

Effects of conocarpus biochar and organic farming residues on yield and quality of tomato under drip irrigation

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ABSTRACT

The objective of this study was to investigate the effects of conocarpus wastes biochar produced at $400 \pm C^\circ$ or organic farm residues at varying application rates (0, 4 and 8% w/w) on yield and quality of tomato grown in sandy soil under drip irrigation with non-saline and saline water. In addition, the status of available macro- (PK) and micronutrients (Fe, Mn, Zn and Cu) were also investigated. The results showed generally that non-saline water produced significantly higher plant height, plant fresh weight, plant dry weight and total yield under biochar and organic farming residues. However, irrigation with saline water showed significantly higher values of chemical compounds including acidity, vitamin C and total soluble salts in tomato fruits. Our results demonstrated that applying biochar or organic farming residues to sandy soil under drip irrigation of saline and non-saline water has significant impacts on yield and quality of tomato. The highest enhancement impacts on tomato yield occurred with application biochar. This can be explained by the improvement of soil and plant nutrients availability responsible for the increased yield and quality of tomato in the biochar treatments. In this context, there have been significant increases in soil organic matter and soil available K

and Mn following the addition of biochar. Therefore, applying biochar under arid conditions could be a promising amendment for increasing vegetable crop productivity.

Keywords: Drip irrigation, Biochar, Organic-farming residues, Tomato, nutrients status.