Título: INFLUENCIA DE LA APLICACIÓN DE LODOS DE DEPURADORA SOBRE LA FISIOLOGÍA Y LA NODULACIÓN DE PLANTAS DE ALFALFA (MEDICAGO SARIVA L.) SOMETIDAS A ESTRÉS HÍDRICO

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Descriptores:

> ELIMINACION DE RESIDUOS

El fichero de tesis no ha sido incorporado al sistema.

Resumen: Summary

Influence of sewage sludge application on the physiology and nodulation of alfalfa (Medicago sativa L.) plants under drought conditions

Key words: Aerobic thermophile autothermic digestion (ATAD), drought, heavy metals, nitrogenase activity, oxidative stress, sewage sludge.

The recycling of sewage sludge to agricultural land is a useful and beneficial practice due to potentially beneficial effects on soil fertility. These residues have high organic matter content and nutrients that are required for plant growth. Nevertheless, the uncontrolled addition of sludge to the soil can produce problems often associated with the presence of elevated amounts of heavy metals in the sludge. After successive sludge applications these compounds can accumulate to toxic levels affecting plants and soil microorganisms. Legumes are a group of plants able to associate symbiotically with nitrogen-fixing bacteria, so that no nitrogen mineral addition is required. Since Rhizobium- legume symbiosis is very sensitive to modifications on soil conditions, it seems necessary to evaluate the impact of the application of sewage sludge on the plant and nodule physiology.

Alfalfa plants were grown under controlled conditions (greenhouse), and were inoculated with Sinorhizobium

meliloti strain 102F34. Plants were grown in pots with a mixture of perlite: vermiculite (2:1, v/v). Three types of sludges were incorporated to substrate at different rates, from 1% to 20% (w/w). The sludges were obtained by different technologies: 1) anaerobic mesophile digestion (AM); 2) anaerobic thermophilic digestion (AT); and 3) aerobic thermophile autothermic digestion (ATAD). Pots without sludge but with inoculated plants were used as control treatment for comparison. To analyze the effect of drought, pots were subjected to drought by withholding irrigation in a cyclic way (approximately 20 days) Results show that the processing treatment for sewage sludge digestion originates diverse effects on plant growth and nodule establishment of alfalfa-Sinorhizobium symbiosis. In our experimental conditions alfalfa performed better in AM than in ATAD sludge and this differential response appears to be mediated by plant ability for maintenance of a more equilibrated antioxidant status. Our data also suggests that it was necessary to evaluate carefully the quality and nutritional characteristics of the sludge obtained before its application to agricultural land.

Revisado el impreso C y el resumen en inglés correspondiente a esta tesis, que encuentro conforme

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