

Controlling Bacterial Soft Rot Cross-Contamination of Tomatoes with Selectrocide®

Bacterial soft rot is a leading cause of decay in fresh market tomatoes. The disease is most commonly caused by a strain of *Erwinia* spp bacteria, a destructive plant pathogen that can be found anywhere that vegetables are grown. Bacterial soft rot will progress rapidly when fruit is not cooled, causing what look like water soaked blisters on the tomato as the bacteria destroys the tomato pulp underneath the peel. Under ideal conditions, the organism can grow so rapidly that bacteria-laden tomato juice may actually foam out of the stem end of the infected fruit (see photo below).



Photo: Foaming exudate from tomato infected with bacterial soft rot

Erwinia spp bacteria can multiply rapidly in summer conditions that are typical east of the Mississippi River. The high humidity enhances bacterial survival, and insects, harvest crews or afternoon thunderstorms can readily spread the bacteria in the field (Mahovic et al. 2004). The organism can cause postharvest decay if it infects wounds that occur during harvest, thus it is important to avoid picking fruit until the plants are dry. Wet conditions increase fruit turgidity, making fruit more susceptible to injury and subsequent infection from *Erwinia* spp and other decay-causing organisms.

Infections that occur during harvest will often not be apparent when the crop is packed. However, decay inoculum can be present on

the tomato surface and field debris, and can be liberated from any infected fruit during subsequent handling after harvest (Mahovic et al. 2004). To prevent possible cross-contamination of sound fruit with *Erwinia* spp bacteria, it is essential to use an effective biocide not only in the dump tank, but also during brush-washing. Proper washing with an EPA-registered antimicrobial, combined with an effective equipment cleaning and sanitation program, reduces the potential of a few spoiled fruit transferring decay to subsequent loads of product. Cross-contamination on the packing line can lead to significant decay at the market.

There is now a powerful and easy-to-use antimicrobial for direct application to produce that is highly effective in preventing *Erwinia* spp cross-contamination of tomatoes. Selectrocide high-purity chlorine dioxide is an EPA-registered biocide that reduces spoilage microorganisms on raw produce. The ideal application for Selectrocide is as a non-recovery spray over brushes during the washing process. Recently published research (Pao et al 2007) shows that even in dip treatments that did not have the added benefit of mechanical brushing, Selectrocide prevented cross-contamination of tomatoes by *Erwinia* spp and also significantly reduced the level of inoculated bacteria on the tomato surface itself. By killing spoilage organisms liberated from the tomato surface during washing, Selectrocide is able to prevent the transfer of those organisms to sound fruit, thereby preventing cross-contamination and the spread of decay.

Selectrocide's efficacy in helping prevent cross-contamination has also been observed in commercial tomato operations. For example, during a period of heavy decay pressure, one of Highland's tomato packing customers switched its brush wash process from an alternative chemistry to Selectrocide, and decay levels in quality control samples dropped by over 90%. In addition to the improvement in product quality after switching to Selectrocide, the customer also enjoyed the simplicity of using high-purity chlorine dioxide. They no longer had to battle pH buffering issues and the corrosivity of the product they were using prior to switching to Selectrocide. As now proven in several segments of the vegetable industry, Selectrocide provides a simple and highly effective way to improve arrivals and maintain product quality.

Contact Highland Fresh Technologies, 1-888-395-5000 to learn more about how Selectrocide can improve arrivals in your operation.

Literature Cited

- M. Mahovic, S. Sargent, and J. A. Bartz. 2004. Identifying and Controlling Postharvest Tomato Diseases in Florida. University of Florida IFAS Bulletin HS866.
- S. Pao, D. F. Kelsey, M. F. Khalid, and M. R. Ettinger. 2007. Using Aqueous Chlorine Dioxide to Prevent Contamination of Tomatoes with *Salmonella enterica* and *Erwinia carotovora* During Fruit Washing. *J Food Protect.* 70:629-634.

Figure 1: Decay Levels in Tomato QC Samples

