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A Small-Scale Flexible Test Bench for the Investigation of Fertigation Strategies in Soilless Culture

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Abstract : In soilless culture, the management of the nutrient solution is the most important aspect for crop growing. Fertigation dose, frequency and nutrient concentration must be planned with the objective of reaching an optimal crop growth by limiting the utilized resources and the associated costs. The definition of efficient fertigation strategies is a complex problem since fertigation requirements vary on the basis of different factors, and crops are sensitive to small variations on fertigation parameters. To the best of author knowledge, a small-scale test bench that is flexible for both nutrient solution preparation and precise irrigation is currently missing, limiting the investigations in standard practices for soilless culture. Starting from the analysis of the state of the art, this paper proposes a small-scale system that is potentially able to concurrently test different fertigation strategies. The system will be designed and implemented throughout a three year project started on August 2018. However, due to the importance of the topic within current challenges as food security and climate change, this work is spread considering that may inspire other universities and organizations.

Keywords : soilless culture, fertigation, test bench, small-scale, automation
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