Onion Disease Management

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Imperial County
Downy mildew
Downy mildew

*Peronospora destructor*
Onion Downy Mildew
*Peronospora destructor*

- **Host range:** many Allium species (including, onions, garlic, chives and shallots)
- **Pathogen over-winters in onion bulbs and as oospores in debris from diseased foliage.**
- **Sporangia can be carried long distances on air currents.**
Disease development

- Favorable environmental conditions:
  - Cool temperatures (43° to 80°F)
  - Moisture (1.5-7 hours of leaf wetness)
  - Low light

- Spores are produced at night and are dispersed during the day.

- The spores can survive for up to 3 days

- Nine to 16 days between infection and sporulation
Disease control

- Do not plant infested bulbs
- Likelihood of disease is lower in fields with air movement
  - Well drained fields
  - Lower plant densities
  - No windbreaks
- Frequent fungicide applications when conditions favor disease development
Fungicide efficacy, Imperial County 2003

- Imperial Valley Research Center, Brawley
- Dehydrator onions were grown according to commercial practice
- Experimental design
  - Six replication RCB
  - Plot size: 4 rows x 30 ft
- The first sign of downy mildew was observed on 11 March
Application details

- CO\textsubscript{2}-pressurized backpack sprayer (30 gal/acre)
- Applications were made before disease was observed
<table>
<thead>
<tr>
<th>Treatment, units/acre</th>
<th>Application dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-10</td>
</tr>
<tr>
<td>Acrobat 50WP 6.4 oz (A)</td>
<td></td>
</tr>
<tr>
<td>Pristine 1.45 lbs (P)</td>
<td></td>
</tr>
<tr>
<td>Acrobat 50WP 6.4 oz + Cabrio 1.0 lbs</td>
<td>X</td>
</tr>
<tr>
<td>Acrobat 50WP 6.4 oz</td>
<td>X</td>
</tr>
<tr>
<td>Ridomil Gold Bravo 2.0 lbs (R) : Maneb 75DF 3.0 lbs (M)</td>
<td>R</td>
</tr>
<tr>
<td>Maneb 75DF 3.0 lbs</td>
<td>X</td>
</tr>
<tr>
<td>Quadris 15.4 fl oz</td>
<td>X</td>
</tr>
<tr>
<td>Ridomyl Gold Bravo 2.0 lbs</td>
<td>X</td>
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<tr>
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Results
Results

<table>
<thead>
<tr>
<th>Ap #</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2-10</td>
</tr>
<tr>
<td>2</td>
<td>2-14</td>
</tr>
<tr>
<td>3</td>
<td>2-28</td>
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<tr>
<td>4</td>
<td>3-11</td>
</tr>
<tr>
<td>5</td>
<td>3-22</td>
</tr>
</tbody>
</table>

- Untreated Control
- Quadris (2,3,4,5)
- Acrobat (2,3,4,5)
- Acrobat + Cabrio (2,3,4,5)
- Acrobat (2,4) / Pristine (3,5)
- R G B (2,3,4,5)
- R G B (1,3,4,5)
- Maneb (2,3,4,5)
- R G B (1,4) / Maneb (3,5)
Iris yellow spot virus of onion

Imperial County
Iris yellow spot virus of onion

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Iris yellow spot virus of onion

Sample from Yuma
Iris yellow spot virus of onion

Idaho
Distribution of Iris yellow spot virus

- Previously reported in Netherlands, Israel and Brazil.
- Lesions were reported on onion in Yuma in 2002-3, and were widespread throughout Imperial County in 2003.
Biology

- **Host Range**: Iris, Jimsonweed, green onion, chives, bulb onion.

- The virus has not been detected in seed or bulbs.

- Onion thrips (*Thrips tabaci*) transmit this virus: Western flower thrips (*Frankinella occidentalis*) does not appear to be a vector.
Symptoms

- The characteristic lesions were rarely reported on leaves until recently.

- In 2001, necrotic lesions leaves of onion bulb and seed crops, and these were confirmed to be infected with IYSV in Colorado, Idaho and Utah.
Economic loss

- In most infected fields, seed yield reduction is minimal, but there are isolated reports of severely affected fields that were not harvested.

- Reports from Colorado, Israel and Brazil claim substantial yield losses to bulb onion.
Control of Iris yellow spot virus

- In variety trials in Idaho, there were differences in symptom severity, but further research is needed before any conclusive statement could be made.