Intermountain Thrips Story:

What we have learned and what we would still like to know…

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Funded by CGORAB

Objectives

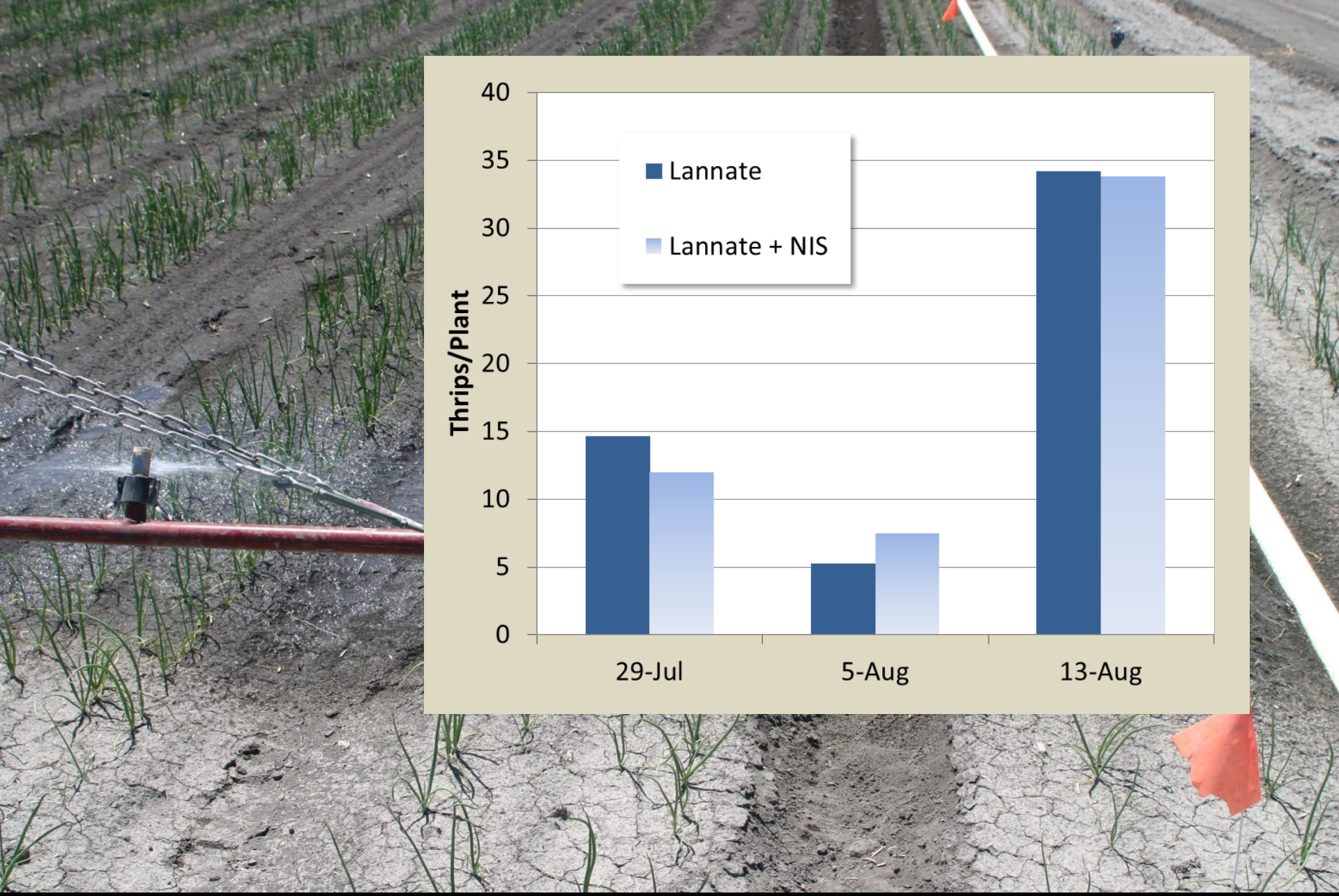
- Which thrips species in the Klamath Basin
- Chemigation vs. foliar-applied (2 insecticides)
- Evaluate the need for an adjuvant when applying insecticides via chemigation
- Compare effectiveness of a range of insecticides
- Evaluate different strategies for thrips management over the season

  (number of treatments, timing, and different insecticides sequences)
- Determine effect of different thrips populations on onion yield.

10 whole plants collected from each plot and stored in plastic bag

Onion leaves pulled apart and left to soak for in solution with water, bleach and dish detergent

After 10 minutes shaken and then soak for 10 more minutes. Rinsed and poured into pots with fine screens. Backwash thrips from fine screen with ethanol into vials.

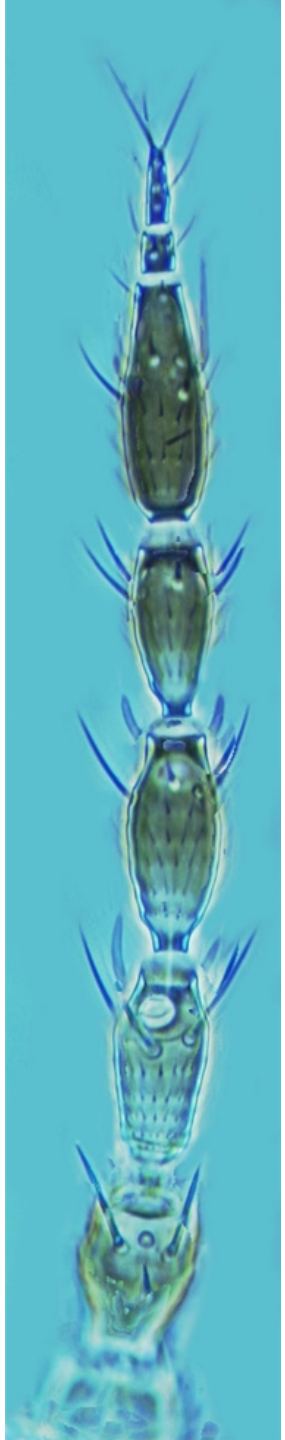


No significant difference in efficacy Chemigation vs. Spray for Radiant or Lannate/Warrior

WFT?

Frankliniella occidentalis

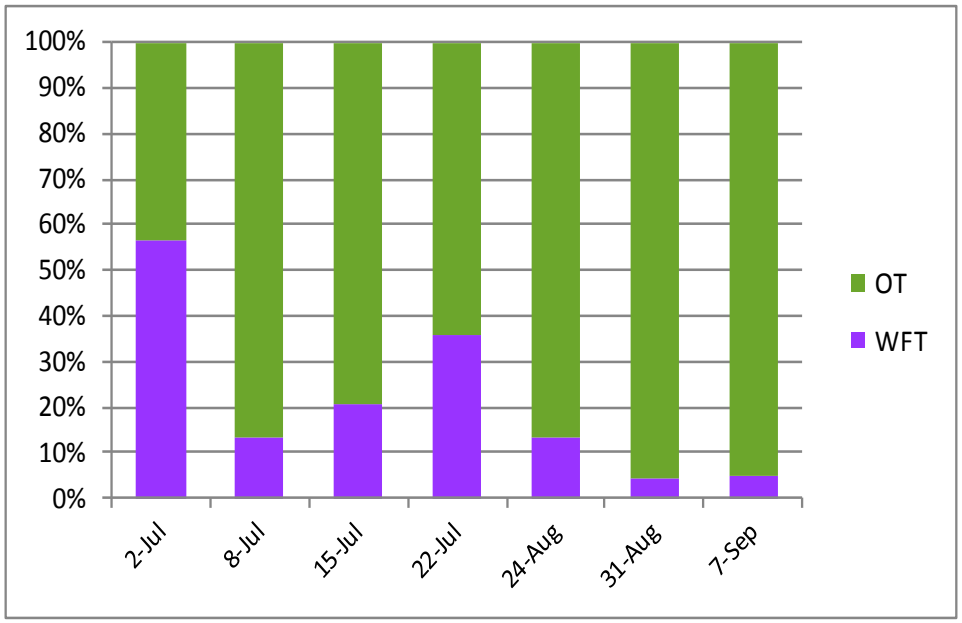
Reproduces sexually, males and females common



