Effects of container size and fruit load intensity on tomato under salt stress

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Introduction

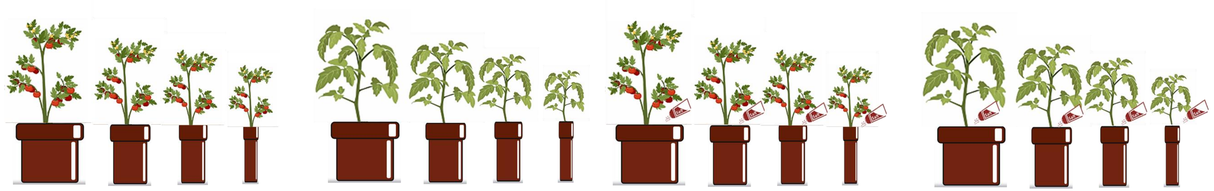
Container size and fruit load intensity are two common factors manipulated to regulate plant growth and development. As saline water is increasingly used for irrigation in arid and semi-arid regions, it is important to study effects of container size and fruit load intensity on tomato in both aboveground and belowground parts under salt stress.

Objective

Identify the correlation between above- and belowground growth patterns of tomato plants grown with different container sizes and fruit load intensities under salt stress.

Methodology

Containers of four sizes (8-, 28-, 48-, and 200L), two salinity levels (1.5- and 7.5 dS m^{-1}) and two crop load intensities (0% and 100%) were applied. Gas exchange parameters, plant growth parameters, and root development were monitored periodically. Plant biomass and various root traits were measured at harvest.



Results

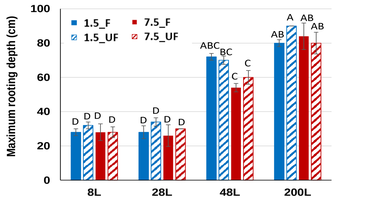


Fig. 1 Influence of different treatments on rooting depth.

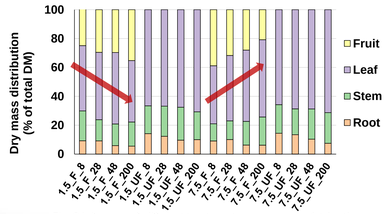


Fig. 2 Influence of different treatments on dry mass distribution (% of total DM) of tomato organs.

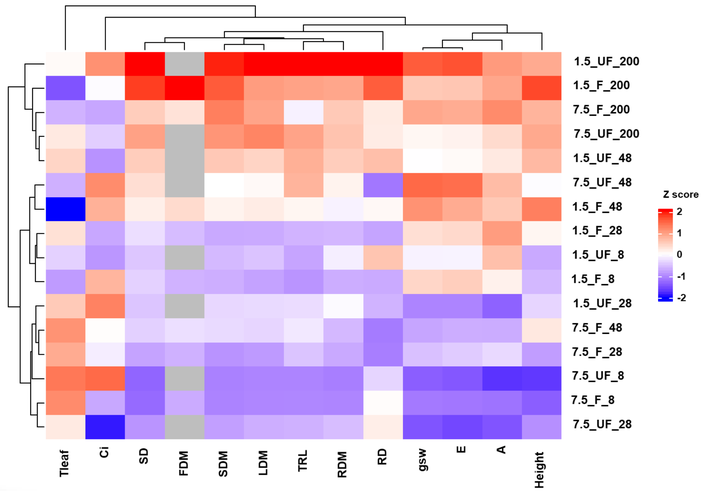


Fig. 3 Heatmap and hierarchical clustering for morphological and physiological parameters under different treatments

Conclusion

It is concluded that container size has a pronounced effect on physiological behaviours of tomato plants. Therefore, properly increasing container size can alleviate yield reduction under saline irrigation.

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