

Postharvest Decay of Bell Pepper: *Bacterial Soft Rot*

Bell peppers are susceptible to a number of diseases while growing in the field, and some of these diseases can occur after harvest. The following information provides key steps that should be taken to avoid postharvest losses due to decay. This document focuses primarily on **bacterial soft rot**, the primary postharvest decay associated with pepper fruit.

Bacterial Soft Rot in the Field

Bacterial soft rot of pepper is caused by *Erwinia carotovora* subsp. *carotovora* and other closely related bacteria strains. Bacterial soft rot of pepper is characterized by black lesions on the stem or clear, water-soaked lesions on the sidewalls of the fruit. *Erwinia* spp. cause decay on a number of vegetable crops including tomato, melon, and sweet potato. Bacterial soft rot can occur in the field or in the postharvest environment. Excess nitrogen fertilization and irrigation have both been associated with increased susceptibility to bacterial soft rot, as excess fertility or water promotes more succulent tissues, making the fruit more susceptible to physical damage during harvest and handling. Soft rot causing bacteria are very prevalent in the preharvest environment and can be particularly troublesome in warm, moist weather. Soft rot bacteria require an injury to infect fruit, thus the harvesting process can lead to small surface abrasions that provide the bacteria with an opportunity to infect the fruit. Soft rot bacteria can also survive on harvest containers, providing another opportunity for infection of freshly harvested peppers.

Postharvest Practices

Actual fungal or bacterial infections that occur on peppers during harvest are not likely to be eradicated after harvest. In the packinghouse operation, equipment surfaces that come in contact with peppers should be cleaned and sanitized daily to ensure that potentially infectious bacteria and fungal inoculum brought in from the field cannot cause decay by cross contaminating additional lots. Dry brushing of peppers is common in some regions, and care should be taken to ensure that brush speeds are not excessive and that fruit is free from sand and dirt, as this will increase abrasion damage and can increase decay. Rinsing of peppers can improve lubrication on brush surfaces and rinse away soil and other potential field contaminants. It is critical that water used in postharvest applications be properly sanitized to prevent spread of decay inoculum through the brush bed and packline. Proper use of sanitizing chemicals approved for application directly to produce will reduce the spread of decay inoculum. Eliminating free water on the pepper after washing and prior to packing can reduce the potential for bacterial soft rot decay.

After packing, fruit should be placed into cold storage prior to transport, but peppers should not be held at temperatures below 45°F, as this increases the likelihood of chilling injury and *Alternaria* rot. Vacuum cooling removes excess moisture from the pepper surface and is the quickest method available for post-pack temperature reduction. Forced air cooling is also effective.



fig. 1 Tissue damage and water soaked lesion surrounding the stem resulting from bacterial soft rot infection

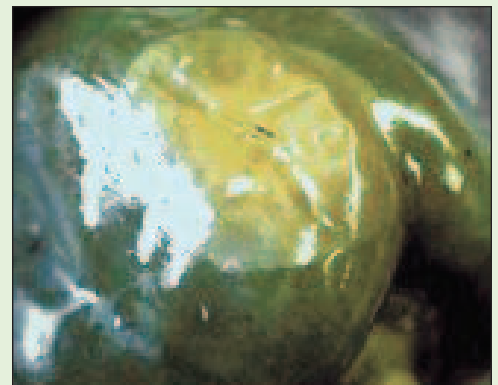


fig. 2 Water soaked soft rot lesion on the outer flesh of bell pepper

Key Focal Points to Reduce Bell Pepper Decay:

- Avoid excessive N fertilization and over-irrigation
- Do not pick while foliage is wet
- Sanitize picking containers to prevent cross contamination
- Clean and sanitize postharvest equipment to prevent cross contamination
- Use sanitizing chemicals approved for direct contact with vegetables to reduce decay inoculum
- Dry fruit prior to packing
- Promptly refrigerate packed fruit (do not store below 45°F)