

**Onion IPM Highlights** by H. F. Schwartz, Colorado State University (2014)  
*Sponsored by the Colorado Onion Association and CSU Agr. Exp. Sta. / Ext. Projects*

**Scouting and Production Strategies:**

Early detection of pest problems is a key element of an integrated pest management program. The onset and spread of diseases and insects are closely linked to weather patterns. By monitoring weather information and forecasts, a pest problem may be predicted and dealt with in a timely and efficient manner. Rather than spraying on a weekly or monthly basis without regard to pest pressure, growers strive to make applications only when a problem is present and when it is economically and biologically prudent to do so.

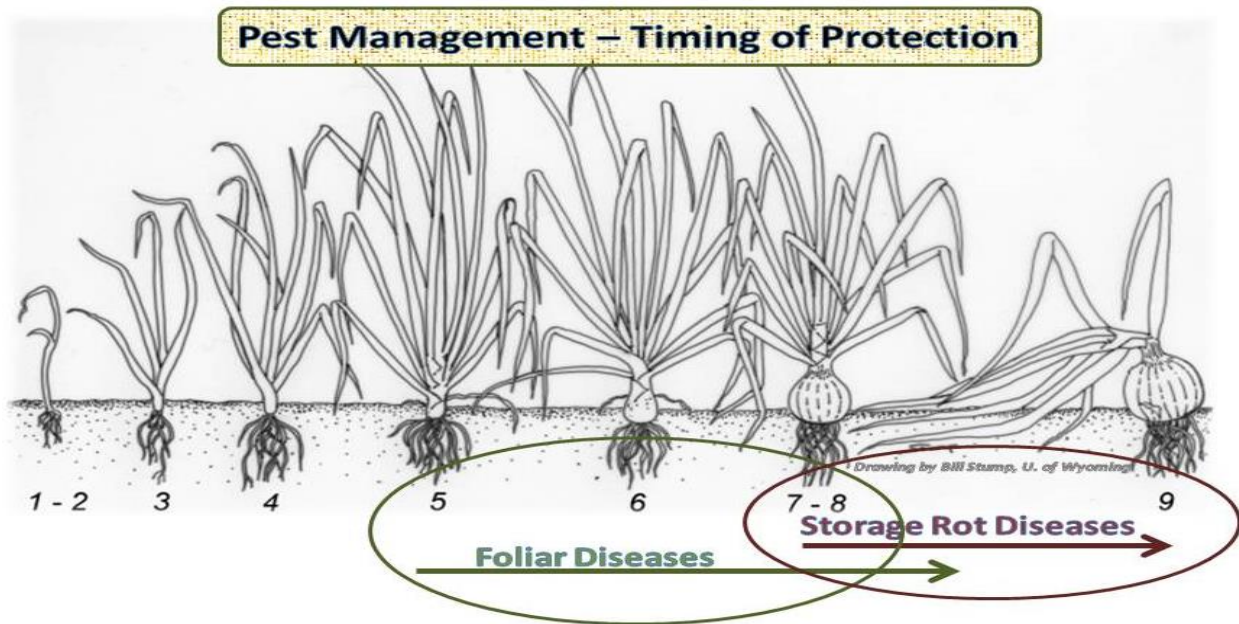
Monitor development of the onion crop during the following growth stages, and implement pest and disease management protection according to the following diagram if pests and diseases threaten during foliar development to bulbing and into storage. Bacterial and fungal disease protection during foliar stages should cover **Growth Stages 5 to 8**, and protection during late season (and into storage) should cover **Growth Stages 7 to 9**.

**Pre-Bulb Growth Stages**

- 1 – radical and flag leaf emergence (10-30 days post seeding)
- 2 – one to two true leaves (30-50 days p.s.)
- 3 – three to four leaves (50-70 days p.s.)
- 4 – five to seven leaves (70-90 days p.s.)
- 5 – eight to 12 leaves, bulb initiation (90-110 days p.s.)

**Post-Bulb Growth Stages**

- 6 – bulb diameter of 1 to 1.5 in (110 to 130 days p.s.)
- 7 – bulb diameter of 1.5 to 3 in (130 to 150 days p.s.)
- 8 – bulb diameter greater than 3 in (150 – 170 days p.s.)
- 9 – bulb enlargement complete, greater than 50% cropped to dry down (more than 170 days p.s.)