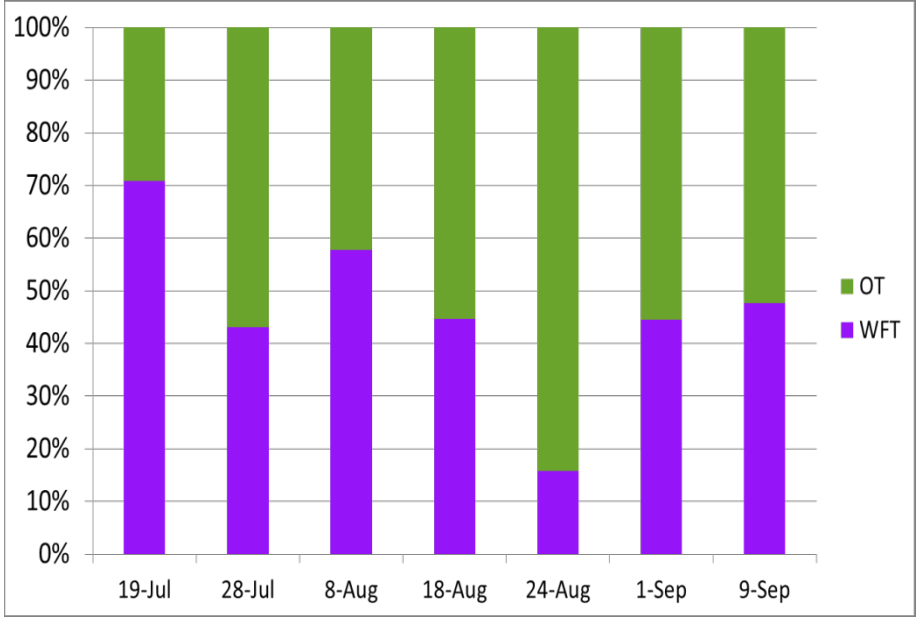
Onion Thrips

Thrips tabaci

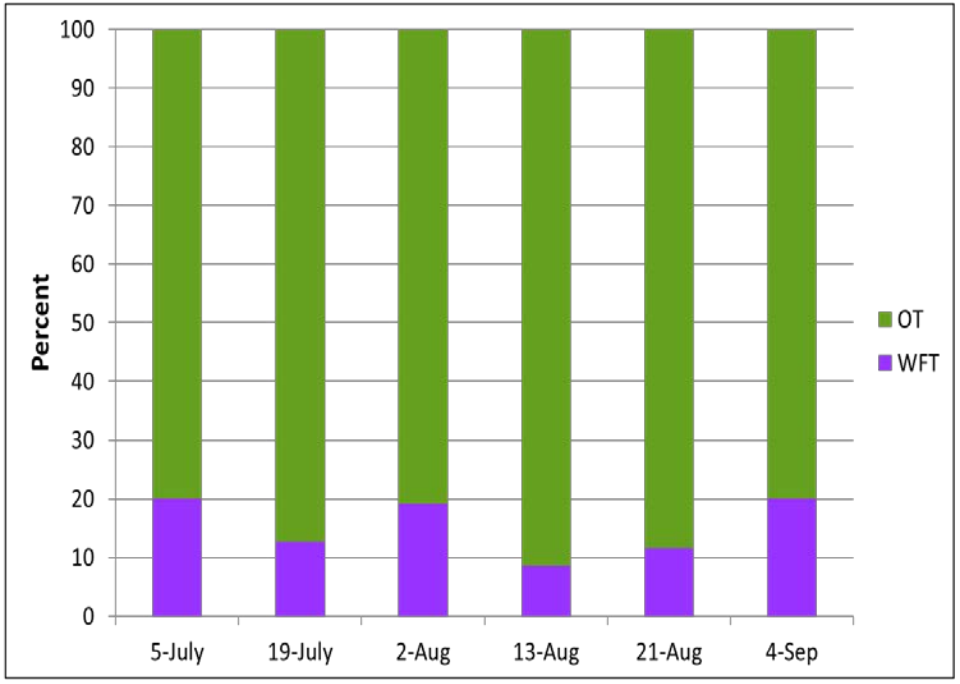
Asexual reproduction by females (parthenogenesis)



