

Response of *Alternaria* spp. blight and *Septoria* spp. leaf spot to biological disease control agents in tomatoes

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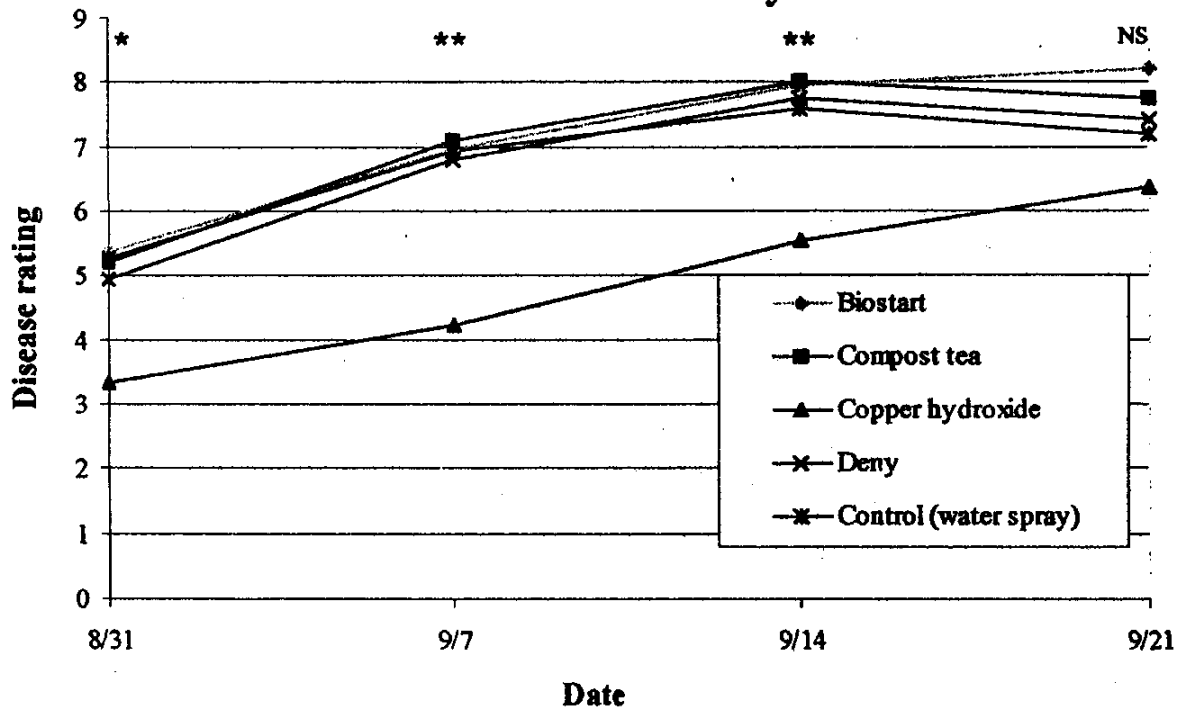
Abstract: The primary disease control material available to organic tomato growers at this time is copper hydroxide. However, long-term use of copper hydroxide is undesirable because of soil build-up of copper and resulting phytotoxicity. There are several promising new biological controls, but these materials are new enough that is hard for growers to evaluate them. This project compared copper hydroxide and a control treatment of water to 2 different commercial microbial products (Biostart™ Agricola, a mixture of *Bacillus cereus*, *B. laterosporus*, and *B. mycoides*, and Deny®, or *Burkholderia cepacia*), and to an aerobically incubated compost tea. The copper hydroxide treatment showed significantly lower levels of disease than any of the other treatments, which did not significantly differ from one another. There were no significant differences in yield of first- or second-quality tomatoes among any of the treatments.

Methods: Tomatoes (variety 'Moskvich') were planted on June 1, 2000 in a randomized complete block design. Four replications of five treatments were used. The treatments were as follows: Biostart™ Agricola, at 2 Tbsp. per liter of water, Deny®, at ½ oz. per liter, copper hydroxide at ½ tbsp. per liter, compost tea prepared according to directions using a Soil Soup Bio-Blender, nutrient solution and worm compost supplied with the unit, and water. Each plot consisted of five plants, with an 18-inch spacing between plants and five feet between rows. Tomato varieties of contrasting fruit colors were planted between plots to help delineate plots without affecting plant density. Treatments were applied weekly with a backpack sprayer. Tomatoes were harvested weekly after they started bearing, and both yield and second-quality yield were recorded. Visual foliar disease ratings were conducted weekly on an individual-plant basis starting August 31, 2000. Ratings were made on a 0-10 scale with 0 being no disease and 10 being a dead plant.

Results and Discussion: The copper hydroxide treatment resulted in the lowest disease ratings. No difference was detected between the control treatment and any of the biological agents. In spite of lower foliar disease levels in the copper treatment, no differences in yield were detected between the treatments. This was an extremely wet year, and the experimental site was poorly drained, remaining waterlogged the entire season, and resulting in plants which appeared quite stunted and unhealthy. Yields were considerably lower than other tomato plantings in better drainage zones nearby. These data must be interpreted with caution in light of this fact. It is possible that there might have been more separation among treatments if conditions had been more conducive to plant growth. However, this trial certainly doesn't identify any advantage to using the selected materials as alternatives to copper for disease control in tomatoes.

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Tomato disease ratings over time under five different disease control systems



Yield of first- and second-quality tomatoes under five different disease control systems

