Thrips control in drip irrigated onions

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Relationship between thrips and IYSV

![Graph showing the relationship between thrips and IYSV disease severity.](image)

R² = 0.7005

Source: Jensen, OSU
Relationship between IYSV and yield

Source: Jensen, OSU
Thrips play a vital role in the spread of viruses

- Viruses can’t move by themselves
- They need a “safe” vehicle to spread from plant to plant
- Thrips control strategies are the best current option to disrupt the disease triangle
Where does this virus come from?

Inoculum sources:
1. biennial seed crops
2. spring-seeded bulb crops
3. fall-seeded bulb crops
4. Volunteers
5. Weeds

Photo courtesy of Mark Trent
Key question - When is the critical time to control thrips?
Constant adult pressure

Sticky Trap results in Parma 2011
Key question - When is the critical time to control thrips?

Data from OSU, Malheur Exp Station in 2006

IYSV symptoms appear during this period
How and when we apply insecticides may be more critical than what we apply.

- To be successful you must understand your target and where it is located.

Getting insecticides down close to the thrips is difficult!
How and when we apply insecticides may be more critical than what we apply

- **Water:**
  - Volume: What does it take to hit the target?
  - pH: Is it right for the product being applied?
  - What adjuvants to use?

- **Method:**
  - Ground vs Air vs Chemigation

**Remember:** Getting insecticides down close to the thrips is difficult!
Influence of spray volume on thrips populations
at Parma, ID during 2007 growing season

Values are means of 3 foliar insecticide treatments and 4 reps

1st application
June 22

2nd application
July 5
Impact of spray volume on IYSV incidence at Parma during 2007

Values are means of 3 foliar insecticide treatments
Know what the pH requirement is for the product being applied

- Find out what pH your water is and be ready to treat.
Adjuvant type and amount can be important!

Source: Nault et al., 2011
Tank mixes can impact product efficacy!

Values are means for two insecticide treatments

Source: Nault et al., 2011
How and when we apply insecticides may be more critical than what we apply.

- Water
- Method
- Interval between applications
  - Calendar (schedule)
  - By count (monitoring)

Remember: Getting insecticides down close to the thrips is difficult!
Interval between applications

Average thrips per plant

Source: Jensen, OSU
How and when we apply insecticides may be more critical than what we apply.  

- Water  
- Method  
- Interval between applications  
- Timing of first application  
  - Threshold of 1 to 3 per plant

Remember: Getting insecticides down close to the thrips is difficult!
Rotate modes of action, and start with “softer” chemistries.
Our only other weapon is to keep plants as healthy as possible!
Drip Irrigation:

Used on 33-40% of onion acreage in the Treasure Valley in 2011.

- Reduced erosion and uniform water distribution
- Holds the nutrients where you want them.
- Plant fields that do not have a history of onion production

Healthy plants that are less susceptible to virus infection
Potential Benefits to injecting treatments by drip irrigation

- **Efficiency**: Can apply an exacting amount without concern of losing product to runoff or air.
- **Safety**: Reduced exposure by not spraying the products in the air.
- **Potential to help maintain beneficial insects**: By not exposing them to the same products the targets are receiving.
Questions about injecting treatments by drip irrigation

- Plants ability to serve as the vehicle
  - Can the onion plant move the insecticide?
- Best chemistries for this method?
- Change in application intervals?
- Can a drip program substitute for all foliar treatments?
- Can we get it on the label?
DuPont- Recommendations

The product must be applied uniformly throughout the field

- Uniformity is regulated by the length of the injection period
- The minimum injection time is the time for water to move from the injection point to the most distant emitter.
- Longer injection times improve uniformity
- Minimum rinse time is equal to the minimum injection time.
Effect of Pulsing on Resultant Dye and Drip Water Distribution

“Bed X-Section on the Emitter”

Photo Courtesy of DuPont
Movement of soil mobile vs soil binding compounds

Both dyes highly soluble, red dye binds to the soil

Blue dye /a 0 hrs.
Red dye /a 3 hrs.
Blue dye /a 6 hrs
+ 2 hrs of water
= Total water run
  time 8 hrs.

