Onion thrips research round-up from 2019

Empire State Producers EXPO
January 15, 2020

Karly H. Regan and Brian A. Nault

Department of Entomology
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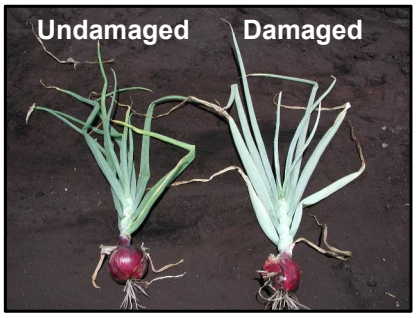
Onion thrips (*Thrips tabaci*)

- Major pest of onion
- Feeding reduces bulb weights 30-60%
- Vector of multiple plant pathogens



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Management of onion thrips

- ➢ Reliant on insecticide use
  - ✓ Effective
  - ✓ Economical

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Management of onion thrips

- **Multiple insecticides are available**
  - ✓ **At least 6 active ingredients and 6 IRAC classes**

DuPont™ Lannate® LV insecticide

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Information known about efficacy of insecticides for thrips control

- Movento (IRAC 23) is systemic and highly effective when plants are small (not great against adults; not very effective after bulbing) EARLY
- Agri-Mek SC (IRAC 6) is moderately effective; 30-d pre-harvest interval EARLY/ MIDDLE
- Exirel (IRAC 28) is moderately to highly effective MIDDLE/ LATE
- Minecto Pro (IRAC 6 & 28) is a premix of Exirel and Agri-Mek SC; 30-d pre-harvest interval EARLY/ MIDDLE
- Radiant SC (IRAC 5) reduces very high populations MIDDLE/ LATE
- Lannate LV (IRAC 1A) and Warrior II w/zeon tech. (IRAC 3A) are not effective individually, but provide moderate control in a tank mix LATE

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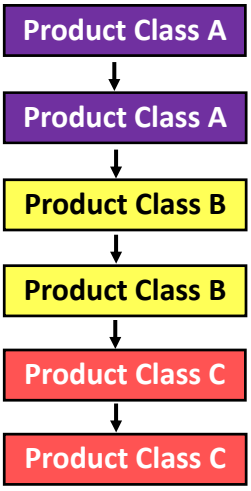
Insecticide Resistance Management (IRM) Principles



- Use a sequence of insecticides belonging to different classes

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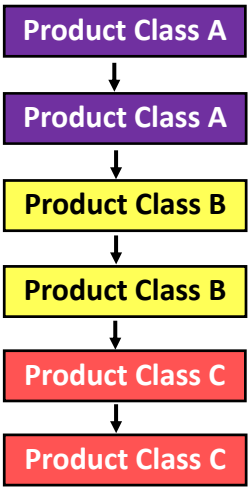
Insecticide Resistance Management (IRM) Principles



- Use a sequence of insecticides belonging to different classes
- Do NOT use the same product more than twice during the season and apply consecutively 7-10 days apart

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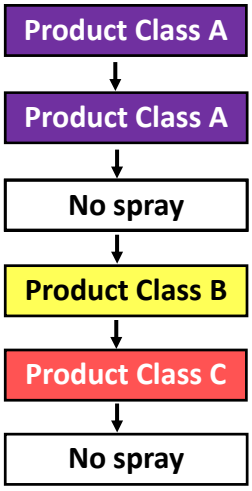
Insecticide Resistance Management (IRM) Principles



- Use a sequence of insecticides belonging to different classes
- Do NOT use the same product more than twice during the season and apply consecutively 7-10 days apart
- Scout fields and use an action threshold to determine whether or not to spray

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Guidelines for 2020 onion thrips management

- Assumes 6 insecticide applications within a growing season
- Assume action threshold of 1 thrips per leaf, unless specified otherwise

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Guidelines for 2020 onion thrips management

0.6-1 thrips per leaf; prebulbing

Movento

7-10 days

Movento

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7-10 days

Movento

- Assumes 6 insecticide applications within a growing season
- Assume action threshold of 1 thrips per leaf, unless specified otherwise

0.8-1 thrips per leaf → **OPTION A**

1-2 thrips per leaf → **OPTION B**

3-5 thrips per leaf → **OPTION C**

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Movento

7-10 days

Movento

0.8-1 thrips per leaf | 1-2 thrips per leaf | 3-5 thrips per leaf

OPTION A | OPTION B | OPTION C

Agri-Mek can be tank mixed with Warrior[2] if needed

Agri-Mek[1]

Agri-Mek[1]

≥ 3 thrips per leaf

Exirel → Exirel

Radiant → Radiant

[1] Agri-mek and Exirel should not be used in sequence with Minecto Pro

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Agri-Mek[1]

