

SHORT-TERM EFFECT OF DISPERSION OF RESIDUAL SLUDGE ON THE SOIL *EUCALYPTUS CAMALDULENSIS* DEHNH, TIARET (ALGERIA)

Leila Soudani¹, Benchohra Maamar², Mohamed Azzaoui³, Mhamed Maatoug¹, Hermann Heilmeyer⁴ and Oliver Wiche⁴

¹Ibn Khaldun University, Tiaret, Algeria

²El wancharissi University Center, Tissemsilt, Algeria

³Ecole Supérieure d'Agronomie (ESA), Mostaganem, Algeria

⁴TU Bergakademie Freiberg, Freiberg, Germany

soudani_leila@outlook.fr

Silvicultural upgrading of sewage sludge is an alternative to current solutions. It presents a lower risk of contamination of the human food chain than its use in agriculture. In this context, the use of forest plantations can offer many advantages.

Therefore, the aim of this work was to study the characteristics and to exploit the residual sludge of the Tiaret wastewater treatment plant using forest plantations.

Wastewater treatment produces a large amount of sludge. The different uses of disposal such landfills or incineration and agricultural use, have negative consequences for the environment. A valorization using forest plantations may appear in some situations as an alternative to current solutions, it optimizes the degradation and recycling of organic and mineral elements. The fertilization of forest plants by wastewater treatment plant's sludge, presents a lower risk of contamination of the human food chain than its use in agriculture. In this context, the use of forest plantations can offer many advantages. The objective of this study is to evaluate the fertilizing characteristics of the sludge from the Tiaret wastewater treatment plant and to improve the quality of the soil studied. Henceforth, the sludge used contains only a small proportion of metallic trace elements that are far below the AFNOR standards, and therefore it does not present any risk of toxicity.

One-year-old *Eucalyptus camaldulensis* were transplanted into pots with mixtures of sludge and soil, where the sludge content was 20%, 40% and 60%. The physico-chemical measurements of the substrates and the biometric measurements of the plants (height, base diameter, diameter mid-height and number of leaves) were carried out within six months of planting.

The results demonstrated the positive effect of sludge application on soil parameters studied. We also found a significant difference in the increase of height and the number of leaves in plants treated with sludge. Biometric values for all plants in sludge mixtures were higher than those for control plants (100% soil). The 60% sludge substrate yielded the best results, with the exception of the stem diameter, with an average and a standard deviation of: height 49.4 ± 24.1 cm, number of leaves 68.8 ± 6.2 while the mean height for control plants was 34.3 ± 12.8 cm and the mean number of leaves was 40 ± 3.8 . The addition of sludge provides soil modification and supplementary feeding for forest planting.

These experimental data have shown that sewage sludge can be used as fertilizers. But it is necessary to continue investigations in the long term that will establish technical references and guides validated by field experiments.

Key words: Fertilization, Biometric Measurements, Plant Growth, *Eucalyptus camaldulensis*, Tiaret