

## Disinfecting Tomato Stakes

Many of you have not had an outbreak of Bacterial Canker, Speck or Spot on your farms and hopefully you never will. Those of you that have been battling these bacterial pathogens know how devastating they can be if the right conditions persist during the growing season. It is difficult to tell prior to setting out your plants if you might have a problem. You could have one tomato that is infected out of a thousand in the greenhouse which can spread the bacteria very quickly. Sanitation is one of our best management practices that we can do. If you are reusing the plastic tray inserts and bottoms, they also need to be sanitized before seeding or repotting tomato plants into them. So often I have seen inserts and bottoms not cleaned prior to reusing them for tomatoes and have seen problems with bacterial pathogens.

Sanitation of the greenhouse is also important, not only from a bacterial infection, but many of the other diseases that can affect our small seedlings including damping off diseases. If you have had to purchase plants from other growers in the past because you either didn't have enough plants or you lost them to frost or something it is very important that you sanitize the greenhouse where your tomatoes are going to be. I have seen contaminated transplants brought in from outside sources that have caused a lot of problems. For both trays and greenhouse benches, Clorox or other household chlorine bleach (5.25% sodium hypochlorite) can be used. Green-Shield (quaternary ammonium chloride salt) or ZeroTol (hydrogen peroxide) can be used. Green-Shield is recommended at 1 tablespoon per gallon of water. The other interesting fact about Green-Shield is that 1 gallon of Green-Shield is equal to 28 gallons of Clorox. Please refer to the label for recommended rates.

For Clorox, a typical drench solution is 0.5% or 1 part bleach to 9 parts water. **However, the key to any of these products working most efficiently is to make sure that you get rid of any plant or soil debris on the benches, inserts or bottoms!** Organic matter binds very tightly to the bleach molecules and renders them useless. Therefore, it is important to sweep or rinse benches, flats etc. with clean water prior to sanitizing.

The same holds true for our tomato stakes to. It is important to remove as much of the organic matter possible before we sanitize them. There are lots of ways to do this but I think the most effective is to use a power washer or a hose and scrub brush. Yes, it is time consuming, but well worth it oth-

erwise the rest of the sanitation could be worthless! See the rest of the article below for more directions on disinfecting tomato stakes from Cornell Vegetable Pathologist Meg McGrath.- *CB*

**Disinfecting Used Tomato Stakes:** Wooden stakes are a place where the bacterial pathogens that plague tomatoes can survive between crops. In fact, stakes from a tomato planting where research was conducted on bacterial diseases have been used as a source of the pathogen for subsequent experiments! Therefore, it is prudent for growers to disinfect stakes that were in a field where a bacterial disease occurred last year. This step is worthwhile even if there is uncertainty about occurrence considering how difficult bacterial diseases are to manage. There are three bacterial diseases of concern on tomato: speck, spot and canker. Bacterial canker is sufficiently destructive that discarding stakes is recommended after an outbreak. Before the field season is in full swing often presents an opportunity to find time for disinfecting stakes.

Step one in disinfecting anything is removing as much dirt and debris as possible because this can protect pathogens and de-activate disinfectant. Therefore start by hosing down used tomato stakes.

Clorox or other household chlorine bleach (5.25% sodium hypochlorite) is commonly used as an agricultural disinfectant, but it is not the best choice. Use bleach at a rate of 0.5% (= 1 part bleach + 9 parts water). And use in a well ventilated area. **Soak stakes for 30 minutes.**

While bleach is highly effective, it is short-lived after mixing in water, with a half-life of only 2 hours, and it is especially prone to being inactivated by organic matter, thus pre-cleaning is critical. A disinfectant containing quaternary ammonium chloride salts like Green-Shield is more stable than bleach after diluting with water. Use at 1 Tablespoon (= 0.5 fl oz) of Green-Shield in 1 gallon water. While this disinfecting solution will be more stable than bleach, it should not be used more than 24 hours after preparation. **The other key is that you still need to soak stakes for at least 10 minutes.**