

Soft rot diseases in allium

Erwinia carotovora subsp. *carotovora*, *Erwinia chrysanthemi* and other soft rot bacterial pathogens

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Soft rot diseases in allium are commonly caused by *Erwinia carotovora* subsp. *carotovora* or *Erwinia chrysanthemi*, but incidentally also by species belonging to the genera *Pantoea*, *Bacillus*, *Pseudomonas* (*P. gladioli*), *Clostridium*, *Enterobacter* (*E. cloacae*) and *Flavobacterium*.

Symptoms and damage

Symptoms often appear just before or at the time of harvest or at storage

On foliage

- The youngest leaves of affected plants appear bleached and wilted

On bulbs

- Initially, a soft, watery rot of individual scales, and a yellow discoloration of the affected tissue appear.
- Later the entire bulb may rot (Fig. 2). A brown discoloration may appear that progresses lengthwise in the infected bulbs (Fig. 3)
- Upon squeezing, a bad-smelling viscous fluid ooze leaves from the neck

Disease development is favored by heavy rain, creating anaerobic conditions in the field and by temperatures between 20 and 30 °C Yield losses can be significant both in the field and storage. In Indonesia, up to 17% of the shallot bulbs in the fields were found affected.

Survival and dissemination

- The primary sources of inoculum are planting material, soil and crop residues
- Soft rot pathogens have a very broad host range
- the pathogen is spread by rain, irrigation water and insects
- Infection requires wounds that are caused by wind driven rain, cultural practices (mechanical injuries) or insects.

Prevention and cure

Cultural practices

- Use certified pathogen-free planting material
- Produce planting material in arid or semi-arid areas or in the dry season
- Allow onion tops to mature before harvest
- Avoid the use of overhead irrigation; drip irrigation is preferred.
- Destroy weeds, or other plants that can serve as a host
- Strive to maintain a balanced fertility. A high nitrogen content seems to enhance symptom development whereas a high calcium content makes plant less susceptible.
- Carry out adequate sanitation in greenhouses used for transplant production. Clean equipment and tools with a disinfectant.
- Avoid bruising of bulbs during harvest and handling
- Destroy or removed diseased plants and crop debris. Compost debris well (deep plowing)
- Store bulbs at a low temperature (4 °C) and 65-70% RH
- Use tolerant cultivars

Chemical control

- A fixed-copper fungicide (e.g. Kocide 2000 and Mankocide (Griffin Corp.) may be used, although this will only slow down the disease. Sprays should be initiated two weeks before bulb initiation and continued on a 7 days spray interval. Apply in a sufficient volume of water to ensure full coverage. Include a surfactant to improve coverage.



Fig. 1. Wilting and bleaching of younger leaves



Fig. 2. Progressing soft rot of onion bulbs



Fig. 3. Lengthwise brown discoloration of infected bulbs