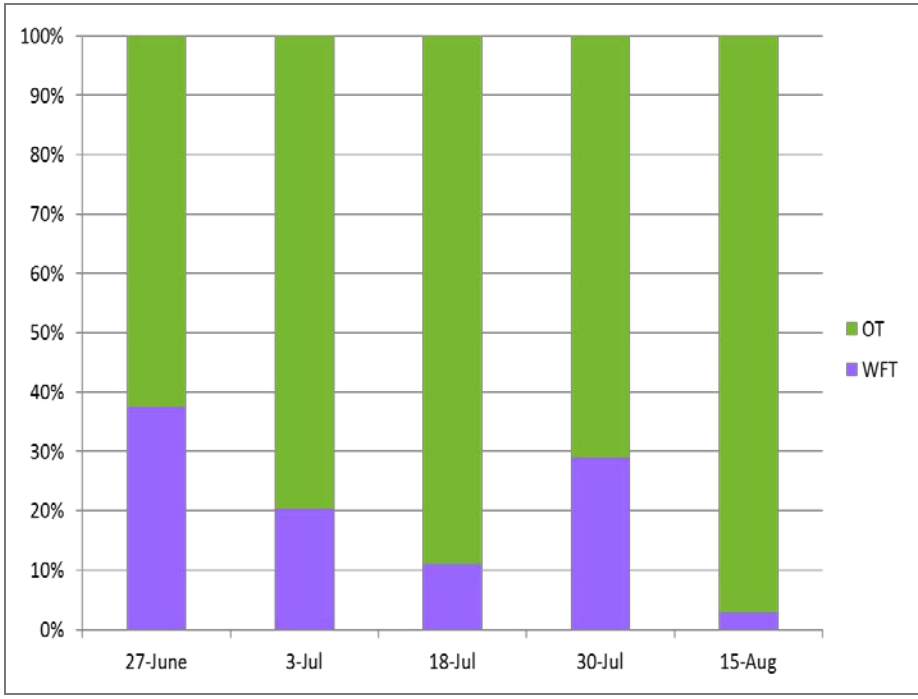
2010



2011

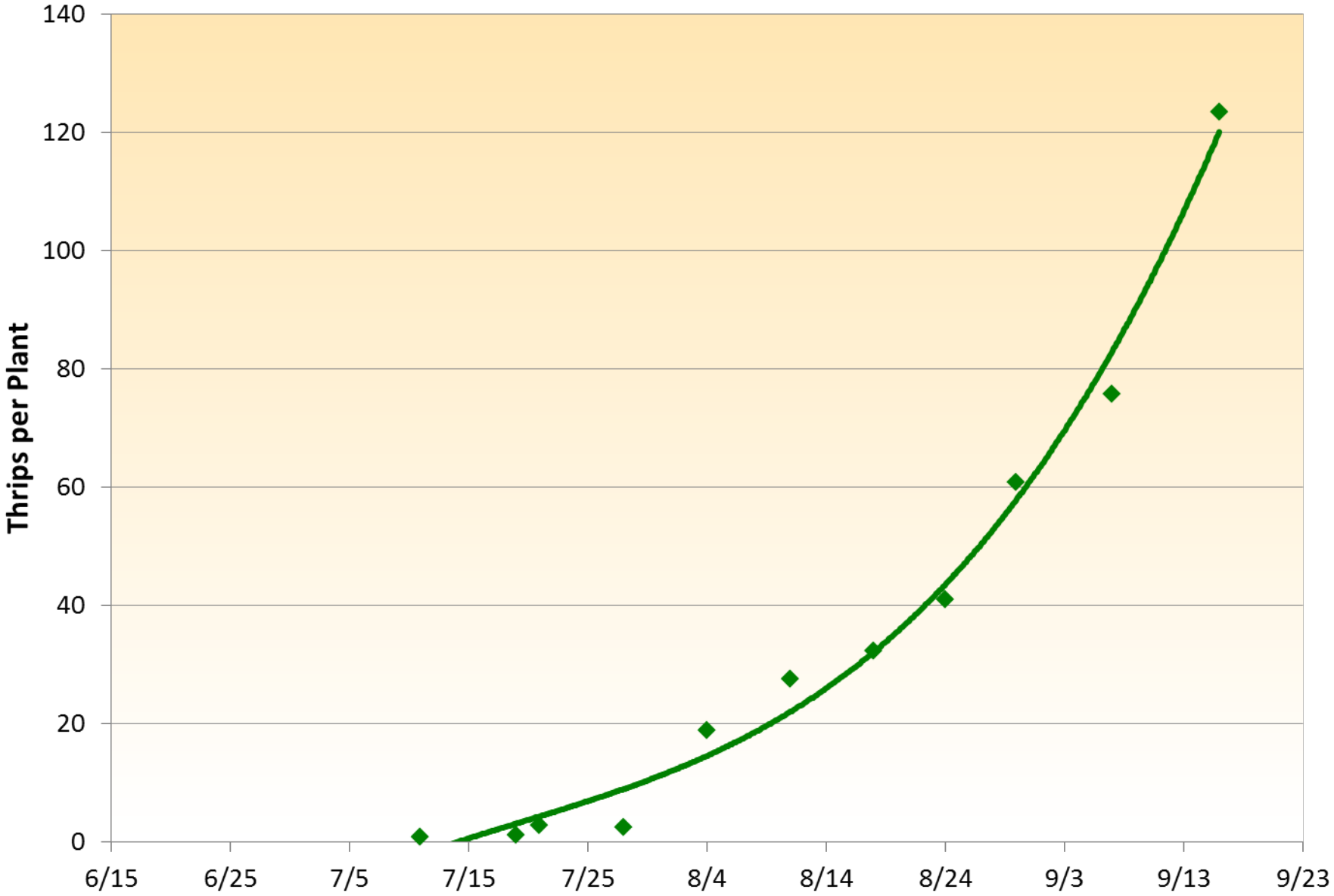


2012



2013

Thrips Population Over the Growing Season 2011



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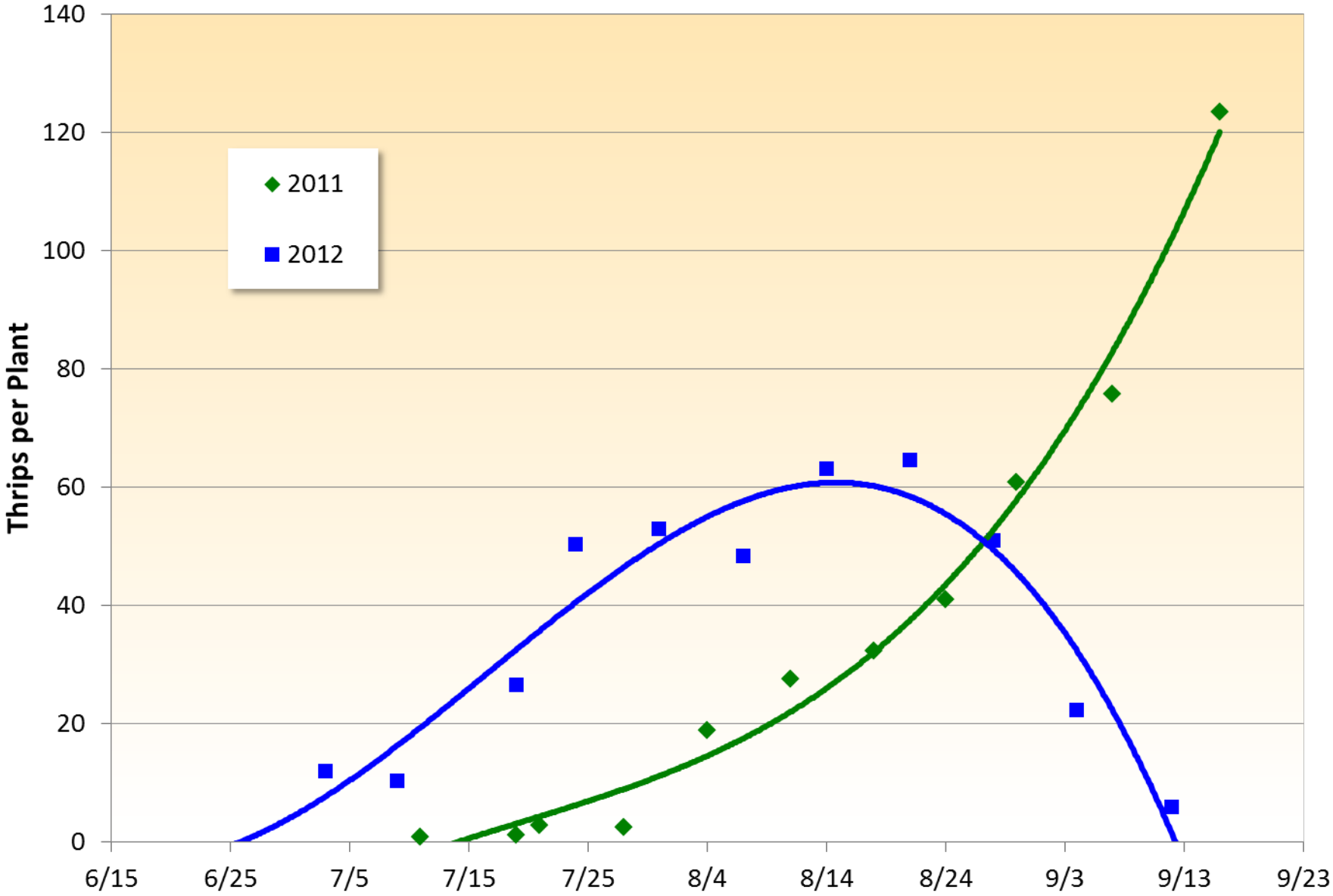
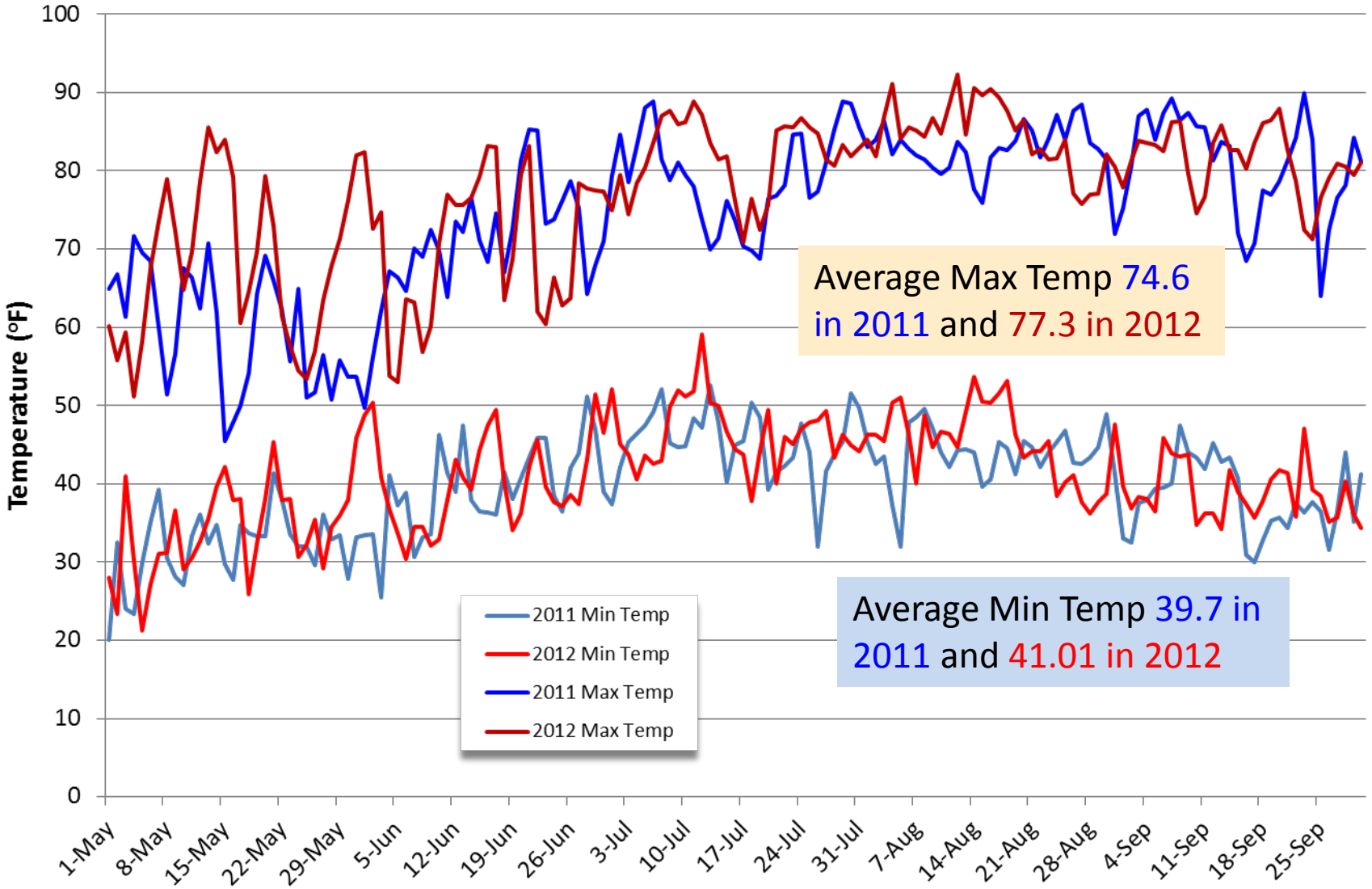