- Consult chemical labels, adjuvant options, crop consultants, and updated guidelines for specific pesticides and application rates; and regularly calibrate pesticide application equipment to ensure proper and accurate delivery.
- Apply copper-based bactericides + EBDCs + adjuvant for bacterial diseases; and rotate different classes of protectant and/or systemic fungicides labeled against specific fungal disease(s).

**Resources and Links:**

Onion Pest & Disease Diagnostics: <http://www.colostate.edu/Orgs/VegNet/vegnet/onions.html>  
 Onion Fungicide Table: <http://www.colostate.edu/Orgs/VegNet/vegnet/onionpesticide.html>  
 High Plains Guide - Onion Pests & Diseases: <http://wiki.bugwood.org/HPIPIM:Onion>



**Strengthen Your IPM Success & Net Return:** Critically review production inputs to build on the gains that you have already made with your season-long pest and disease protection.

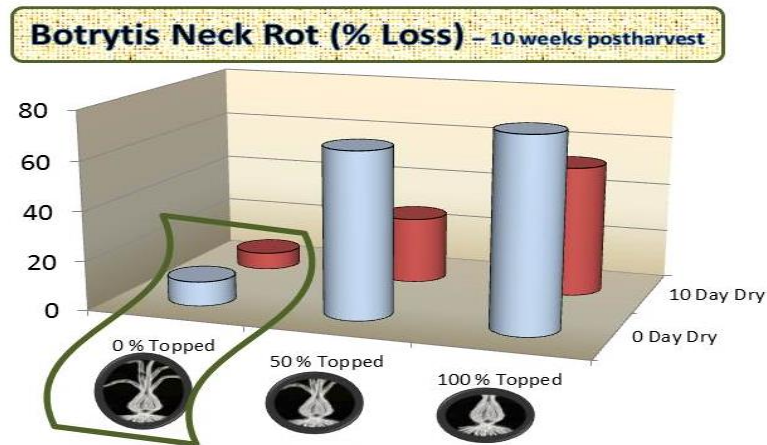
**Cultural Practices:** Avoid root and foliar damage from herbicide applications and mechanical cultivation.

**Fertilizer & Timing:** Moderate rates of fertilizer (especially nitrogen < 250 lb/A) can reduce severity of foliar and storage losses from bacterial and fungal diseases and insect pests. Split applications are strongly recommended before bulbing to avoid overly-succulent foliage, soft bulbs, and nutrient leaching late in the season.

**Irrigation Water:** Avoid late-season irrigation of onions, especially by sprinkler after cropping when tops are dry and can wick water into bulbs to aggravate infection by bacterial and fungal pathogens in the field and storage.

**Harvest Practices:** The following figure illustrates the effects of removing too much foliage (50 - 100% topped) and improper curing (0 days) of tops and necks in the field and storage. The most effective treatment is to completely dry the foliage and neck region before topping and exposing the bulbs to pathogens in the debris, soil, water and air.

**Storage Practices:** A bulb with thoroughly dried neck tissue and outer scales cannot be easily invaded by pathogens in the field, and will have a longer storage and marketplace life. Maintain a well-ventilated storage system at 32 – 40°F with moderate humidity near 70%. Bulbs infected in the field will continue to deteriorate in storage.



### Onion Integrated Pest Management Tactics:

- Rotate to exclude susceptible hosts (i.e., onion volunteers, weeds) for 3 + years; examples of non-host crops include small grains and corn.
- Avoid planting in fields with a history of disease during the last 3 years or near cull piles.
- Plant resistant or less susceptible varieties if available.
- Follow recommended plant populations based on in-row and between-row plant spacing.
- Test the soil and use a moderate fertility program. Do not apply high rates of nitrogen post-bulb as this can aggravate losses from thrips and diseases (fungal, bacterial).
- Incorporate fall and/or spring tillage to eliminate carryover debris, cull piles and volunteer onions (bulbs) in the previous year's onion fields.
- Promote root health and good soil drainage. Assure good air flow between onion lines and rows in the field.
- Monitor irrigation scheduling to avoid splashing and canopy saturation over prolonged periods.
- Utilize scouting, disease forecasting, and weather monitoring services.
- When justified, use timely applications of recommended fungicides at the late vegetative growth stage, and maintain protection throughout bulbing until cropping and dry-down.
- Cure onion tops well in the field, and keep bulbs dry and cool in storage with adequate ventilation.