

Greywater Reuse for Sunflower Irrigation Previously Radiated with Helium-Neon Laser: Evaluation of Growth, Flowering, and Chemical Constituents

Authors : Sami Ali Metwally, Bedour Helmy Abou-Leila, Hussien Ibrahim Abdel-Shafy

Abstract : This study was carried out at the pilot plant area in the National Research Centre during the two successive seasons, 2020 and 2022. The aim is to investigate the response of vegetative growth and chemical constituents of sunflowers plants irrigated by two types of wastewater, namely: black wastewater W1 (Bathroom) and grey wastewater W1, under irradiation conditions of helium-neon (He-Ne) laser. The examined data indicated that irrigation of W1 significantly increased the growth and flowering parameters (plant height, leaves number, leaves area, leaves fresh and dry weight, flower diameter, flower stem length, flower stem thickness, number of days to flower, and total chlorophyll). Treated sunflower plants with 0 to 10 min. recorded an increase in the fresh weight and dry weight of leaves. However, the superiority of increasing vase life and delaying flowers were recorded by prolonging exposure time by up to 10 min. Regarding the effect of interaction treatments, the data indicated that the highest values on almost growth parameters were obtained from plants treated with W1+0 laser followed by W2+10 min. laser, compared with all interaction treatments. As for flowering parameters, the interactions between W2+2 min. time exposure, W1+0 time, w1+10 min., and w1+2 min. exposures recorded the highest values on flower diameter, flower stem length, flower stem thickness, vase life, and delaying flowering.

Keywords : greywater, sunflower plant, water reuse, vegetative growth, laser radiation

Conference Title : ICACCIA 2023 : International Conference on Agriculture, Climate Change Impacts and Adaptation

Conference Location : Barcelona, Spain

Conference Dates : August 10-11, 2023