2011 vs. 2012 Max and Min Daily Temperatures



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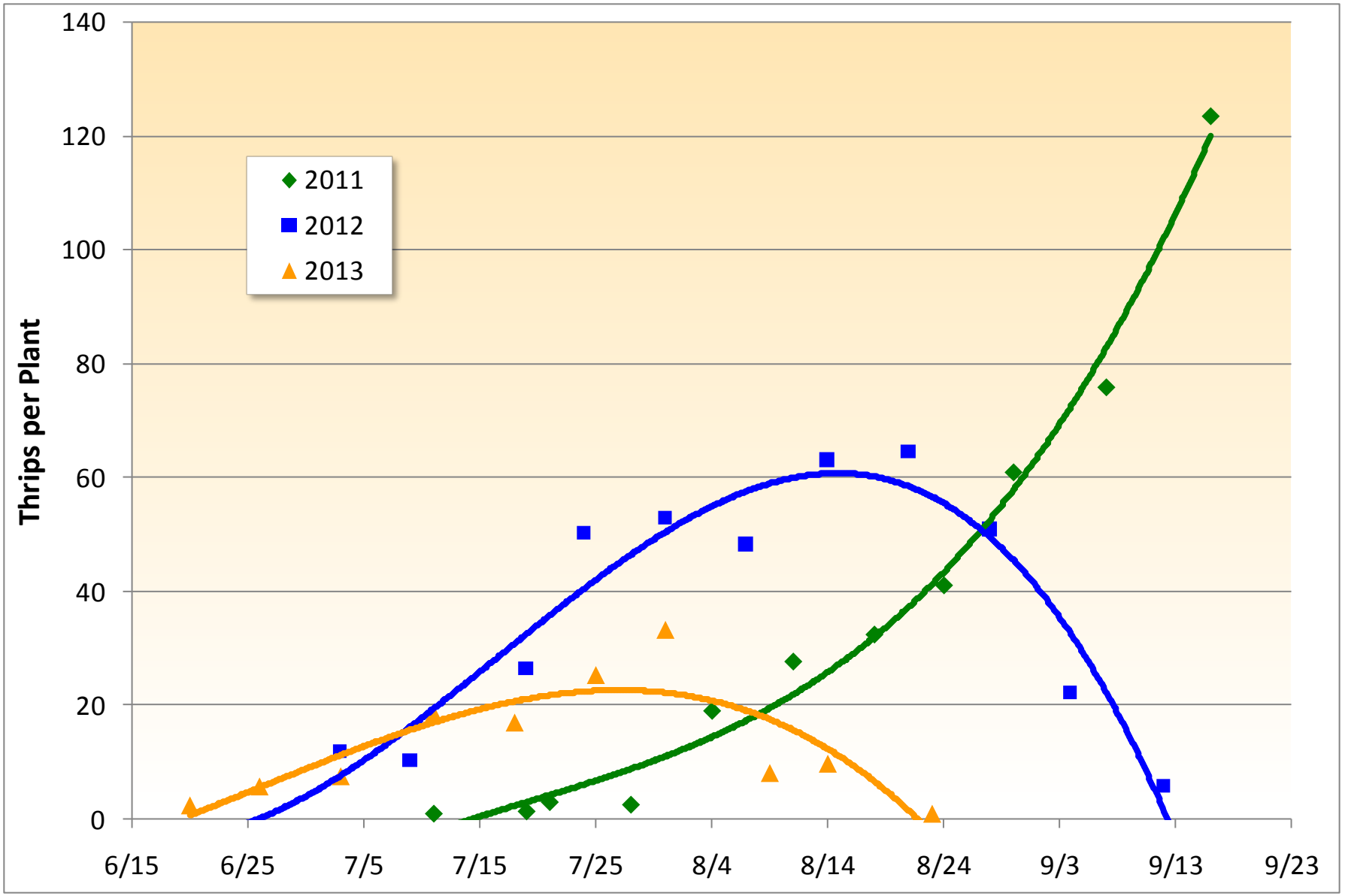
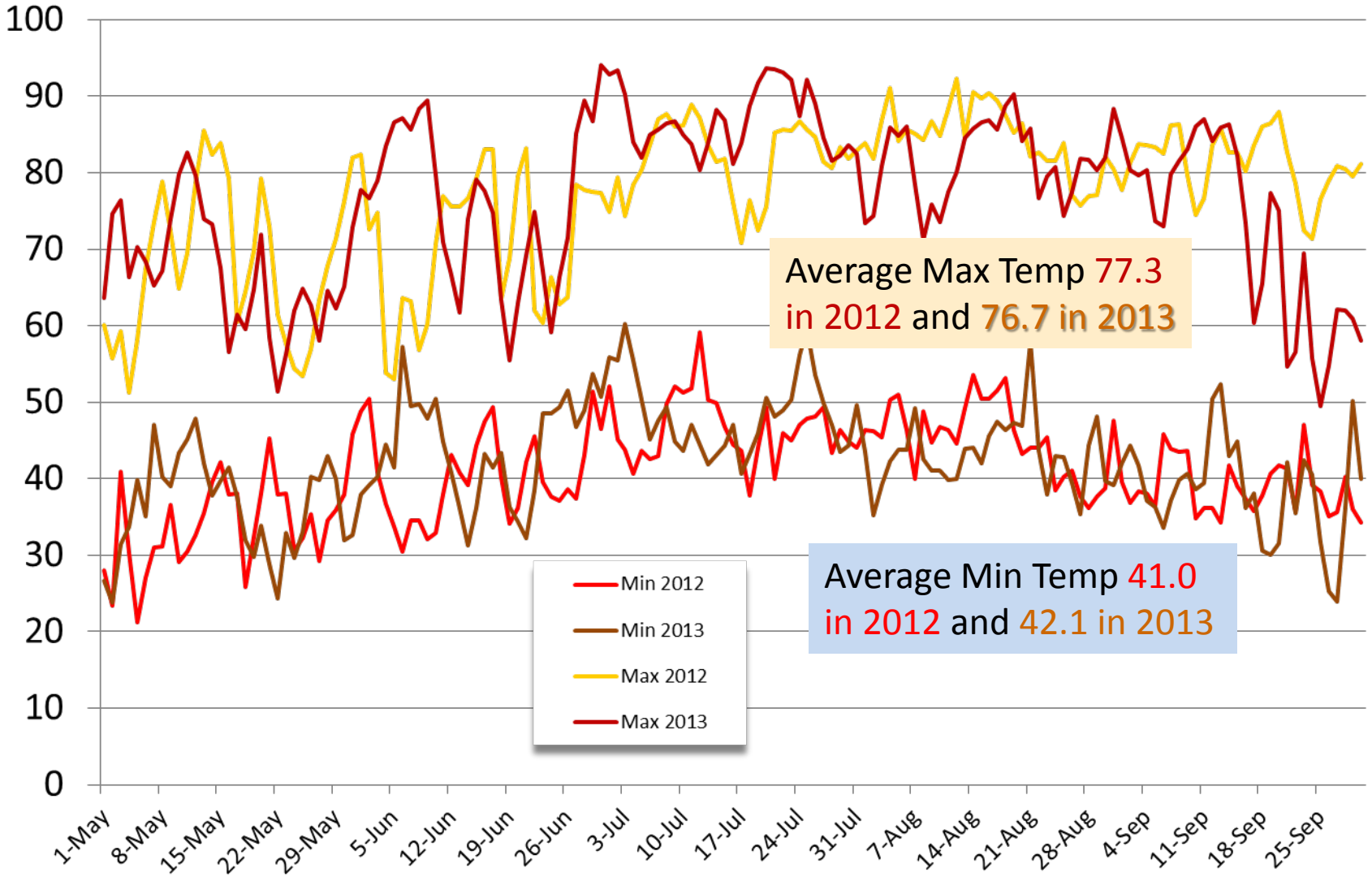


2012 vs. 2013 Max and Min Daily Temperatures



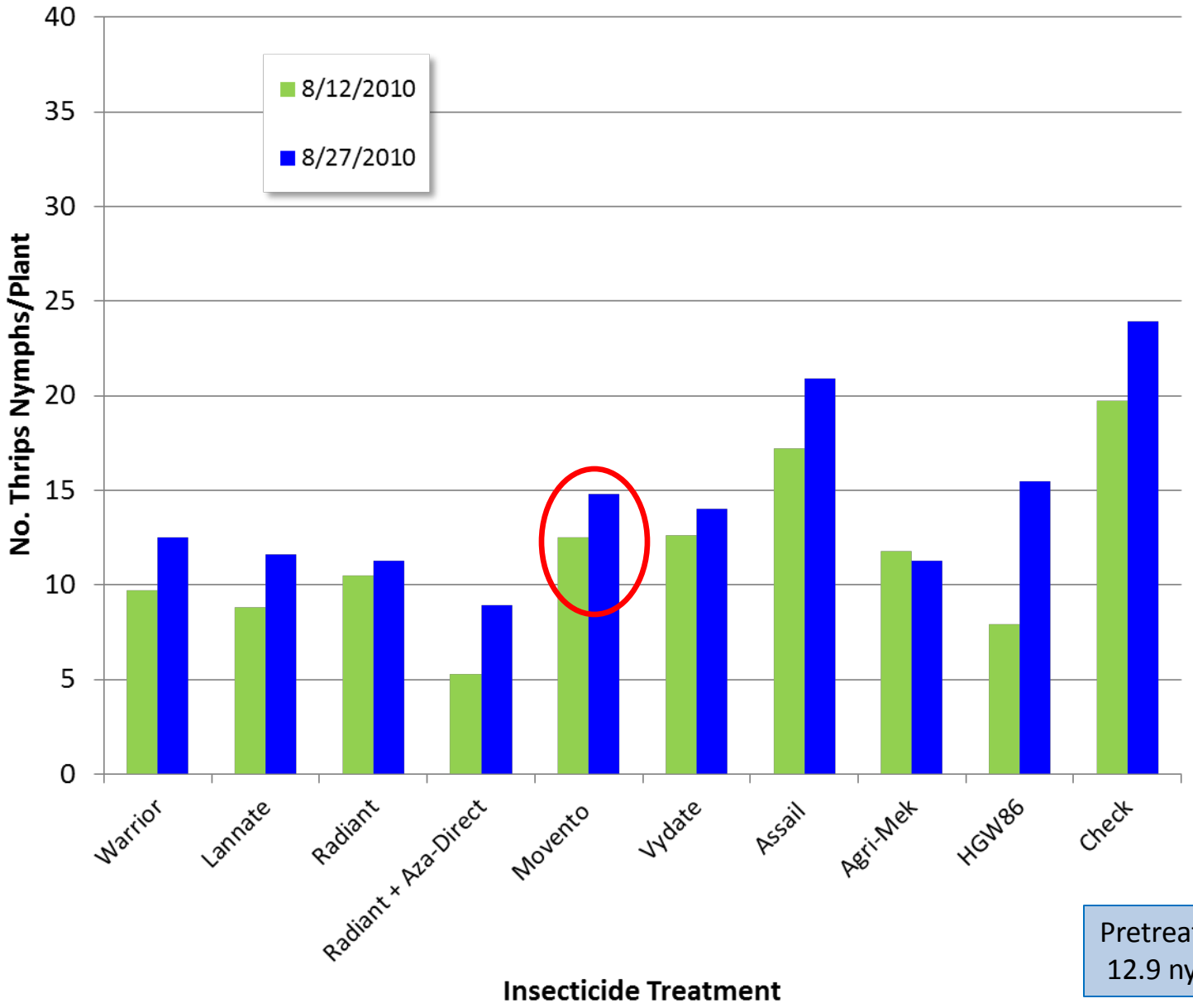
Insecticide Comparison Trial

Season-Long Thrips Strategy

Insecticides Evaluated 2010-2012

Insecticide	Rate/A
Warrior	1.92 oz
Vydate	4 pts
Assail	8 oz dry
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
Cyazypyr	20.5 oz

