Electricity consumption rosso

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One of the largest surveys in Europe about energy consumption in Italian wastewater treatment plants (WWTPs) is presented, based on 241 WWTPs and a total population equivalent (PE) of more than...

Electrical energy used for water supply and wastewater treatment worldwide represents more than 2% of the world"s electrical energy consumption (Plappally & Lienhard 2012). In conventional WWTPs, electricity consumption may account for over 25% of operation expenditures (OPEX), depending on plant size, configuration and local conditions (Li et ...

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Growing lettuce varieties under different LED light spectra (A) red/blue, 3:1; R: B, with a peak 656 nm, (B) blue, with a peak at 450 nm, (C) red, with a peak at 656 nm, (D) white, with a peak at 449 nm, in the floating hydroponic system. The photosynthetic photon flux density (PPFD) was 215 ? 5 mmol m-2 s-1. The photoperiod of 16/8 h (day/night) was maintained.

Growing lettuce varieties under different LED light spectra (A) red/blue, 3:1; R: B, with a peak 656 nm, (B) blue, with a peak at 450 nm, (C) red, with a peak at 656 nm, (D) white, with a peak at 449 nm, in the NFT hydroponic system. The photosynthetic photon flux density (PPFD) was 215 ? 5 mmol m-2 s-1. The photoperiod of 16/8 h (day/night) was maintained.

To allow uniform flow of nutrient solution, gully inclination was 1%. The flow rate on the outlet of the NFT system was 2.4 L min-1.After transferring the plants to the NFT systems, the lettuce seedlings were fed with nutrient solutions similar to those described for the first experiment. The EC and pH were monitored daily during the cultivation process using portable pH meter (Fisherbrand(TM) accumet(TM) AP115 Portable pH Meter Kit) and portable EC meter (HI9033 EC Meter, Setare Arsh Aria company).

At the end of the experiment (42 days after transplanting), the plants were harvested, and shoot fresh mass (SFM) was measured with a digital scale with an accuracy of 0.001 g. According to the number of plants per unit area and the total weight of plants in each treatment, weight yield (head weight) per unit area was determined and finally, the yield index was calculated based on plant weight per square meter.

The dry weights of shoots were recorded, and the shoots were ground using a stainless-steel grinder. The total concentrations of N, P, K, Ca, Mg, S, Fe, Mn, Zn, Mo, B, Na and Cl in plants shoots were determined according to standard methods following H2SO4 digestion (Estefan et al., 2013).

where U (mmol week-1) is the total uptake by N plants during the time interval of one week. At and At-1 (mmol) are the nutrient contents of a plant at the end and the start of the week, respectively. The loss from nutrient solution is defined as:

where L (mmol week-1) is the loss of nutrients from the solution, Ct and Ct - 1 (mmol L-1) are the nutrient concentrations at the end and start of a week, respectively and D (mmol) is the total amount of nutrient added to the supply tank, V (L) is the constant volume of the supply tank, and S (mmol week-1) represents the removal of nutrient due to frequent sampling of the nutrient solution.

The experiment was designed as a 2x3x4 factorial and arranged in a completely randomized design with three replications. Also, SAS software version 9.4 (SA Institute, Cary, NC, USA) was used to analyze the data. A two-way analysis of variance (ANOVA) was used for statistical analysis of data. In addition, Duncan"s multiple range test was used at the 5% probability level when the analysis of variance showed significant treatment effects.

The authors confirm that all the experimental research and greenhouse studies on lettuce plants, including the collection of plant material, complied with relevant institutional, national, and international guidelines and legislation.

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