

再生水短期灌溉对土壤-作物中重金属分布影响的试验研究

Experimental investigation on heavy metal distribution in soil-crop system with irrigation of treated sewage effluent

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中文摘要:

再生水是农业灌溉的重要水资源。该文在田间小区开展了为期4年的再生水灌溉试验, 研究了重金属在土壤-作物系统中的转化与分布规律。结果表明: 短期内重金属在土壤中的累积不明显, 且土壤和作物籽粒中的重金属含量都远低于国家标准规定的允许值, 再生水短期灌溉对土壤环境和作物均不会造成污染影响; 同时, 不同再生水灌溉水量条件下, 土壤中重金属含量无显著差异, 再生水灌溉带入土壤中的重金属量小于作物收获所带走的重金属量, 带出量和带入量对土壤中重金属平衡的影响较小。

英文摘要:

Treated sewage effluent(secondary effluent) is becoming one of the important water resources for irrigation, especially in arid and semi-arid areas. Experiments of irrigation with treated sewage effluent were conducted from 2000 to 2004 in Yongledian irrigation experimental station, Beijing, China. During the period of experiments, fresh water and secondary treated sewage effluent were used for irrigation, respectively. The water quantity for each irrigation was about 450 m³/hm². With data sets of the four years' experiments, the distribution pattern of heavy metals in soil-crop system was investigated. Results indicated that no accumulation evidence of heavy metals was found in soils irrigated with treated sewage effluent, and the concentrations of heavy metals in crop seeds were found much lower than the critical values of Chinese National Standard. It therefore implies that short-term irrigation with treated sewage effluent cannot result in environmental hazard both in soils and field crops in the study area. Meanwhile, no significant difference can be detected for the contents of heavy metals in soils irrigated with different quantities of treated sewage effluent, and the recovery of heavy metals at harvest of winter wheat showed much higher than the total heavy metals added to the soils by irrigation with treated sewage effluent during the winter wheat growing season.

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