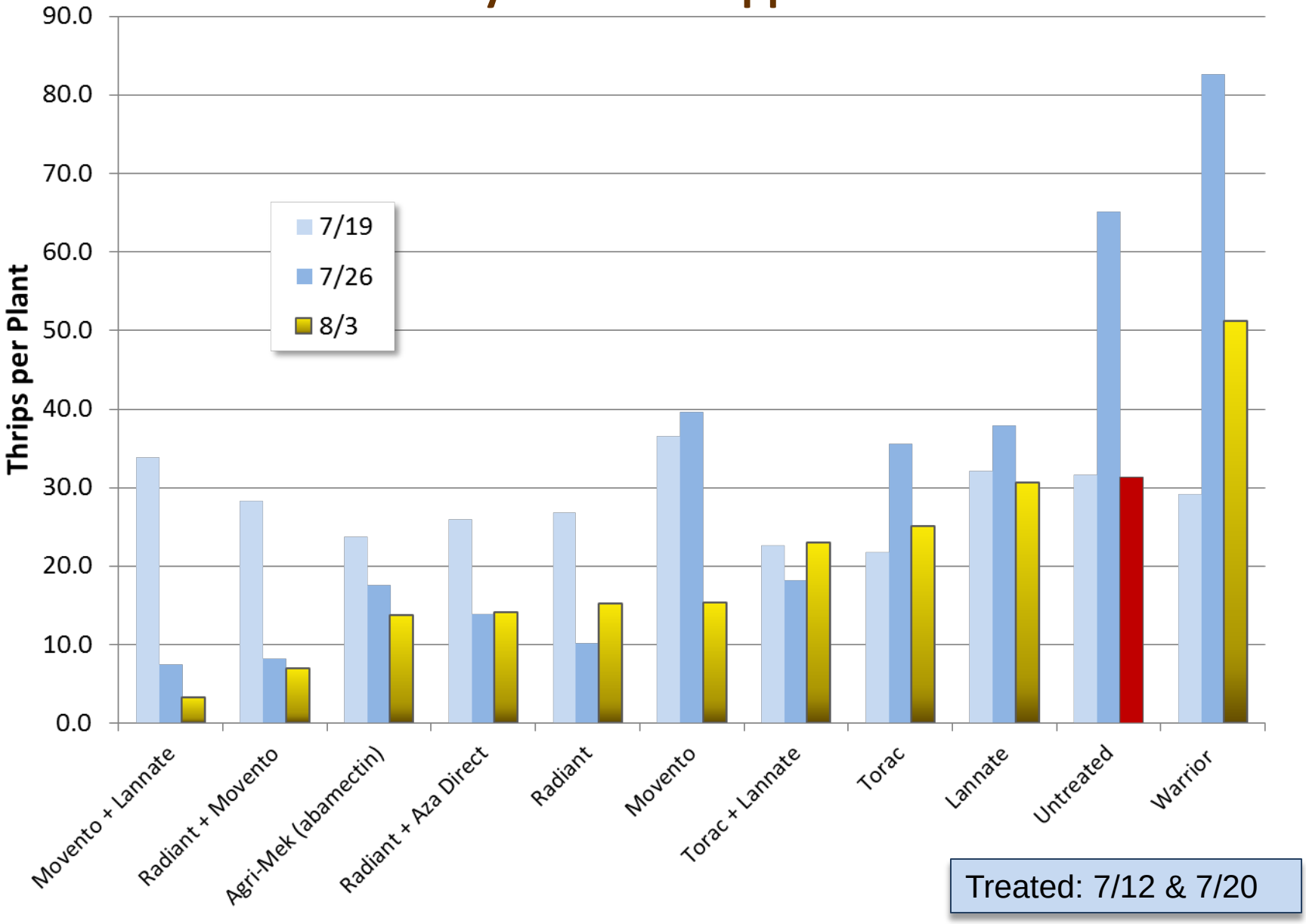
Insecticide Treatment Effects on Thrips Population 2010



Pretreatment
12.9 nymphs /plant

Insecticide Treatment Effects on Thrips Population 2012

14 Days after 2nd Application



Insecticide Sequence

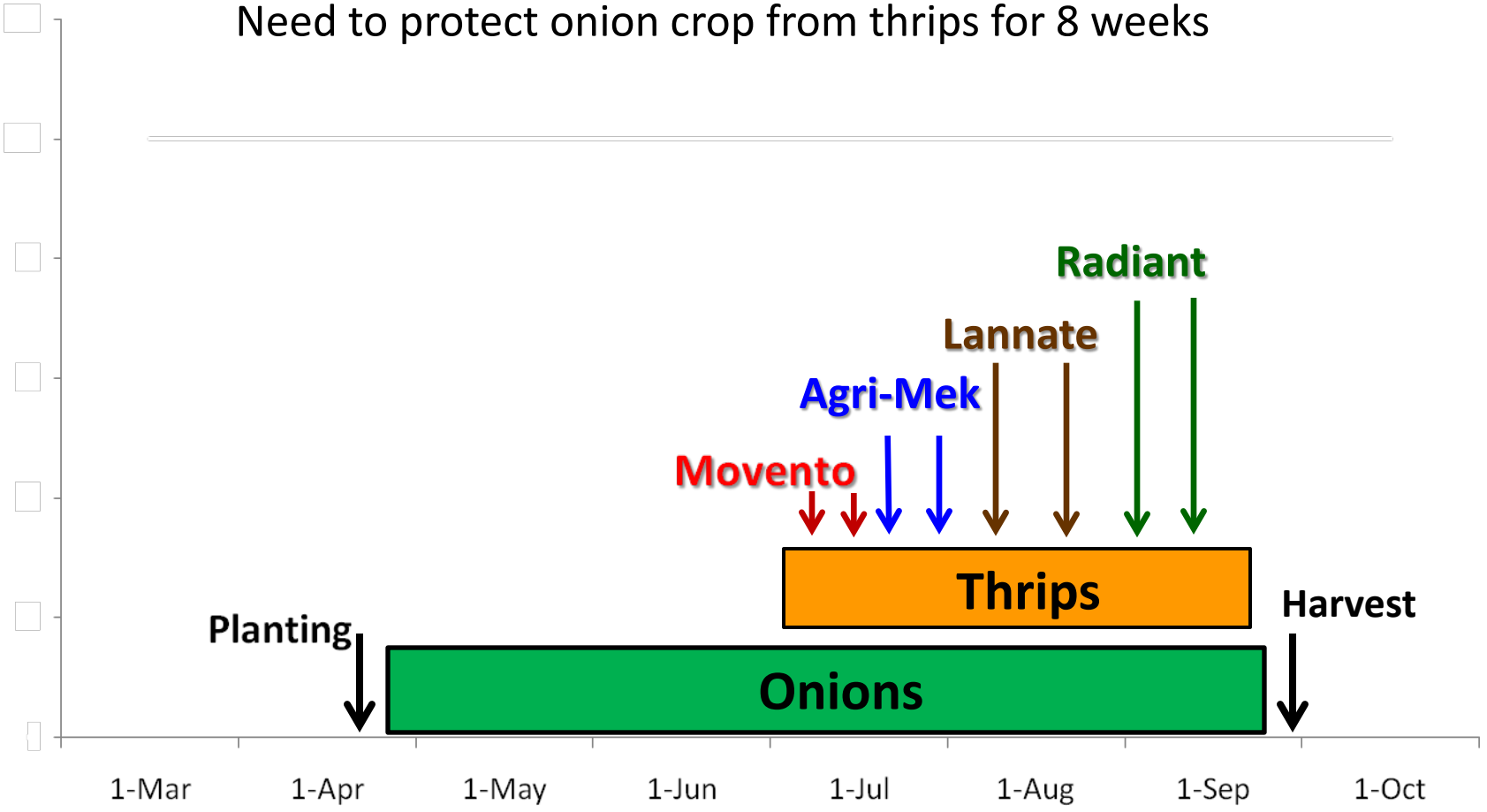
Proposed by Brain Nault Professor, Dept. of Entomology Cornell University

- 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

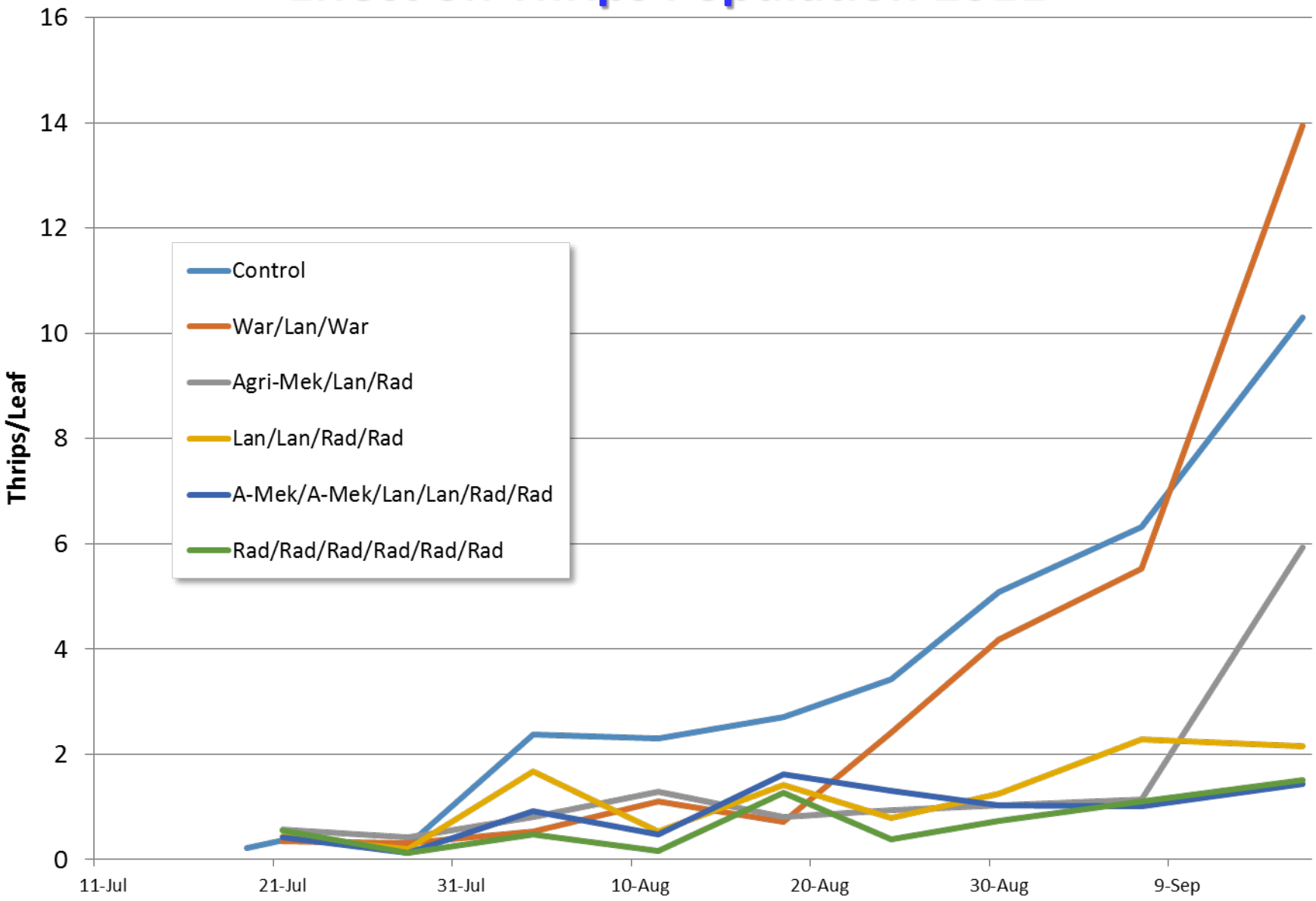
Proposed by Brain Nault Professor, Dept. of Entomology Cornell University

