



Sorption of pathogens during sub-surface drip irrigation with wastewater

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Water scarcity continues to be one of the major threats to human survival in many regions worldwide, such as Africa, the Mediterranean Basin, the State of California in the US. Due to a mixture of factors such as population growth, reduction in water resources availability and higher demand for high quality waters in these regions these countries face water shortage issues that stem from overuse, extensive extraction of groundwater, and frequent drought events. In addition, there are increases in environmental and health awareness that have led to intensive efforts in the treatment and reuse of nonconventional water sources, mainly wastewater and greywater.

One approach to water shortages issues is to use wastewater as means to close the gap between supply and demand. However, the need to treat wastewater and to disinfect it forces additional economic burden on the users, primarily for agricultural irrigation.

A possible solution might be to use the soil as a sorbent for the contained pathogens. Under sub-surface drip irrigation, not allowing the wastewater to reach the soil surface, the pathogens will remain in the soil. It was as well shown in field experiments that the opening size of roots will not allow pathogens to penetrate into the plants. Additional advantages such as water saving, protection of the pipe systems and others are also important. Field experiments in commercial fields just emphasize the main advantages of sub-surface drip irrigation.