ONION DISEASE MANAGEMENT

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Monitor Pests and Diseases in Relation to Crop Growth Stages

Priority 1 - IYSV & Thrips
Monitor Pests and Diseases in Relation to Crop Growth Stages

Priority 2 - Other Diseases & Pests

- Fungal
- Bacterial
- Insects
- Post-Harvest
Soil-borne Threats: Planting to Harvest & Storage
Common Name: Pink Root

Scientific Name: *Phoma terrestris*

Pathogen Type: fungus

Survival Means: spores, pycnidia, crop debris, sets
**Common Name:** Fusarium Basal Rot

**Scientific Name:** Fusarium oxysporum f. sp. cepae

**Pathogen Type:** fungus

**Survival Means:** spores, crop debris, sets
Varietal Resistance – choose carefully

Transplants / Sets

Pelleted Seed

Raw Seed
Varietal Resistance
Pesticides - preventive

Options:

Preplant Treatments
Telone C-17, C-35
Vapam

Seed Treatments - damping off
Apron
Biopesticides
Captan
Maxim
Quadris
Thiram
Others

Onion Diseases
Fungal (soilborne)
Fumigation Effect – % Improvement Over Control

1984-85 at Olathe & Kersey, CO / [Schwartz 1986 F & N Tests 41:57]

Plant Stand Improvement

Kersey - C17

Olathe - C17

Olathe - Vapam
FUMIGATION EFFECT – % IMPROVEMENT OVER CONTROL
1984-85 at Olathe & Kersey, CO / [Schwartz 1986 F & N Tests 41:57]

% Fusarium (& PR) Reduction

- Kersey - C17
- Olathe - C17
- Olathe - Vapam
Fumigation Effect – % Improvement Over Control

1984-85 at Olathe & Kersey, CO / [Schwartz 1986 F & N Tests 41:57]

% Yield Increase

Kersey - C17  Olathe - C17  Olathe - Vapam

Fumigation Cost = $350/A; Net Return @ $10/cwt = $2850 for C17 & $170 for Vapam at Olathe
Cultivation – minimize wounds, compaction
Fertilizing – moderate & balanced

Soil / Foliage Tests

Split Applications
Irrigating – avoid extremes

Drip

Sprinkler

Surface
SOILBORNE DISEASE MANAGEMENT

Disease Management:

- rotate with non-susceptible crops for > 4 years
- plant Fusarium / Pink Root resistant varieties
- use moderate fertility + irrigation scheduling
- avoid root pruning and other stresses (salinity, herbicide damage, compaction)
- store cured bulbs at low temperature
ONION DISEASE MANAGEMENT
STORM DAMAGE
Bulb Growth Stages of Onion

Allium cepa L.

Foliage Recovery

New Leaf Emergence

Leaf Integrity

Varietal Response

Disease

Neck Integrity
MARKETABLE YIELD - % OF UNDAMAGED CONTROL


Defoliation
- 33%
- 67%

Days Before Maturity

Late Bulb

Early Bulb
Monitor Pests and Diseases in Relation to Crop Growth Stages

Priority 2 - Other Diseases & Pests

Fungal

Bacterial

Insects

Post-Harvest
IPM Components

- Scouting
- Pest Biology
- Culls
- Volunteers
- Monitoring
- Forecast Models
- Pest Biology
Pesticides – timely if needed

Ground Rig

Aerial

Herbicide
Insecticide
Fungicide
Bactericide

Chemigation
### Pesticide Options:

- **Actigard**
- **Biopesticides**
- **Cabrio**
- **Chlorothalonils**
- **Coppers (bacterial diseases)**
- **EBDCs**
- **Endura**
- **Forum**
- **Quadris**
- **Quilt**
- **Pristine**
- **Reason**
- **Ridomil Gold**
- **Rovral**
- **Scala**
- **Switch**
- **Tanos**
- **Etc. – check local & federal labels**

