

Technological alternatives for the treatment of livestock wastewater in order to ensure the quality conditions required for the irrigation of agricultural crops

Abstract

Treated wastewater is characterized by its content of physico-chemical and microbiological contaminants and its reuse in irrigation purposes depends on the compatibility between water quality and specific requirements for different soil types/crops. This paper refers to the possibility of applying some chemical treatment processes to wastewater resulting from livestock facilities in order to develop unconventional technological schemes for wastewater treatment. This is in good agreement with the principles of sustainable development regarding the minimisation of raw materials demands by means of reusing the useful components of metallurgical wastes in the form of recovered aluminium sulphate used as coagulation agents in wastewater treatment. Another option for the removal of specific pollutants is the treatment with electrochemically generated ionic aluminium species which is advantageous as regards avoiding the introduction of additional salts in the treated effluent, as the increase of soil salinity has become a more and more common issue in the irrigation practices using reclaimed wastewater. The results have highlighted similar coagulation performances, providing a superior removal efficiency for organic substances (up to 80% BOD) and suspended matter (over 80% TDS) and the partial removal of total coliform bacteria and colour. In the current context of the need to identify new water resources for crop irrigation in areas affected by drought, the diversification of technological solutions for wastewater treatment adapted to their specific conditions is a prerequisite and the solutions proposed accordingly may represent a successful alternative.