Need to protect onion crop from thrips for 8 weeks



Season-Long Thrips Management Strategy

Effect on Thrips Population 2011



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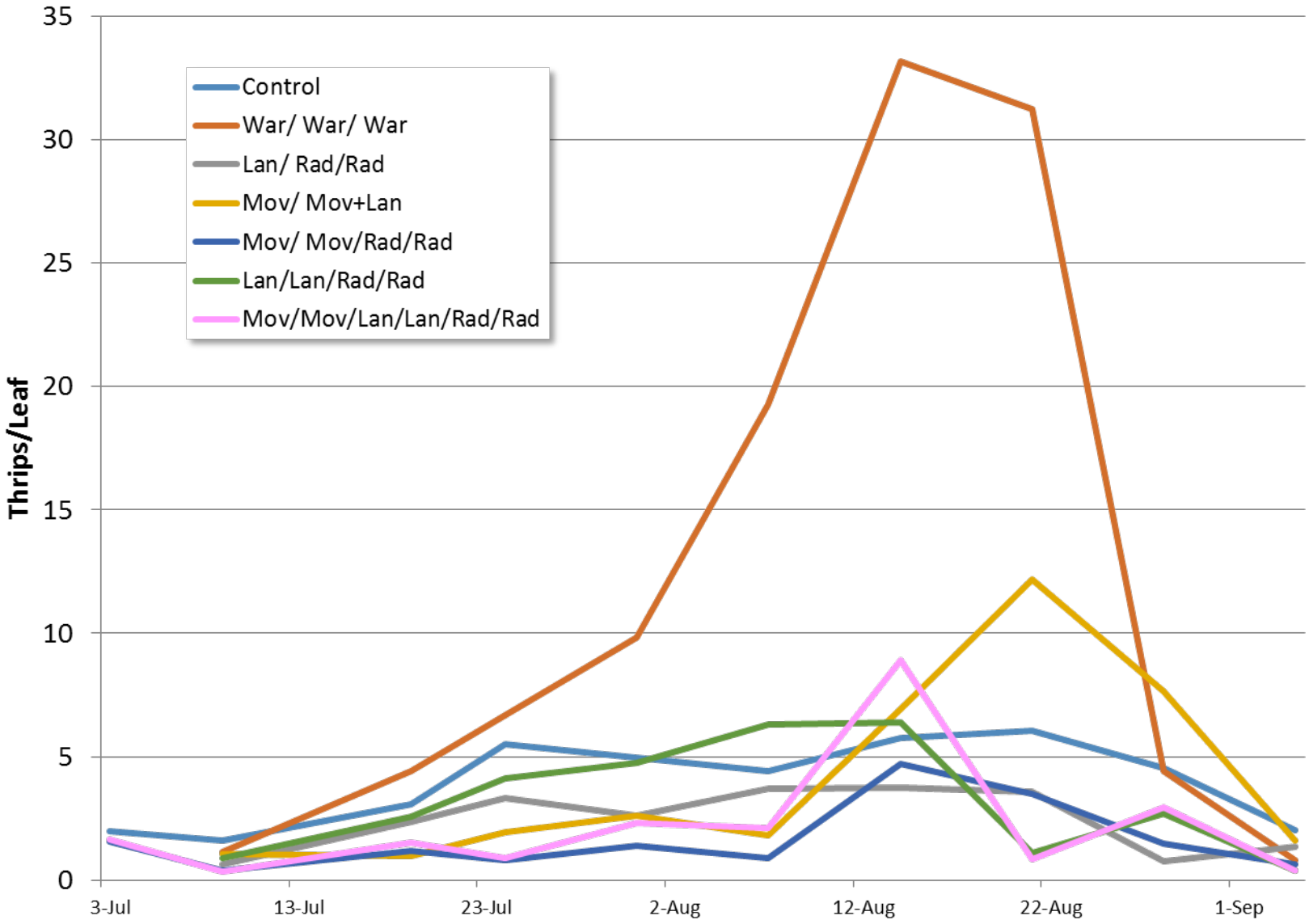

Season-Long Thrips Management Strategy

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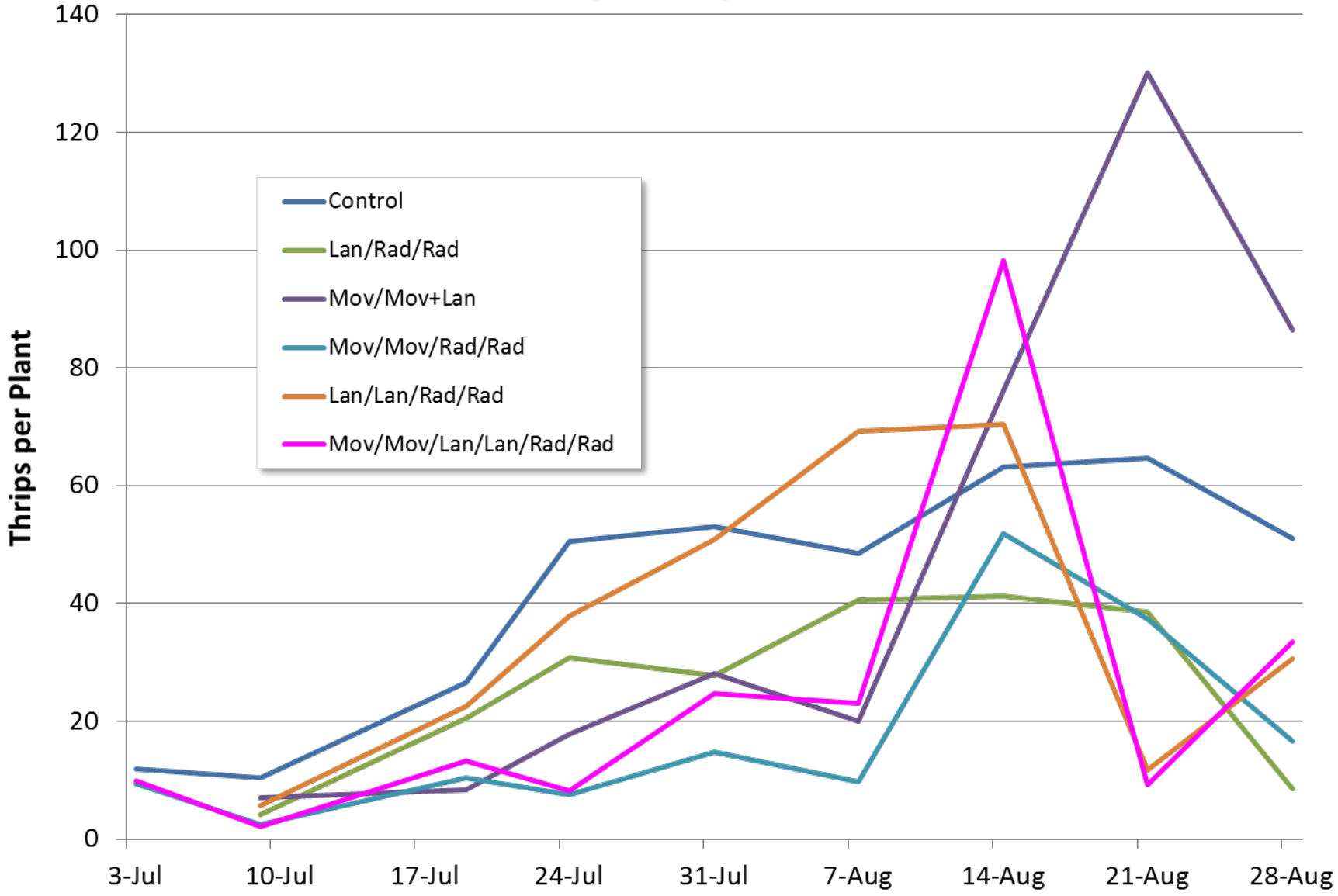


Season-Long Thrips Management

2013 Treatments

1st Application	2nd Application	3rd Application	4th Application	5th Application	6th Application
Untreated					
Warrior *7/3*	Warrior *7/31*	Warrior *8/12*			
Mov/Lan *7/3*	Radiant *7/31*	Agi-Mek			
Movento *6/20*	Movento *7/15*	Radiant *7/31*	Radiant		
Radiant *6/20*	Movento *7/15*	Movento *7/31*	Radiant		
Agri-Mek *6/20*	Agri-Mek *7/15*	Radiant *7/31*	Radiant		
Agri-Mek *6/20*	Radiant *7/15*	Agri-Mek *7/31*	Radiant		
Movento 6/20	Movento *7/3*	Radiant *7/22*	Radiant *7/31*	Agri-Mek *8/12*	Agri-Mek *8/22*