Tape was here
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<thead>
<tr>
<th>Treatment</th>
<th>May 18th</th>
<th>June 4th</th>
<th>June 14th</th>
<th>June 23rd</th>
<th>July 1st</th>
<th>July 8th</th>
<th>July 11th</th>
<th>July 15th</th>
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<th>July 22nd</th>
<th>July 28th</th>
<th>Aug 1st</th>
<th>Aug 5th</th>
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<tr>
<td>Grower Standard</td>
<td></td>
<td>Movento @ 5oz/ac</td>
<td>Movento @ 5oz/ac</td>
<td>Agri-Mek @ 16oz/ac</td>
<td>Agri-Mek @ 16oz/ac</td>
<td>Radiant @8oz/ac</td>
<td>Radiant @8oz/ac</td>
<td>Lannate @3pts/ac</td>
<td>Lannate @3pts/ac</td>
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<tr>
<td>Admire drip + Grower Standard</td>
<td>Admire @ 14oz/ac</td>
<td>Movento @ 5oz/ac</td>
<td>Movento @ 5oz/ac</td>
<td>Agri-Mek @ 16oz/ac</td>
<td>Agri-Mek @ 16oz/ac</td>
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<tr>
<td>Non-Treated Check</td>
<td></td>
<td>No Spray all season</td>
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<tr>
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Question-
Can an exclusively drip applied program be effective?
2005 Vydate Trial – Huston, ID

![Graph showing thrips per plant over time with Vydate drip applications indicated.](image-url)

- **Thrips per plant**
  - Scale: 0 to 20
  - X-axis: Dates from 24-May to 28-Jun
  - Y-axis: Number of thrips per plant

**Graph Details:**
- **Check** (red line)
- **Vydate** (blue line)
- Significant increase in thrips count after Vydate drip applications on specific dates indicated by asterisks.

**Vydate Drip Applications**

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**Legend:***
Drip Program - Thrips levels by date

Drip applications started May 18
Drip Program - Seasonal Average - Thrips
Drip Program - IYSV Incidence Ratings

% Incidence IYSV

- Non-Treated Check
- Lannate-drip
- Vydate-drip
- Vydate fb Lannate-drip

August 2nd
- a
- ab
- a
- b

August 11th
- a
- bc
- a
- b
Relationship between thrips and IYSV

R² = 0.6313

Season avg thrips per plant

IYSV incidence (Aug 11)

Lannate drip treatments
Question-
Is a systemic product like Movento effective when drip applied?
Movento Drip vs. Foliar-Thrips levels by date
Movento Drip vs. Foliar-Seasonal Average-Thrips

The chart compares the season average thrips per plant between different treatments:
- Non-Treated Check
- Movento foliar + Grower Standard
- Movento drip + Grower Standard

The chart shows that the Non-Treated Check has the highest average thrips, while Movento drip + Grower Standard has the lowest.
Movento Drip vs. Foliar-IYSV Incidence Ratings

% IYSV Incidence

August 2nd

August 11th

Non-Treated Check
Movento foliar + Grower Standard
Movento drip + Grower Standard
Movento Drip vs. Foliar-Yields (cwt/ac)
Question-
Do early season insecticide applications improve thrips control?
Early Season Treatments - Thrips levels by date

Admire applied on May 18
Early Season Treatments-
Seasonal Average- Thrips
Early Season Treatments - IYSV Incidence Ratings

% IYSV Incidence

August 2nd

August 11th

- Non-Treated Check
- Grower Standard
- Admire drip + Grower Standard
- Sepresto + Grower Standard
Early Season Treatments - Yields (cwt/ac)

- Non-Treated Check: b
- Grower Standard: ab
- Admire drip + Grower Standard: ab
- Sepresto + Grower Standard: a

Legend:
- Total Yield
- Jumbo Yield
Question:
Does a drip program help out the beneficial insects?
Beneficial insects

Totals per 5 plant sample

Foliar programs

- Mvento drip + Grower Standard
- Admire drip + Grower Standard
- Grower Standard
- Sepresco + Grower Standard
- Lannate-drip
- Non-Treated Check
- Vydate fb Lannate-drip
- Vydate-drip
In Summary

- How well do drip programs work? - Not sure, need to refine application method
- Do systemic products work as well through drip? – Potentially works well- need another look.
- Can foliar thrips control be improved by early season insecticide applications? Did not see the difference directly, but yields improved some.
- Do drip applications preserve beneficial insects? – Yes……but the difference may not be enough to impact thrips populations
- Lengthen out our treatment injection time to better simulate commercial application
- Get another look at Movento by drip to see if it can duplicate its results from 2011
- Continue to evaluate beneficial insect levels in the drip treatments
Thank you

Are there any questions?