

EXAMINATION OF THE IMPACTS OF SEWAGE SLUDGE TREATMENT ON THE PHYSIOLOGICAL CHARACTERISTICS OF SPINACH

Dávid Kaczur¹, Brigitta Tóth²

¹ Institute of Food Science, Faculty of Agricultural and Food Sciences and Environmental Management, University of Debrecen

² Institute of Food Science, Faculty of Agricultural and Food Sciences and Environmental Management, University of Debrecen

The examination of sewage sludge as a sustainable fertilizer is one of the most common studies nowadays. The increase in human population demands more and more nutrient supply during fertilization. This study aimed to examine the impacts of sewage sludge treatment on relative chlorophyll content (SPAD-Unit), the concentration of photosynthetic pigments (chlorophyll-a, chlorophyll-b, and carotenoids), dry weight, and element concentrations in the shoots and roots of spinach 30 days after treatment. *Spinacia oleracea* plants were grown in a climate chamber. The control plants were grown using modified Hoagland's nutrient solution, the sewage sludge treated plants were grown utilizing distilled water containing 4g/L sewage sludge. The relative chlorophyll content did not change significantly in the second leaf but was significantly higher in the third and fourth leaves in the sewage sludge treated plants compared to the control. On the other hand, no significant differences were measured in the concentration of photosynthetic pigments between the treatments. Additionally, the dry weight of shoots and roots also was not significantly different. The concentration of calcium, chrome, iron, potassium, magnesium, and sulfur was lower in the sewage sludge treated plants relative to the control. While, the concentrations of aluminum, copper, iron, sodium, and manganese were 26, 1.5, 1.5, 2, and 7 times higher in the sewage sludge treated plants compared to the control. The concentrations of magnesium, phosphorous, sulfur, and potassium were also higher. These results suggest that the examined sewage sludge would be a potential alternative nutrient source in crop production.