Agri-Mek[1]

Minecto Pro[1]

Minecto Pro[1]

≥ 3 thrips per leaf

0.8-1 thrips per leaf

Exirel → Exirel

Radiant → Radiant

Radiant → Radiant

Lannate +Warrior[2] → Lannate +Warrior[2]

[1] Agri-mek and Exirel should not be used in sequence with Minecto Pro

[2] Warrior II w/ Zeon technology

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Guidelines for 2020 onion thrips management

- Assumes 6 insecticide applications within a growing season
- Assume action threshold of 1 thrips per leaf, unless specified otherwise

¹ Agri-mek and Exirel should not be used in sequence with Minecto Pro
² Warrior II w/ Zeon technology

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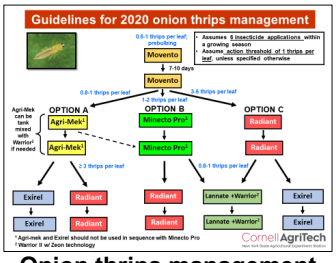
Management of onion thrips

- Onion fields scouted weekly for thrips
- Scouts convey results to growers
- Decisions made following guidelines

C. Hoepting

Muck Donut Hour in Elba



Onion thrips management program

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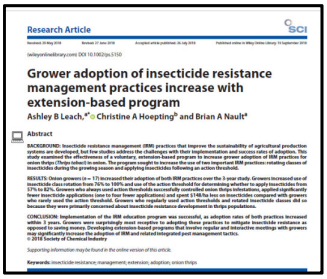
Management of onion thrips

- **Onion thrips management program has been successfully adopted**
  - ✓ **1-5 fewer sprays per field**
  - ✓ **Saved $60 per acre in insecticide costs**
  - ✓ **No resistance to Radiant, Movento and others**



Research Article

Grower adoption of insecticide resistance management practices increase with extension-based program

Ashley B Leach,[a]* Christine A Hoepting[b] and Brian A Nault[a]

Abstract

Elba onion growers received 2019 NYS IPM Award

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Management of onion thrips

Alternative control tactics?

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Management of onion thrips

Alternative control tactics?

➢ **Reducing fertilizer**

- **23-70% fewer onion thrips when N reduced**
  (Buckland et al. 2013, Malik et al. 2009)

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Management of onion thrips

Alternative control tactics?

➢ **Reducing fertilizer**

- **23-70% fewer onion thrips when N reduced**
  (Buckland et al. 2013, Malik et al. 2009)

- **Less bulb rot when N reduced**
  (Diaz-Perez et al. 2003, Pfeufer et al. 2018, Wright et al. 1993)

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Would reducing fertilizer reduce thrips infestations in NY?

In small-plot field trials

✓no reduction in thrips infestations when N and P were reduced

(Leach et al. 2017, Leach 2019)

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Would reducing fertilizer reduce thrips infestations in NY?

In small-plot field trials

✓no reduction in thrips infestations when N and P were reduced

(Leach et al. 2017, Leach 2019)

✓onion yield was similar despite reduction in N and P

(Leach et al. 2017, Leach 2019)

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Questions

Will reducing fertilizer reduce onion thrips populations, but not onion yield, in commercial fields?

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Questions

Will reducing fertilizer reduce onion thrips populations, but not onion yield, in commercial fields?

Will insecticide frequency (weekly sprays vs. action threshold-based sprays) impact onion thrips populations and onion yield?

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Objective

- To compare onion thrips control and bulb yield in onions grown using varying levels of fertilizer and different insecticide application frequency

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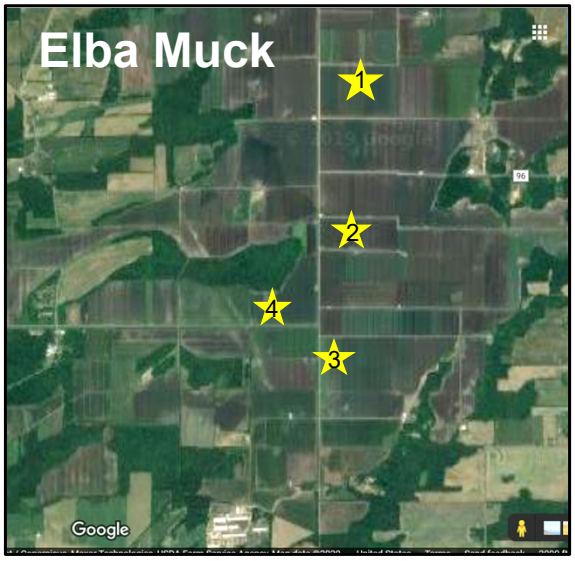
Methods