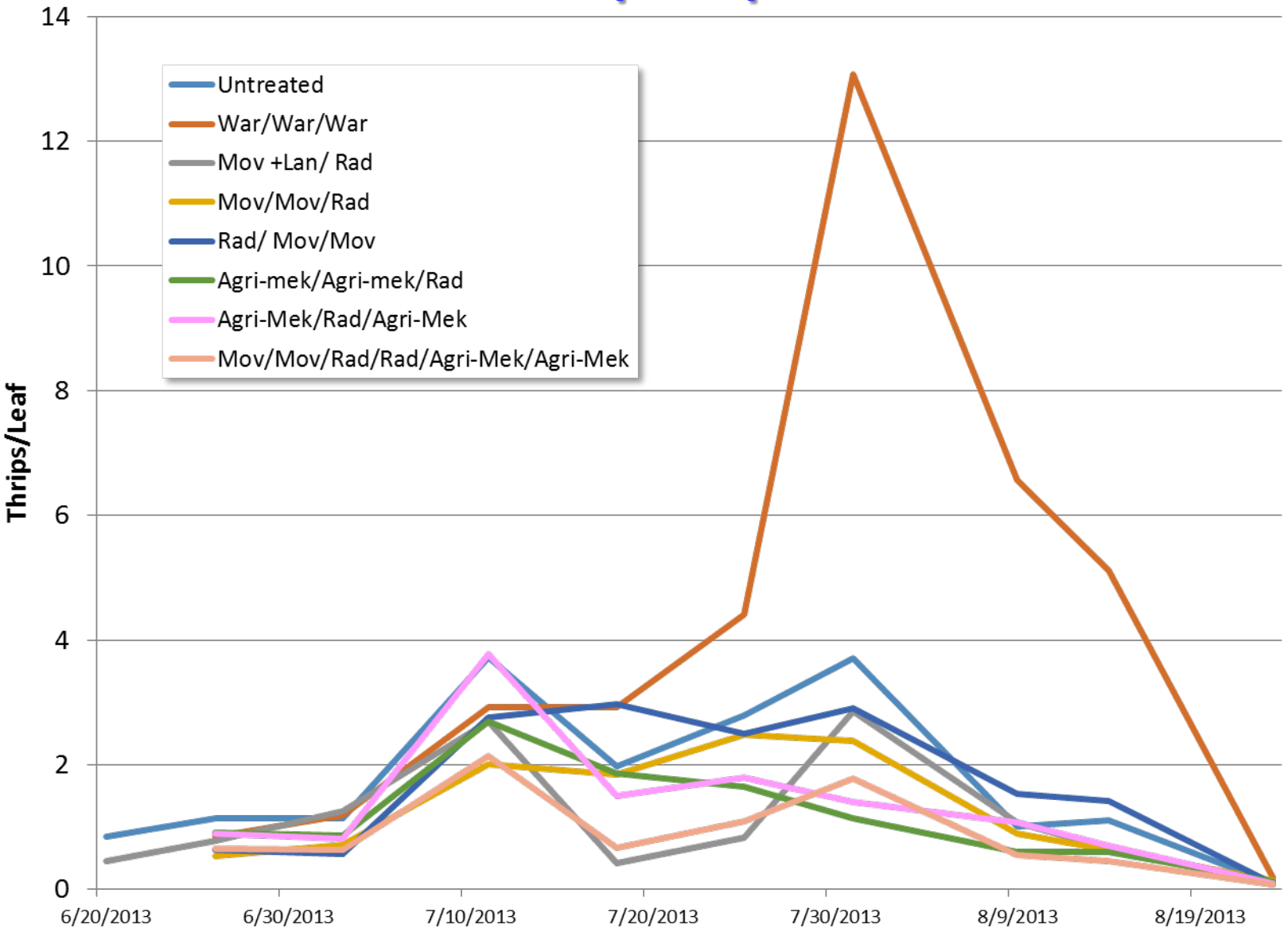
Season-Long Thrips Management

2013 Treatments

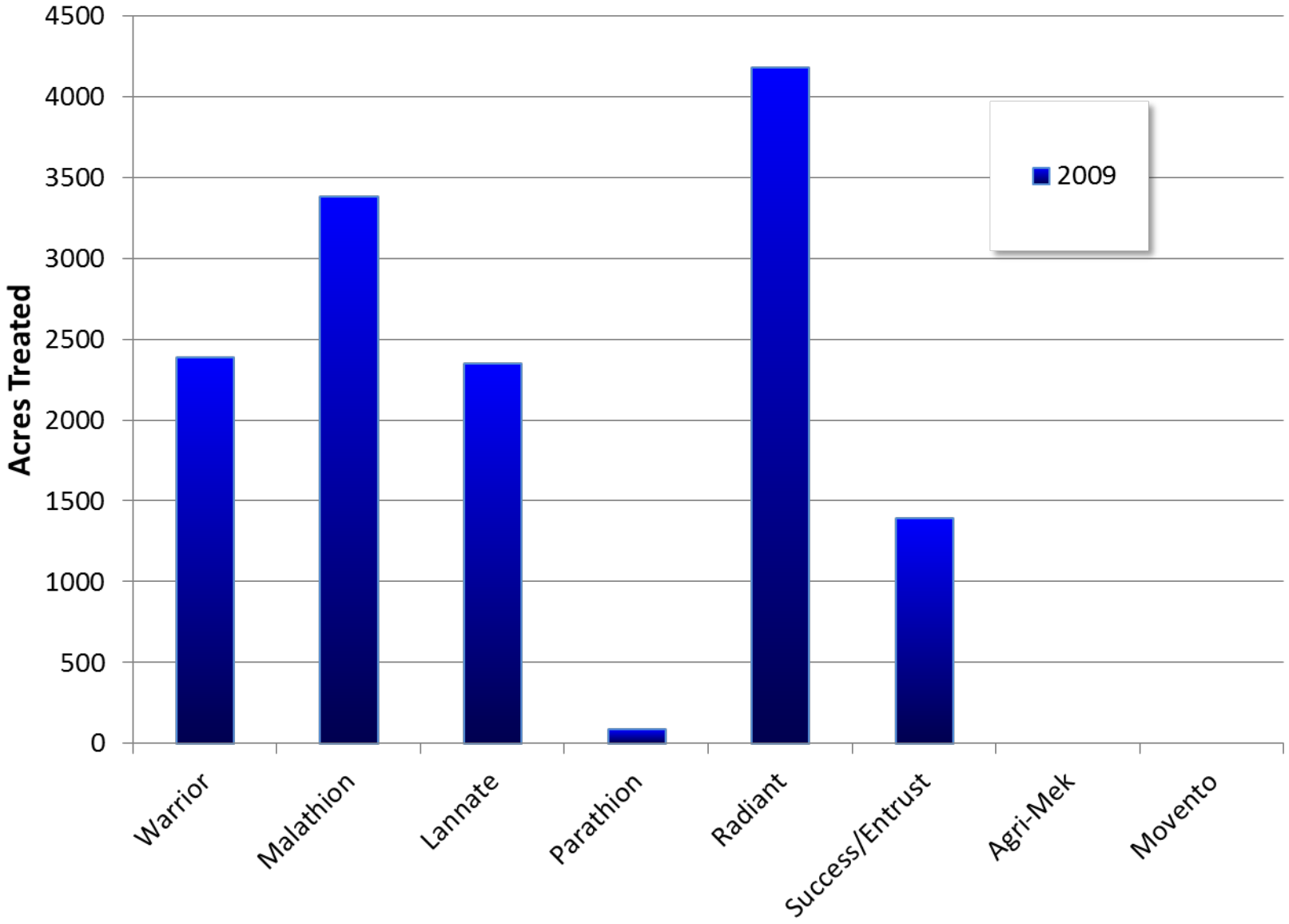
1st Application	2nd Application	3rd Application	4th Application	5th Application	6th Application
Untreated					
Warrior *7/3*	Warrior *7/31*	Warrior *8/12*			
Mov/Lan *7/3*	Radiant *7/31*	~~Agi-Mek~~			
Movento *6/20*	Movento *7/15*	Radiant *7/31*	~~Radiant~~		
Radiant *6/20*	Movento *7/15*	Movento *7/31*	~~Radiant~~		
Agri-Mek *6/20*	Agri-Mek *7/15*	Radiant *7/31*	~~Radiant~~		
Agri-Mek *6/20*	Radiant *7/15*	Agri-Mek *7/31*	~~Radiant~~		
Movento 6/20	Movento *7/3*	Radiant *7/22*	Radiant *7/31*	Agri-Mek *8/12*	Agri-Mek *8/22*

