

## ABSTRACT

### EFFECTS OF APPLICATION TIMING AND WATER CHEMISTRY ON PHOSPHATE UPTAKE EFFICIENCY FOR TOMATOES GROWN ON TULARE CLAY SOIL

During the 2004 growing season, observations with phosphate (P) uptake were made on growing processing tomatoes grown on Tulare clay soils. Upon further investigation low P levels were observed by sap tissue sampling. Soil samples taken in the same locations indicated high levels of free lime. This study explored the use of drip irrigation to deliver water of pH 6 and pH 7 modified by sulfuric acid to aid in reducing the root-zone soil pH and calcium carbonate levels enhancing P uptake. Two applications of P were applied, one pre-plant (grower standard) and a post-plant irrigation run of phosphoric acid. Results from the trial showed post application of phosphoric acid increased P concentration levels as measured by petiole sap analysis. No significant differences occurred in tomato yields and solids as measured Brix readings. This study demonstrated that it was possible to modify applied irrigation water and increase seasonal P levels. The final results of this trial were strongly influenced by the high free lime soils, limiting the ability to adjust the soil pH.

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