### Onion Pesticide Summary

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>PHI</th>
<th>Bacterial/Viral Complex</th>
<th>Downy Mildew</th>
<th>Purple Blotch</th>
<th>Botrytis (Neck rot/blast)</th>
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<tbody>
<tr>
<td>Actigard (Acibenzolar)</td>
<td>7</td>
<td>Xanth/YSV</td>
<td>Suppression</td>
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<td>Acrobat (Dimethomorph)</td>
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<td>Agri-Fos (Phosphorous Acid)</td>
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<td>Aliette (Fosetyl-A)</td>
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<td>Cabrio (Pyraclostrobin)</td>
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<td>Chlorothalonil1</td>
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<td>Copper-based Bactericides1</td>
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<td>EBDCs3</td>
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<td>Endura (Boscalid)</td>
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<td>Folicur (Tebuconazole)</td>
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<td>Fontelis (Penthiopyrad)</td>
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<td>Forum (Dimethomorph)</td>
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<td>Ipodione4 (Dicarboximide)</td>
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<td>Pristine (Cabrio + Endura)</td>
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<td>Quilt (Propiconazole + Azoxystrobins)</td>
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<td>Reason (Fenamulone)</td>
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<td>Revus (Manipropamid)</td>
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<td>Ridomil Mix (Metalaxyl)5</td>
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<td>YES (+ copper)</td>
<td>YES (+ EBDC or Bravo)</td>
<td>YES (+ EBDC or Bravo)</td>
<td>YES (+ EBDC or Bravo)</td>
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<td>Scala (Pyrimethanil)</td>
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<td>Switch (Cyprodinil)</td>
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<td>Tanos (Famoxadone + Cymoxanil)</td>
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<td>Tilt / Propimax (Propiconazole)</td>
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<td>Suppression</td>
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<td>Vanguard (Cyprodinil)</td>
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</table>

Updated pesticide information is available at: [wiki.bugwood.org/HPIPM/Onion](wiki.bugwood.org/HPIPM/Onion)
ONION BACTERIAL DISEASES

DISEASE MANAGEMENT

Colorado State University, 1998/99

% Disease Reduction % Increase
[ Untreated check: disease intensity = ratings during August to September, yield estimate taken mid September; Xanthomonas Leaf Blight + Pantoea Blight ]
Contaminated plant material, soil, water

Timing/severity of damage – wind, rain, hail

Mechanical wounds – storm, insects, cultivation

Irrigation - runoff, excess, center pivot

Over-fertility, especially post-bulb & post-damage

Moderate to high temperatures (> 86°F)

Topping, curing, storage practices
Monitor Pests and Diseases in Relation to Crop Growth Stages

Priority 1 - IYSV & Thrips
IYSV-infected Onion Volunteers
Role & Source of Onion Thrips?

Symptomatic volunteers observed in field corn, alfalfa, carrot, fallow, winter wheat, and dry bean rotational crops
During 2004 - 2007, transplants from southwestern states arrived with contamination before they were planted in Colorado fields:

- >50% of the sources were IYSV positive (0.4 to 5.0%)
- 18% (2004), 91% (2005) and 100% (2006 & 2007) carried thrips (up to 1 thrips per seedling/bundle); many were *Thrips tabaci*, *Frankliniella occidentalis*, *F. ewarti*, *F. schultzei*

[I. Mahaffey & W. Cranshaw, entomologists]

IYSV incidence varies among cultivars from a source

- Red market class cultivars were infected most often
Surveys in 2004 - 2007 of common weed species in and around onion fields with a history of IYSV in Colorado detected a variable incidence of the virus in asymptomatic plants of:

- redroot pigweed (2%)
- Kochia (3%)
- common purslane (0-88%)
- flixweed (6%)
- sow thistle (100%)
- gray rabbit brush (56%)
- Buckhorn plantain (86%)
- red stem filaree (23%)

Subset of 17 **yellow entries** common to the 3 tests with moderate to severe IYSV outbreaks:

- 8 yellow entries had **green leaf** color with
- >10% lower incidence of IYSV
- and 33% higher marketable yield
- than 9 yellow entries with **blue-green leaves**
Thank you