

# Fertiliser value of human manure from pilot urine-diversion toilets

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## Abstract

Ecological sanitation is a system that, unlike the traditional waterborne sewerage and pit toilet systems, regards human excreta as a resource to be recycled rather than as a waste. There is, however, little or no information on the fertiliser value of human excreta in South Africa. This study, therefore, evaluated the effectiveness of human manure as a source of nutrients using cabbage as a test crop at Ntselamanzi location, Alice, South Africa as part of a project intended to generate knowledge and good practice in ecological sanitation. Treatments were arranged in a randomised complete block design with 4 replications and consisted of a control, 100 kg N·ha<sup>-1</sup> as goat manure, and 4 non-zero rates of human manure and NPK fertiliser applied to supply the equivalent of 50, 100, 200, and 400 kg N·ha<sup>-1</sup>.

Human manure resulted in higher cabbage yields than goat manure but was out-yielded by inorganic fertiliser. The greater effectiveness of human manure when compared with goat manure was attributed to the fact that it was a better source of K and P for plants as it maintained higher levels of these nutrients in soil than goat manure. For greater agronomic effectiveness, the human manure should be co-applied with some inorganic N fertiliser as it proved to be a poor source of nitrogen. The human manure increased soil pH and therefore has potential for improving crop growth in acidic soils through its liming effects as well. The dry human manure was evaluated as comparable to Type B sludge in South Africa with respect to microbial content and could therefore be used to fertilise some crops/plants provided stipulated restrictions to minimise human exposure are adhered to.

**Keywords:** ecological sanitation, urine-diversion toilets, human manure, Type B sludge, goat manure, cabbage, recycling nutrients, South Africa