Four fields managed by three different farms in 2019

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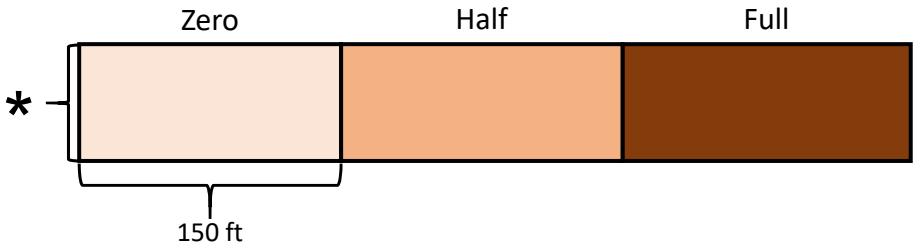
Methods
Fertilizer

Amount of fertilizer (N-P-K) applied in each field



*** Width of fertilizer spreader (≥ 30 ft)**

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Methods
Fertilizer

	Nitrogen		Phosphorus		Potassium	
	Half	**Full**	Half	**Full**	Half	**Full**
Fields 1 & 2 **Field 3** **Field 4**						
Recommended Rate	**100-125 lb/acre**		**50-150 lb/acre**		**50-150 lb/acre**	

2019 Cornell Vegetable Production Guide

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Methods
Fertilizer

	Nitrogen		Phosphorus		Potassium	
	Half	**Full**	Half	**Full**	Half	**Full**
Fields 1 & 2	63	**125**	70	**140**	72	**145**
Field 3	55	**112**	50	**100**	76	**152**
Field 4	45	**89**	75	**150**	100	**200**
Recommended Rate	**100-125 lb/acre**		**50-150 lb/acre**		**50-150 lb/acre**	

2019 Cornell Vegetable Production Guide

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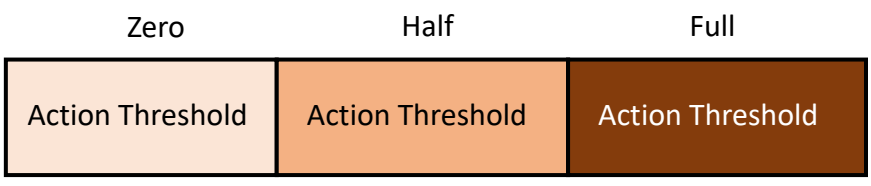
Methods
Insecticides



- Whole field sprayed if ≥1 thrips larva/leaf
- Informed by area scouting reports

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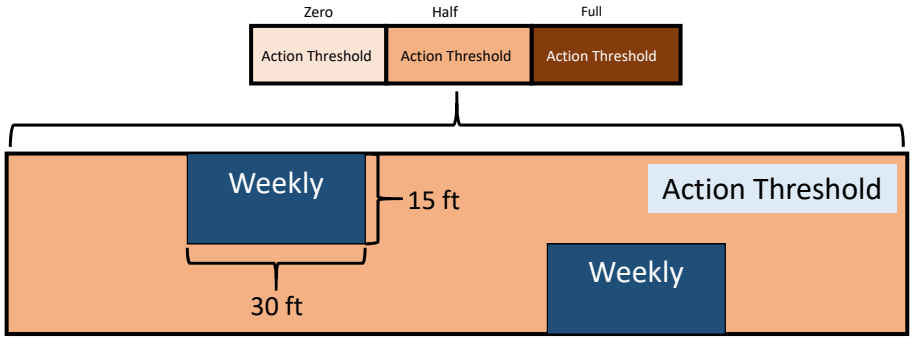
Methods

Insecticides



- Whole field sprayed if ≥ 1 thrips larva/leaf
- If grower didn't spray, we did in "weekly" subplots

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Results

Thrips

Fertilizer had no impact

Insecticide program did have an impact

No interaction between the two

Statistics

Effect	df	P value
Fertilizer	2,39	0.13
Spray Program	**1,39**	**<0.0001**
Fert * Spray	2,39	0.98

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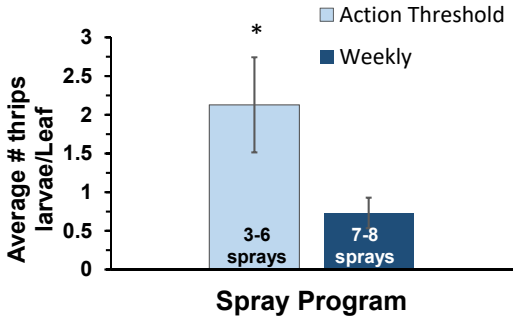
Results

