Reducing Water Requirements in the Greenhouse Production of Solanum lycopersicum with Soil Amendments

Wanjura, Benjamin (School: Christ the King Cathedral School)

Tomatoes, Solanum lycopersicum, are a staple food around the world. Their unique flavor and availability make them popular. In the United States, tomato plants are commonly established in greenhouses and sold to garden stores or directly to consumers for planting. This project determined which combination of soil amendments and irrigation rates would be the best in establishing sellable tomato plants. Potting soil, potting soil and sand combination, potting soil with a polymer coated sand amendment, and potting soil with a hygroscopic additive were tested. Four irrigation frequencies were evaluated with each soil amendment treatment. Plants received 250ml of water per watering The irrigation frequencies were daily, every two days, every three days, and once a week. The data gathered were stomatal gas exchange measure with a leaf porometer, dry and wet weights, TDR measurements for soil water content, KD2 measurements for recording soilthermal properties, plant height, plant growth index, and harvest dry weight. The hypothesis was that tomato plants with the hygroscopic soil amendment in the second and third irrigation zones would be healthier than the tomato plants in the unamended potting soil in the highest irrigation zone. The hypothesis was partially supported with aboveground biomass and water retention characteristics maintained with the hygroscopic amendment irrigated every three days.This project was chosen because water conservation is imperative for the economic viability of greenhouses around the country. More efficiently establishing tomato plants in these greenhouses is a first step in conservation and economic gain for greenhouse producers.

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