Season-Long Thrips Management Strategy

Effect on Thrips Population 2013



Insecticide Use for Thrips in the Klamath Basin



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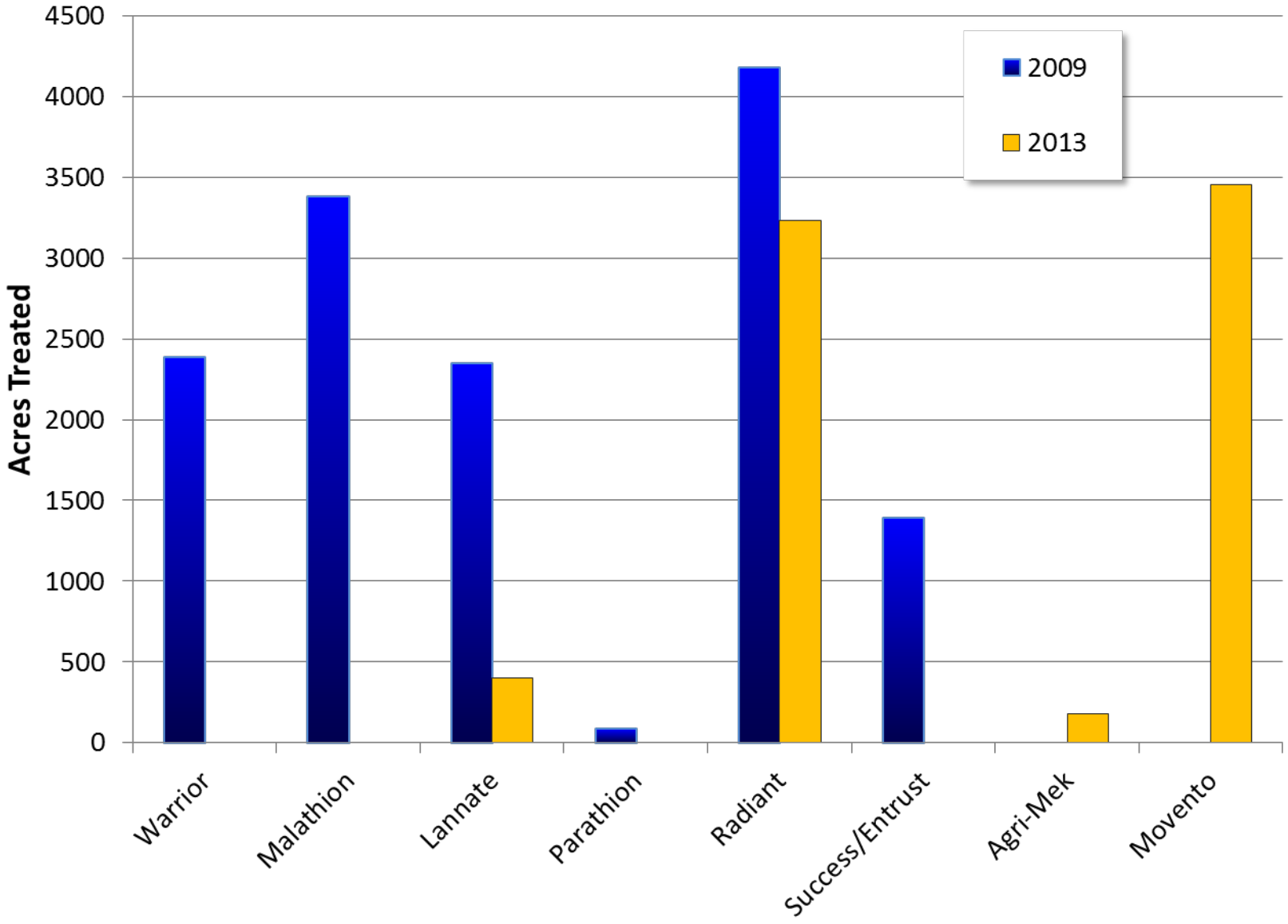


What is the effect of thrips on onion yield?

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

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

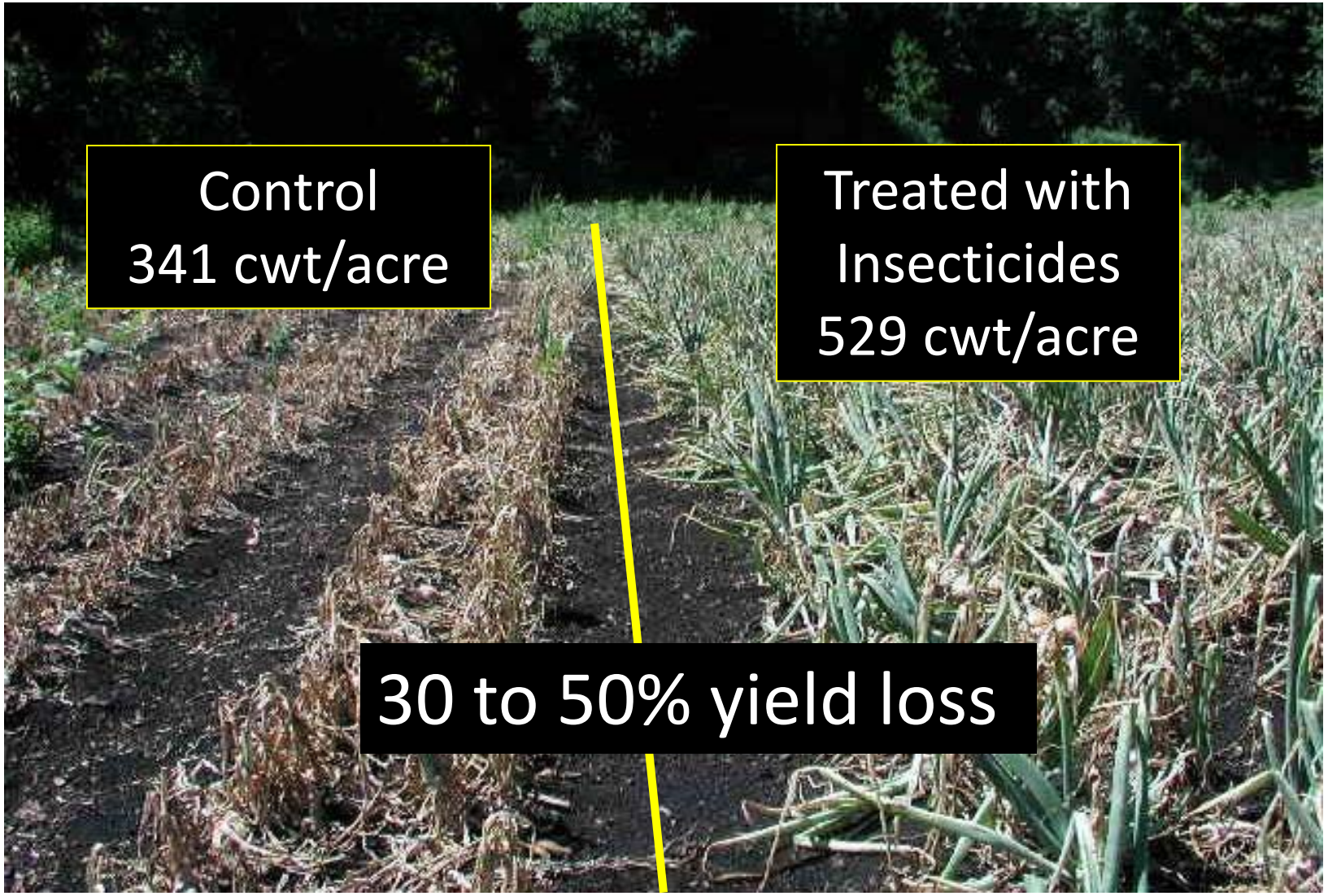
Season-Long Thrips Management

Effect on Yield 2013

1st Application	2nd Application	3rd Application	4th Application	5th Application	6th Application	Yield Tons/A
Untreated						28.4
Warrior	Warrior	Warrior				27.5
Mov/Lan	Radiant	Agi-Mek				28.6
Movento	Movento	Radiant	Radiant			27.4
Radiant	Movento	Movento	Radiant			28.3
Agri-Mek	Agri-Mek	Radiant	Radiant			28.9
Agri-Mek	Radiant	Agri-Mek	Radiant			27.7
Movento	Movento	Radiant	Radiant	Agri-Mek	Agri-Mek	28.3
						NS

Control
Radiant

Onion Thrips Damage in New York State



Treatment Threshold

- Calculate the average number of thrips per plant on two successive sample dates.
- Divide the average by the number of days between samples to get the number of thrips per plant per day or thrips-days.
- Add up the thrips-days on the sample day to get the cumulative thrips-days (CTD) during crop growth.
- Research indicates that significant yield loss occurs when 500 to 600 CTD or more accumulate.
- This is the equivalent of 50 to 60 thrips per plant per day for 10 days, 25 to 30 thrips per plant per day for 20 days, and so on.

Sequence of Insecticide Based on Action Threshold

Brian Nault

Application #	Product	Action threshold/timing of spray to consider
1	Movento	1 larvae/leaf
2	Movento	7 to 10 days after 1st Movento spray if needed
3	Agri-Mek	1 larvae/leaf
4	Agri-Mek	7 days after 1st Agri-Mek spray if needed
5	Lannate	1 larvae/leaf
6	Lannate	7 days after 1st Lannate spray
7	Radiant	3 larvae/leaf
8	Radiant	3 larvae/leaf

What We Have Learned

- Population and pattern varies 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
  - Lannate alone may not be good choice in season-long strategy
- Thrips per leaf may be better way to assess population
- Thrips do not have large impact on yield under conditions studied

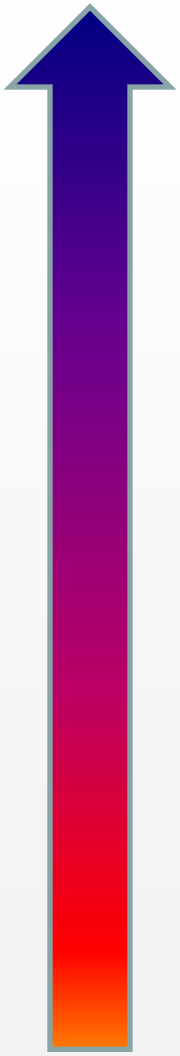
What We Would Still Want to Know

- Population dynamics
  - Factors that cause population to vary
  - What causes populations to crash in some years?
  - Prediction method
- Back-to-back applications of insecticides (other than Movento) superior?
- Why is Movento effective in Klamath Basin?
- Why do thrips populations surge after some insecticide applications?

What We Would Still Want to Know

- Best treatment approach
  - Treat early (small pop. easier to control)
  - Treat later (possibility of resurgence from early applications)
  - Best insecticide sequence
  - Interval between application
- Economic vs. Action threshold
  - Yield based threshold (maintain pop. below what level?)
  - Thrips per plant? Cumulative thrips-days (CTD)?
  - Thrips per leaf?
  - Vary by insecticide?
- Do we even need to treat (in the absence of other sensitive crops?

Hierarchy of Progressiveness



- Strawberry growers
- Vegetable growers
- Vine growers
- Fruit and nut growers
- Cotton growers
- Corn growers
- Alfalfa growers
- Small grain growers
- Cattlemen

Theoretical. For educational purposes only. Not intended to offend anyone.