Thrips



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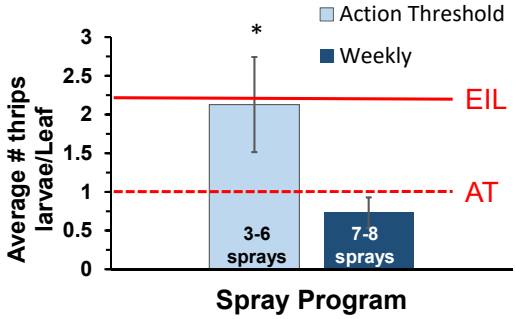
Results

Thrips

***Action-threshold program allowed 2-5 fewer sprays while maintaining below EIL**



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Results

Yield

Fertilizer had no impact!

Insecticide program had no impact!

No interaction between the two!

Statistics

Effect	df	P value
Fertilizer	2,39	0.60
Spray Program	1,39	0.09
Fert * Spray	2,39	0.66

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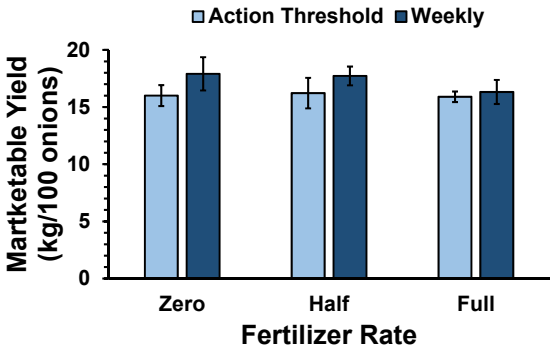
Results

Yield



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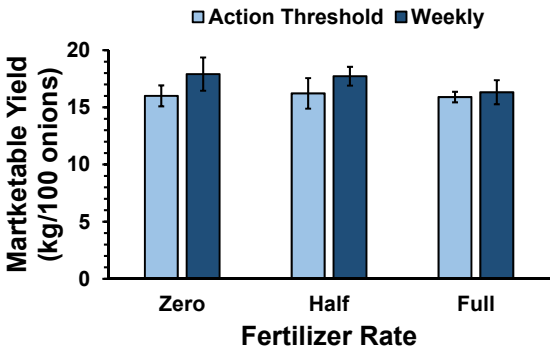
Results

Yield



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How different were soil nutrient levels mid-season?

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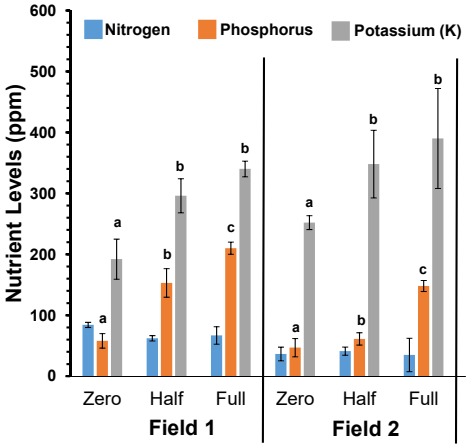
Results

Soil nutrient results



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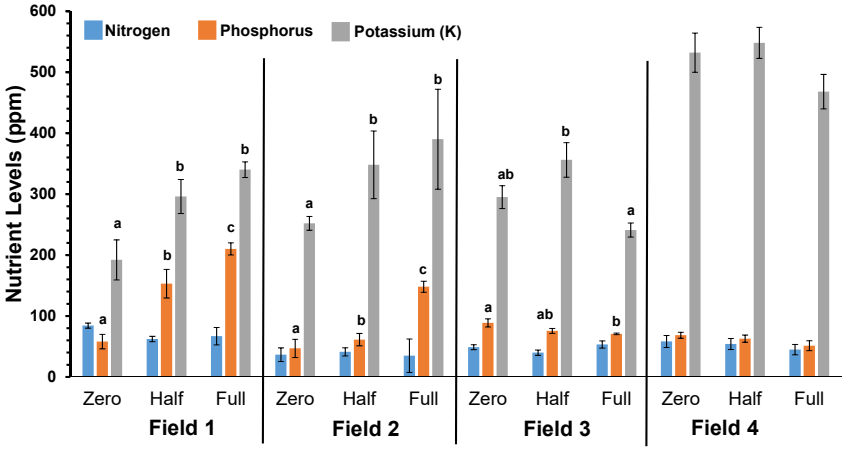
Results

Soil nutrient results



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Summary

- Fertilizer did not affect thrips populations or onion yield, even when none was applied

- Action-threshold based insecticide programs controlled thrips at an economically acceptable level, but with 2-5 fewer sprays

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