

Cultural Management of Onion Thrips and Iris Yellow Spot Virus

Jennifer Reeve (Utah – Research & Education Grant)

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Title: Cultural Management of Onion Thrips and Iris Yellow Spot Virus

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Situation:

Iris yellow spot virus (IYSV) and onion thrips threaten sustainable, profitable onion production in Utah and the Western United States.

Onion growers in Utah rely on high risk insecticides for thrips management, which has increased insecticide use and may increase the severity of IYSV outbreaks.

Little is known about how to effectively manage IYSV – whether cultural practices affect its spread and whether more intensive thrips insecticide programs reduce its incidence or severity.

Objectives:

1. Work with local growers to determine onion thrips and IYSV pressure in primary Utah onion areas and correlate IYSV pressure to common farm practices
2. Determine the effects of crop and pest management strategies on thrips survival and population sizes
3. Evaluate nitrogen (N) inputs, N leaching potential, alternative fertilizers, trap crops and rotation on thrips, IYSV, onion yields and storage quality
4. Conduct grower workshops and field days on control options of onion thrips and IYSV
5. Conduct economic and cost-benefit analysis of proposed changes to management of onion thrips and IYSV
6. Disseminate results through extension bulletins, the Internet, trade journals and scientific literature



Sampling an onion field for IYSV



Preparing to freeze dry onion samples for IYSV testing.

Actions:

IYSV Diagnosis

To date, 4,500 samples of mostly onions and some weeds have been tested to determine the host range, incidence and severity of IYSV in and around onion fields. Considerable variation between fields was detected. So far, only three species of weed have tested positive for IYSV.

Thrips Evaluation

Despite a slow start in the 2008 season, thrips populations rose above normal. Sampling has been completed for thrips on plants, thrips in air (aerial sticky trap), eggs per leaf and hatched eggs per leaf. The data are being counted and organized.

Soil and Plant N

Soils and onions were sampled monthly from April to September and soil and tissue N tested. Onions have been collected from all seeded onion fields for storage trials.

Kaysville Experiment Station

Wheat and corn plots were established this spring and fertility treatments applied.

Morgan Reeder Farm

An important part of the project is to evaluate the practices adopted by grower-cooperator Morgan Reeder, who has not sprayed for onion thrips for the past three years. Reeder's practices include:

- A 50% reduction in N input
- A corn versus wheat rotation
- Use of 'MoreLife' as a bio-stimulant

To experimentally evaluate Reeder's practices as well as determine the effects of trap crops on thrips and IYSV, two replicated field trials will be conducted in years two and three:

- Crop rotation and N management on 1.68 acres at the USU Kaysville Experiment Station
- Effectiveness of trap crops (carrot, buckwheat and lacy phacelia) in luring thrips away from onions on Reeder's northern Utah farm

Educational Activities (planned)

- A digital image gallery of onion plant growth, health and pest symptoms
- A web-based onion crop and pest advisory
- Extension fact sheets and scientific papers



Harvesting onions for grading and storage trials.



Sampling soil and plant tissue for N content.

Results:

During an August 12 field day, attended by 55 onion growers and extension personnel, the project team introduced the project and presented the idea of a whole-farm approach to onion thrips and IYSV management. IYSV field identification and thrips sampling techniques were demonstrated.

Early results from summer 2008 activities will be presented at winter meetings.



A sticky trap and jar of soapy water, used to monitor thrips.



Typical IYSV lesions with three thrips feeding sites visible in the center.

Potential Benefits:

This project and its outreach and educational activities will help growers:

- Improve skills in identifying IYSV in the field
- Become more aware of alternative weed and crops hosts for pests and IYSV
- Learn about the need for integrated solutions

The replicated field trials will improve understanding of how plant nutrient status, crop rotations and trap crops interact with or alter onion thrips feeding habits and movements. This will help in developing production strategies that minimize thrips predation and IYSV infection and spread.

Improved nitrogen management will help reduce N leaching to the environment, and reduced insecticide use will cut grower expenses.



Sticky trap demonstration at a field day.



Project overview presented at summer field day August 12, 2008.