

Onion

Bacterial Soft Rot

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Identification and Life Cycle

Bacterial soft rot is commonly caused by *Erwinia carotovora* subsp. *carotovora* (synonym for *Pectobacterium carotovorum* subsp. *carotovorum*) or *E. chrysanthemi* (synonym for *Dickeya chrysanthemi*). The bacterial soft rot pathogens have very broad host ranges and can attack many vegetables including carrot, potato, cabbage, and lettuce. Infection generally requires a wound caused by heavy, wind-driven rain, hail, insects, or cut necks at harvest. Splashing water, aerosols, contaminated equipment and workers, and insects spread soft rot bacteria. Bacterial soft rot pathogens are commonly found in and easily disseminated by irrigation water. *Erwinia* spp. survive between onion crops in soil, crop debris, and pathogenically on other crops.

Plant Response and Damage

Bacterial soft rot symptoms often appear as a soft, watery rot of individual scales that may advance and rot the entire bulb. A foul-smelling viscous fluid oozes from the neck when infected bulbs are squeezed. In the field, the youngest leaves or the entire foliage of affected plants appear bleached and wilted. Yield losses can be significant in the field and storage.

Management Approaches

Biological Control

No biological control strategies have been developed for bacterial soft rot.

Cultural Control

Practice a three-year or longer rotation to nonhosts such as small grains. Avoid reuse of irrigation tail water and overhead irrigation. Prevent bruising and wounding of plants and bulbs during field operations, harvest, and handling. Control onion maggots and other insects that can vector soft rot bacteria. Sever all roots during lifting to promote rapid drying of foliage and necks before topping. Cure bulbs with abundant ambient air until

necks are completely dry before storing bulbs at 32 to 36°F and 70% or less relative humidity.

Chemical Control

Copper bactericides provide some bacterial control in Colorado when applied before disease is observed. Sprays should be initiated two weeks before bulb initiation, and continued on a 5 to 10 day spray interval depending on weather conditions. Apply in a sufficient volume of water to ensure thorough coverage. Include a low rate of a non-ionic surfactant to further improve coverage.

Copper tolerant strains of the pathogens are common in the U.S. Tank mixing copper bactericides with a low rate of an EBDC fungicide such as maneb is essential for effective disease suppression. Tank-mixing coppers with zinc or iron can also enhance their activity.

Product List for Bacterial Leaf Blights; these may reduce Soft Rot:

Pesticide	Product per Acre	Application Frequency (days)	Remarks
Copper-based Fungicides—not all formulation listed			
Champ DP	1.33 lb	7-10 days	
Cuprofix	2.5-6 lb	7-10 days	Can be phytotoxic
Cuprofix MZ	5-7.25 lb	3-7 days	Maximum of 78.9 pounds per season; 7 day PHI
Kocide 2000	1.5 lb	7-10 days	Can be phytotoxic to leaves
Kocide 3000	0.75 lb	7-10 days	Can be phytotoxic to leaves
ManKocide	2.5	3-7 days	Maximum of 160 pounds per season; 7 day PHI
Nordox	2-4 lb	7-10 days	
NuCop 50WP	2.0 lb	7-10 days	
Top Cop with S	2-3 qt	7-10 days	

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