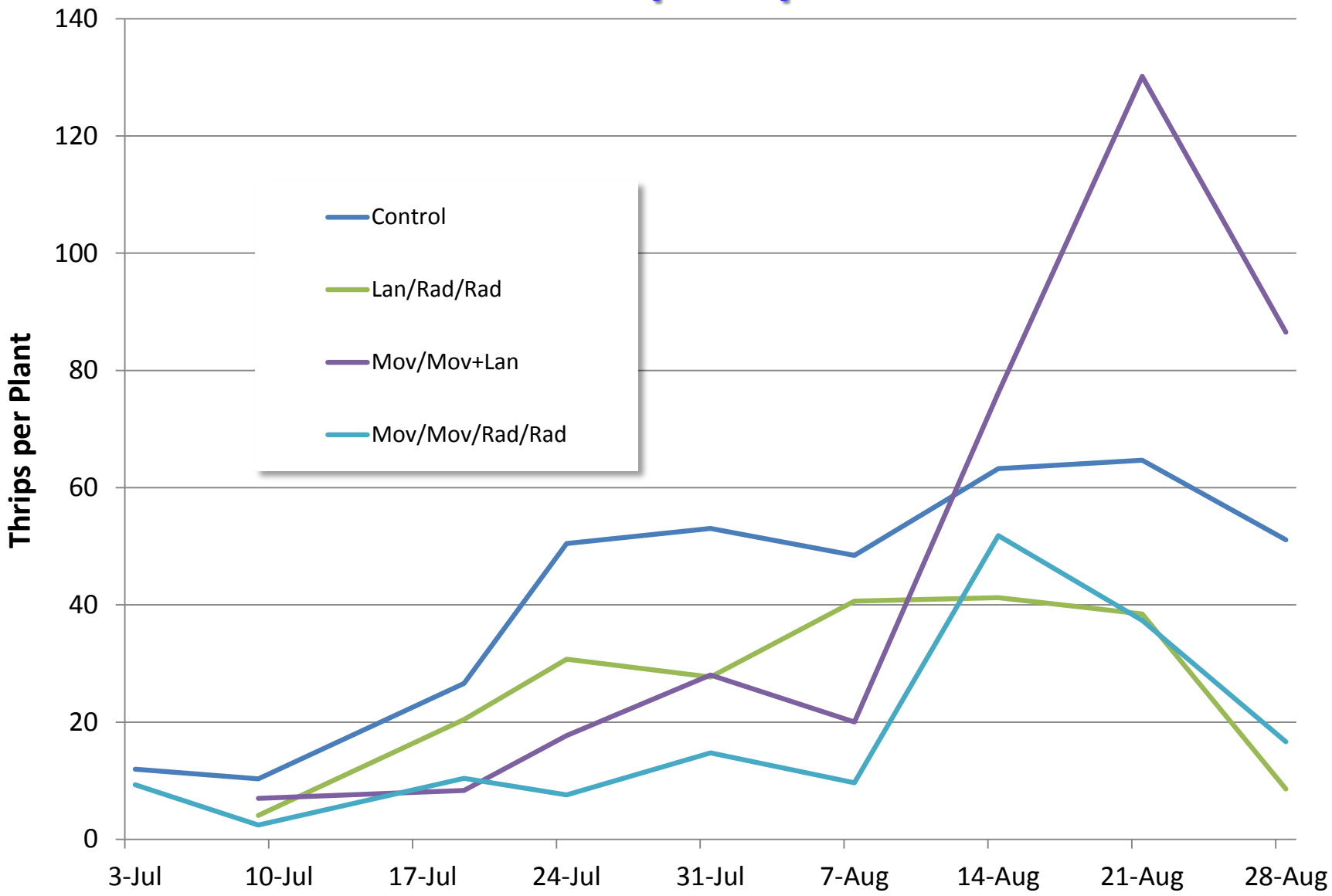
Season-Long Thrips Management Strategy

Effect on Thrips Population



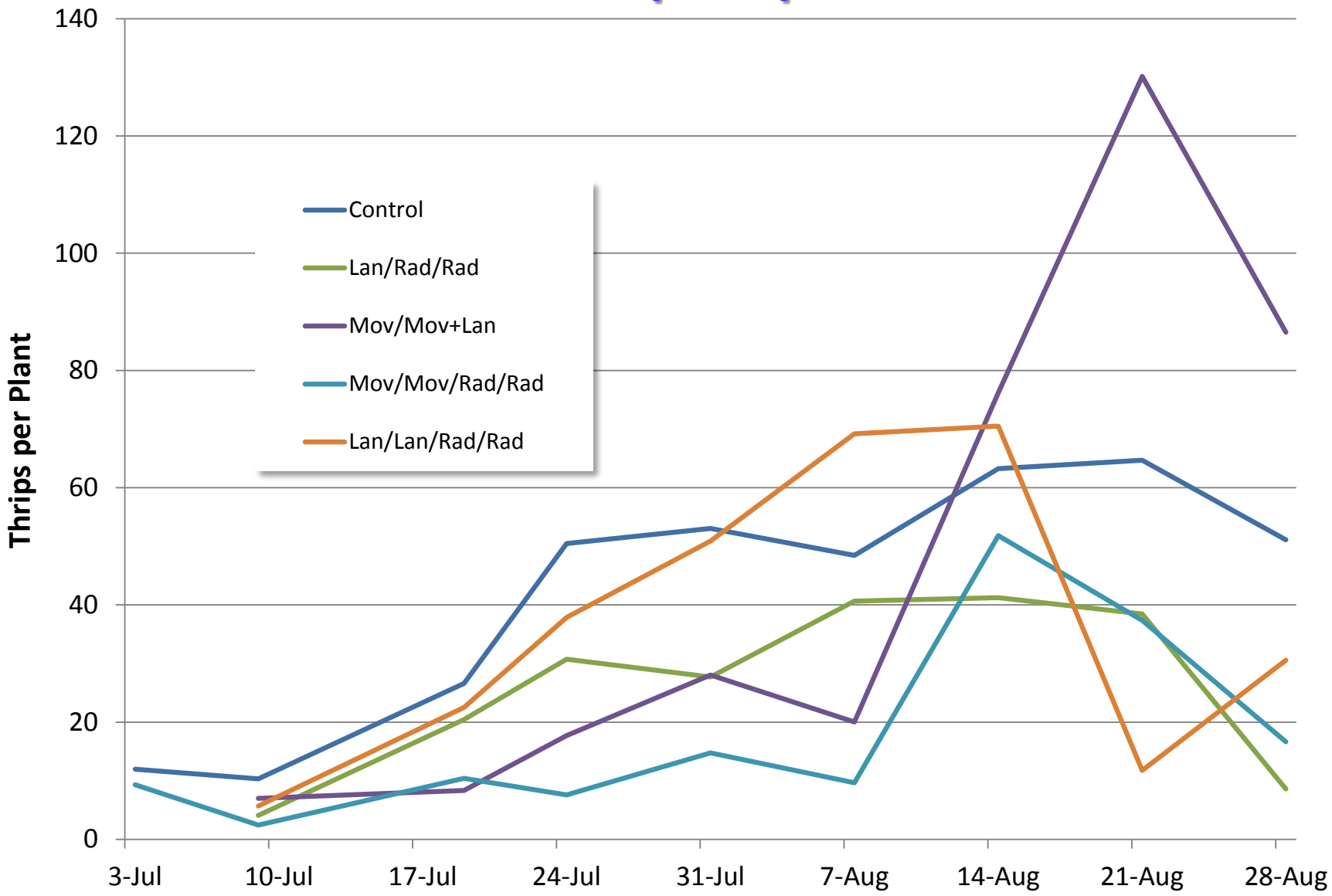
Season-Long Thrips Management Strategy

Effect on Thrips Population



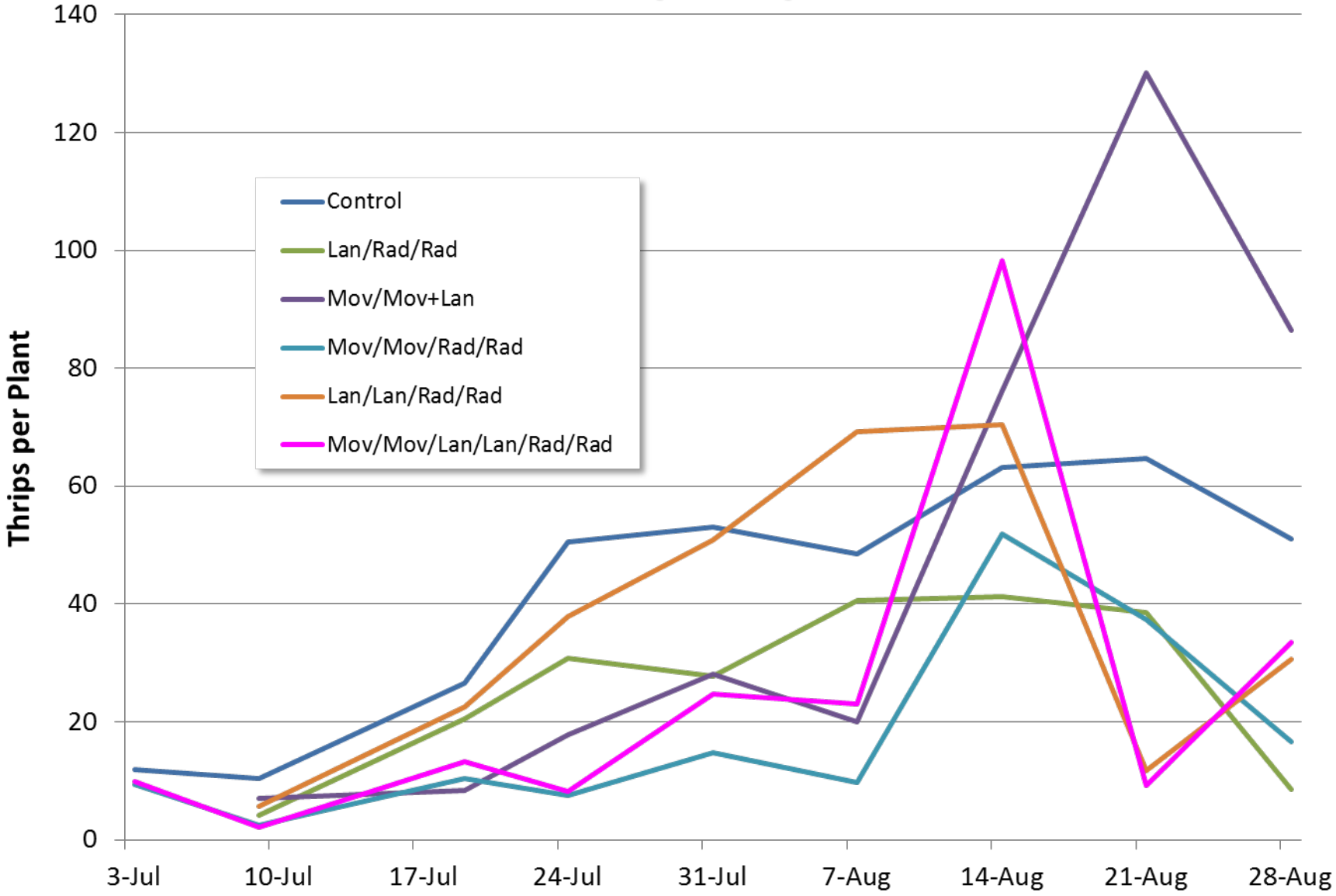
Season-Long Thrips Management Strategy

Effect on Thrips Population



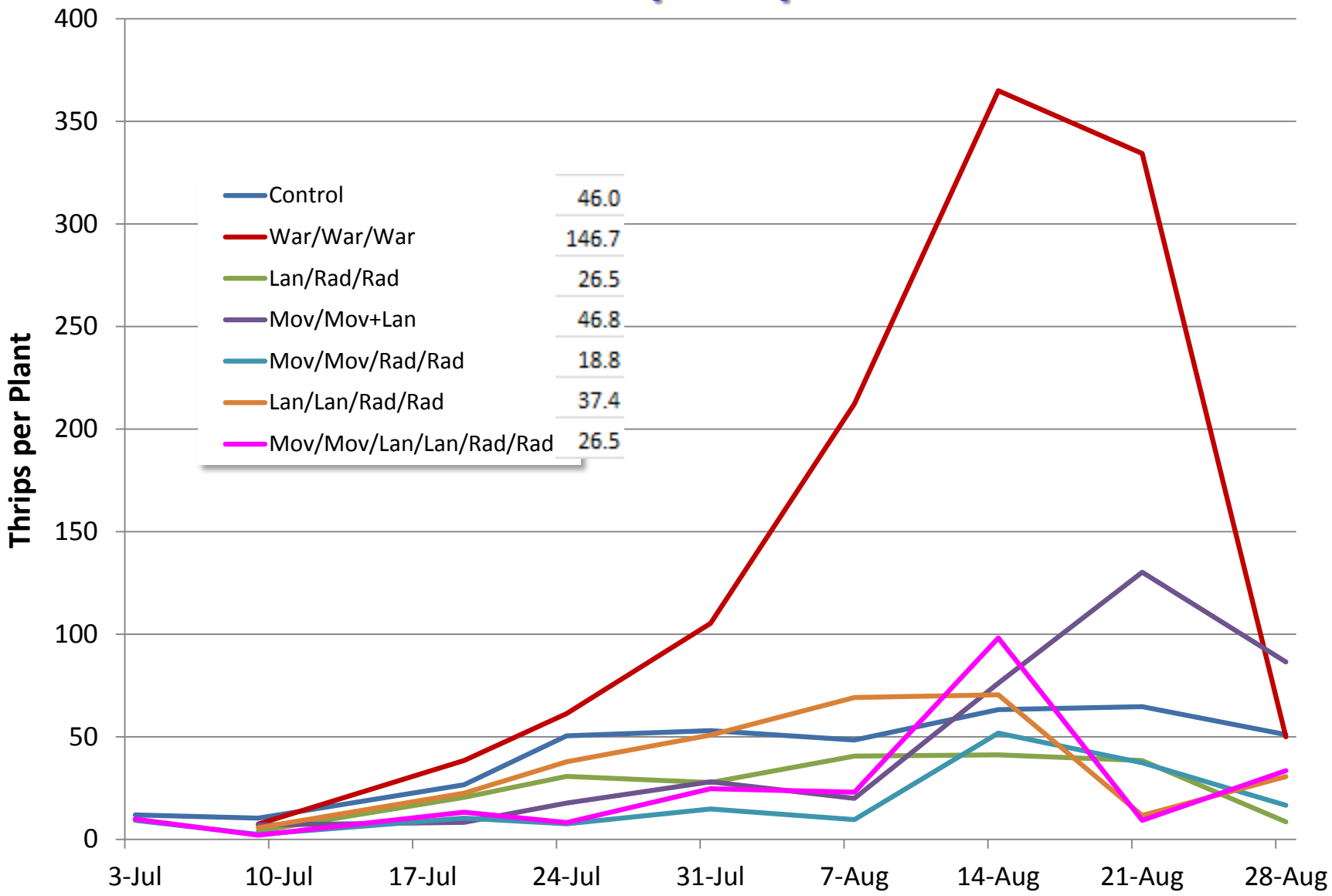
Season-Long Thrips Management Strategy

Effect on Thrips Population



Season-Long Thrips Management Strategy

Effect on Thrips Population



Resistance Management Principles

Brain Nault Professor, Dept. of Entomology Cornell University

- Products should be rotated across generations
  - Minimize exposure of the same generation to multiple active ingredients
  - Don’t use product more than twice per season
- Apply insecticide consecutively, 7 – 10 days apart
- Do not tank mix two effective insecticides
- Do not use same chemistry class more than on time per season and use treatment thresholds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JOHN DEERE

Season-Long Thrips Management

Effect on Yield 2012

1st Application	2nd Application	3rd Application	4th Application	5th Application	6th Application	Yield Tons/A
Untreated						20.4
Warrior	Warrior	Warrior				18.5
Lannate	Radiant	Radiant				20.0
Movento	Mov/Lan					19.4
Movento	Movento	Radiant	Radiant			19.8
Lannate	Lannate	Radiant	Radiant			20.2
Movento	Movento	Lannate	Lannate	Radiant	Radiant	21.0
						NS

