

Abstract: Third International Conference on Ecological Sanitation

Title	Microbiological safety of crops irrigated with greywater.
Keywords	
Author(s)	L. Salukazana*, N. Rodda*, M. Smith*, T. Gounden**, S. Jackson**, N. Macleod** and C. Buckley*
Address	* University of KwaZulu-Natal, DURban, 4041 ** eThekweni Municipality, 9 Prior Road, Durban 4001
Telephone	031 260-3015/3192
Fax	031 260-2029
Mobile	072 1265691
E-mail	roddan@ukzn.ac.za
Abstract ID no	L/4

Microbiological safety of crops irrigated with greywater

Wastewater disposal in situations where sanitation is provided by on-site dry sanitation presents a problem. In these cases, wastewater arising from activities such as bathing, washing clothes and washing dishes (greywater) is commonly disposed of to the ground in the vicinity of the dwelling. This contributes to contaminated surface run-off, hence to environmental degradation and health hazards. Greywater has been identified as a widespread pollution problem in all categories of dense informal settlements in South Africa, exacerbated by poor or absent solid waste management. One way to improve food security and contribute to environmental improvement in poor communities served with dry sanitation, is to re-use greywater for irrigation of food crops.

Two potential problems detract from this. Since greywater is a domestic wastewater, it contains both chemical and microbiological contaminants. Chemical constituents, particularly surfactants, may cause phytotoxicity to crops. Microbiological contaminants pose a risk of disease transmission in the community via contamination of either plants or soil. Both these factors must be assessed when evaluating the safety of greywater re-use.

Greywater re-use is being investigated by eThekweni Municipality as a water management option. A pilot number of families with access to plots of arable land were provided with a greywater collection tank and with seedlings of plants producing crops above ground. The trial was run for one year and the quality of crops was assessed. Plots produced crops of a quality and quantity deemed satisfactory or good by the participants. Thus phytotoxicity does not appear to be a significant concern, although this variable has not been quantified to date.

The most urgent question which remains to be addressed before a wider scale project can be implemented is the microbiological safety of crops irrigated with greywater. This is the thrust of the present study. Leafy, fruit, root and tuberous crops are being grown under controlled field conditions at the University of KwaZulu-Natal, and growth monitored relative to appropriate controls. Harvested crops will be analysed for both surface and interior contaminations. Soil in which the crops are grown will also be analysed.

Characterisation of microbiologically safe irrigation practices, using greywater, will directly benefit the large number of poor communities in the eThekweni Municipality through enhanced food security and job creation, and can provide an option for closing the water supply and wastewater disposal loop for communities served by groundtanks and dry sanitation.

This study represents a joint initiative between the University of KwaZulu-Natal and eThekweni Municipality.