Deinking sludge is a solid waste generated at paper recycling plants where waste paper is deinked. Disposal of deinking sludge is the most serious environmental concern of the deinking process and methods of reusing sludge are being sought. One possibility is the application of sludge to sandy farm soils and waste disposal sites as a soil conditioner. In general, the deinking industry is not reusing sludge in this manner because of the three following concerns: That sludge does not improve plant growth, that sludge immobilises soil nitrogen causing plant nitrogen deficiency and that sludge causes heavy metal contamination of soils and plants.

Research was conducted to address these three concerns and thereby ascertain whether deinking sludge can be applied to land. A sludge was analysed to determine its carbon to nitrogen ratio, pH, ash content and Ca, Al, Fe and Mn concentrations. The levels of Cd, Cr, Cu, Ni, Pb and Zn and their availability, were also measured. This was followed by three plant growth experiments in pots. The first, on grey sand, was used to determine whether sludge improves plant growth, immobilises nitrogen and requires inoculation with microorganisms for satisfactory decomposition. Sludge was applied to red sand from a bauxite residue area for the second experiment. It also tested whether deinking sludge improves plant growth and/or immobilises nitrogen and compared sludge with poultry manure as an amendment. Grey sand was used once again for the third experiment, which investigated Cu contamination of plants after sludge application.

It was found that the deinking sludge had a high carbon to nitrogen ratio of 94, an alkaline pH and high Al, Ca and ash contents.

The sludge did not require inoculation with top soil microorganisms for decomposition. At an application rate of 200 t./ha., on grey sand, sludge depressed plant growth by immobilising soil N. On red sand, sludge applied at an application rate of 50 t./ha. improved plant growth, but not at 200 and 400 t./ha.. However, poultry manure was a superior amendment to deinking sludge.

The heavy metals present at significant concentrations were Cu at 440 mg kg\(^{-1}\) and Zn at 260 mg kg\(^{-1}\). Twenty four and 30\% of the total quantity of these heavy metals respectively were available to plants. The sludge caused an increase in Cu concentration in \textit{Triticale} plants growing in amended sands.