Planter issues, irrigation uniformity, white rot

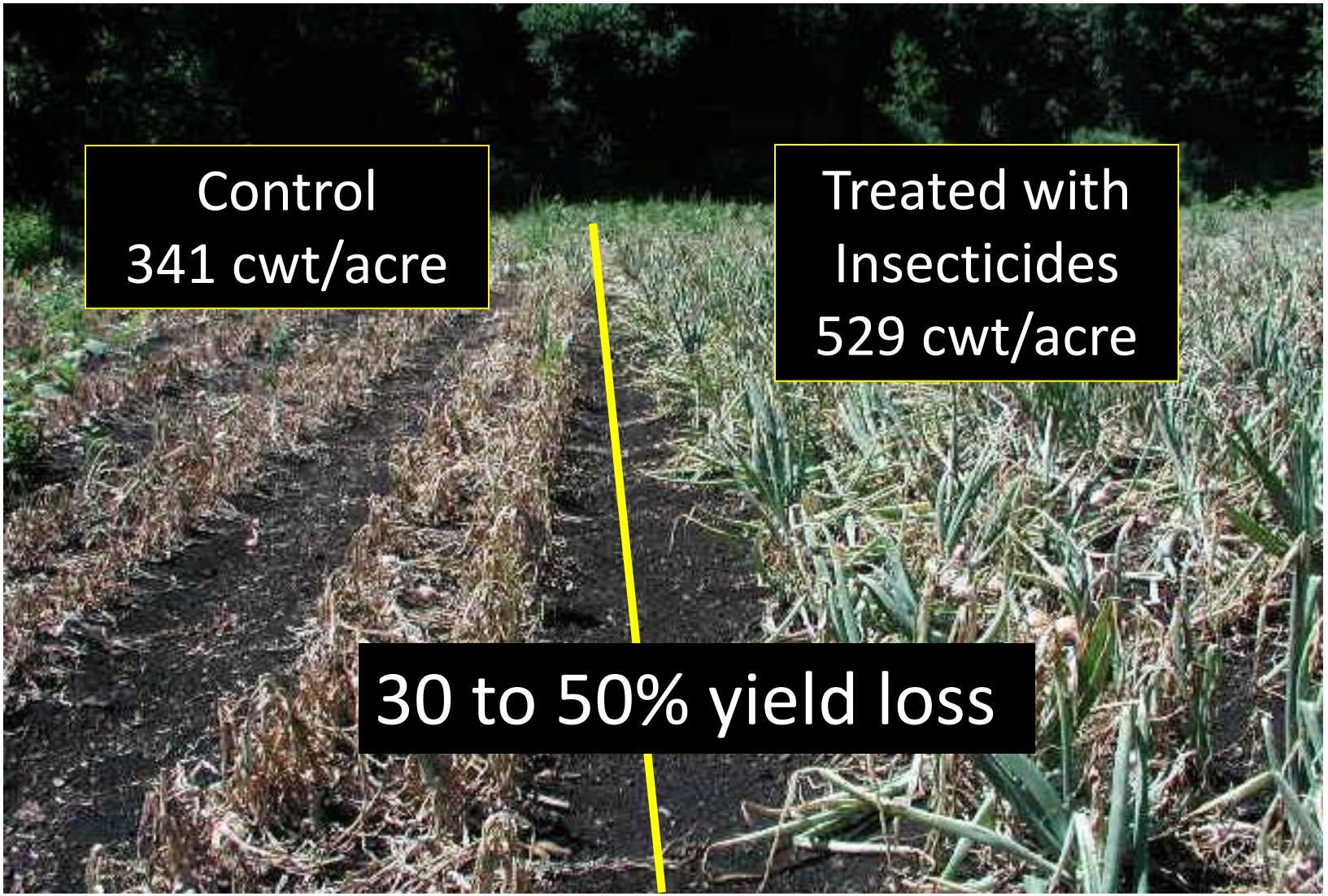
Season-Long Thrips Management

Treatment Strategies 2011

1st Applic.	2nd Applic.	3rd Applic.	4th Applic.	5th Applic.	6th Applic.	Yield Tons/A
Untreated						17.9
Warrior	Lannate	Warrior				18.5
Agri-Mek	Lannate	Radiant				18.3
Lannate	Lannate	Radiant	Radiant			16.8
Agri-Mek	Agri-Mek	Lannate	Lannate	Radiant	Radiant	18.5
Radiant	Radiant	Radiant	Radiant	Radiant	Radiant	19.0
						NS


Control
Radiant

Onion Thrips Damage in New York State



Yet Another Thrips Talk…

An Intermountain Perspective Part III

Things We Know (or think we know)

- Thrips population can vary greatly between years
- Mix of thrips species in Klamath Basin
  - Predominantly onion thrips
  - More WFT early in season in some years
- Insecticides vary in their effectiveness
  - Warrior initially knocked down population but caused subsequent spike
  - Movento very effective over two applications
  - Radiant and Agri-Mek also effective
  - Aza-Direct plus Radiant lower thrips population than Radiant alone
  - Movento plus Lannate most effective treatment
  - Lannate alone may not be good choice in season-long strategy

Things We Don't Know
(but wish we did know)

- Why thrips populations vary so much from year to year
- What causes thrips populations to crash in some years?
- Why are back-to-back applications of Movento much more effective
- Back-to-back applications of other insecticides superior?
- Why is Movento effective in Klamath Basin?
- Why do thrips populations surge after some insecticide applications?

Things We Don't Know
(but wish we did know)

- Effect of thrips on onion yield?
- Economic threshold (maintain pop. below what level)?
- Threshold based on…
  - Thrips per plant? Thrips per leaf? Thrips per unit area?
- Should economic threshold vary with different insecticides?
- How many insecticide applications are needed for maximum profit?
- If three applications needed…
  - Treat early to cap off population
  - Treat later because resurgence from early applications but higher population more difficult to control
  - At what growth stage are thrips most damaging



Thank You

This research is supported by
CA Garlic and Onion Research Advisory Board

UC CE | University of California
Agriculture and Natural Resources | Cooperative Extension