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Contamination of soils with microbial pathogens originating from effluent water used for agricultural irrigation

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The use of wastewater for agricultural irrigation is steadily increasing world-wide and due to shortages of fresh water is common today in most arid regions of the world. The use of treated wastewater for agricultural irrigation may result in soil exposure to pathogens, creating potential public health problems. A variety of human pathogens are present in raw sewage water. Although their concentrations decrease during the wastewater reclamation process, the secondary treated effluents most commonly used for irrigation today still contain bacterial human pathogens. A range of bacterial pathogens, introduced through contaminated irrigation water or manure, are capable of surviving for long periods in soil and water where they have the potential to contaminate crops in the field. Therefore, there is a risk of direct contamination of crops by human pathogens from the treated effluents used for irrigation, as well as a risk of indirect contamination of the crops from contaminated soil at the agricultural site. Contradictory to previous notion, recent studies have demonstrated that human pathogens can enter plants through their roots and translocate and survive in edible, aerial plant tissues. The practical implications of these new findings for food safety are still not clear, but no doubt reflect the pathogenic microorganisms' ability to survive and multiply in the irrigated soil, water, and the harvested edible crop.