Tomato Postharvest Disease Alert - October 2006

By Phyllis Gilreath, Manatee County Extension; Jerry Bartz, UF/IFAS, Plant Pathology Dept.; Steven Sargent, UF/IFAS Horticultural Sciences Dept.

As many of you are aware, there have been serious problems in other parts of the SE this summer and fall with post harvest fruit rot problems on round tomatoes. Since we have begun harvesting in this area, now is the time to review with your packinghouse staff and your growers agricultural practices which can help minimize problems. Due to the seriousness of this problem, a task force has recently been formed by IFAS Administration and is headed by Dr. Jerry Bartz, UF/IFAS Postharvest Plant Pathologist. While this task force will address problems as they occur and coordinate research that is needed, any solutions will also require the cooperation of all the packinghouses. This is not a problem for one or two packinghouses……this is an industry-wide problem which affects the reputation and marketability of Florida tomatoes. While some of this information may be familiar to many of you, a review never hurts.

What are the major postharvest diseases?

**Bacterial soft rot** is a common and aggressive disease caused by *Erwinia carotovora*. These bacteria are everywhere. They grow on the surfaces of plants and cause a soft rot, particularly during wet weather. They can be spread by rainstorms, insect feeding, harvest crews, picking containers and packinghouse equipment. While they cannot penetrate the waxy tomato skin, small wounds and even abrasion from sand enable infection. Suckering, rough handling, sunscald, and tying plants are other means by which soft rot bacteria enter tissue. Soft rot bacteria readily disperse in solution and they are quickly moved in water and even from one ‘disease soaked’ carton to the dry one next to it. High humidity (90-95%) promotes survival and infection potential. Free water on wounds or stem scars promotes infection. High fruit temperatures (86-95°F) are associated with rapid decay development and the period between inoculation and visible soft rot symptoms may be as little as 12 hours. Secondary spread in boxes can easily occur by 48 to 72 hours after packing if a few fruit were inoculated during harvest. Affected fruit have a very putrid odor as compared to the pungent, pickled odor of those infected with sour rot.
Sour rot is caused by a fungus, *Geotrichum candidum*, which is actually a type of yeast. Sour rot lesions have a sour or pungent odor, do not rapidly engulf the entire fruit, but rather lead to a liquefying of the gel in affected locules. Older lesions are usually covered by whitish mycelial growth. Sour rot lesions can occur within 24 hours after inoculation but they don’t develop very rapidly. The fruit may remain recognizable for days, not becoming ‘watery sacks’ as with soft rot. The fruit surface over the lesions often peels back. Juices from the young lesions are clear (meaning very few yeast cells) thus, spread among fruit within boxes does not occur readily. Some packers have noticed clear liquid in the bottom of a carton, with only one rotted fruit, and even the fruit sitting in the liquid were not affected. This was likely sour rot. Eventually, spores are produced and secondary spread will occur. The spread of decay is correlated with fruit temperature, with optimum growth at 86°F.
Figure 3. Sour rot in pink tomato from West Central Florida - note that the lesion is confined to the locule; it has not progressed through fruit but is being limited by locular wall.

What can be done in the field to prevent or lessen problems?

The first step in reducing the potential for contamination is to wait until plants and fruit are completely dry before harvesting. Periods of persistent rainfall or chilling temperatures can increase decay losses despite good practices. Even though plants may appear dry, check the plant interior. If soft rot is observed in the field, the crew may get the inoculum all over the fruit and there will be post harvest losses because chlorinated water cannot clean the bacteria out of inoculated wounds. Even without dew or fog, under high soil moisture conditions, guttation can occur. Droplets of water appear at the edge of the leaf, which may also increase the chance for spread of soft rot pathogens.

In addition to harvesting truly dry plants, instruct crews to avoid grabbing obviously decayed or partially decayed fruit. One other strategy may be to schedule harvests around copper/mancozeb sprays for bacterial spot control--harvest as soon as the label allows. Research in the mid-80s on preharvest sprays showed some evidence that there was a reduction in the potential for postharvest decay when fruit were picked as soon as possible after a copper-mancozeb spray. It should reduce bacteria and maybe Geotrichum on the plant and may provide a residue on the fruit that would help reduce inoculation of wounds. Whether it will result in a biologically significant reduction will require further research. Until then, there are no guarantees--------this is just a suggestion to try.

Be very conscious about worm control. For every fruit that is a ‘sack’ or has a noticeable lesion, there are likely several others where the decay is behind the fruit or has just started, particularly if there’s worm damage. Make sure baskets, field boxes, etc. are clean and have been sanitized. Avoid throwing fruit from buckets into bins to reduce mechanical injury or bruising. Wounds from fingernails are often found in fruit that is succumbing to rot. Anything that can be done in the field or packinghouse to reduce damage to fruit should help.

As the task force begins addressing this problem, we ask the help of the industry by notifying us immediately when problems are seen in the field or packinghouse so that we can begin working on it. We’d like to know about your observations of crops in the morning. For example, if you are checking your fields periodically, at what approximate time do the last traces of dew disappear? If the dew is gone, do you still see a few water droplets on the leaf edges in the canopy? Most growers already keep good records of rainfall and pesticide applications, but any weather information we can get would be invaluable--------noting things like fog, wind, heavy dew periods, cold fronts, etc. On fruit that have problems, we will need to know the sequence and timing of events from the field through the packing
process. Any and all information will be helpful. (Phyllis Gilreath, Manatee County Extension; Jerry Bartz, UF/IFAS, Plant Pathology Dept.; Steve Sargent, UF/IFAS Horticultural Sciences Dept.)

Additional information on packinghouse sanitation and management can be found in the following IFAS publications:
Identifying and Controlling Postharvest Tomato Diseases in Florida  http://edis.ifas.ufl.edu/HS131
Chlorine Use in Produce Packing Lines  http://edis.ifas.ufl.edu/ch160
General Overview of the Causative Agents of Foodborne Illness  http://edis.ifas.ufl.edu/fs099