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河套灌区土壤水和地下水动态变化及水平衡研究

Dynamic of soil water, groundwater and water balance in Hetao irrigation area

关键词：河套灌区 土壤水 地下水 动态变化 水平衡

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作 者 单位

郝芳华 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

孙铭泽 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

张 璇 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

欧阳威 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

郭波波 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

黄浩波 北京师范大学环境学院,环境模拟与污染控制国家重点联合实验室,北京 100875

摘要：为探究田间土壤水及地下水在不同作物种植区、不同灌期等情况下的动态变化规律与水平衡特征,以春小麦、玉米、向日葵为典型作物,在河套灌区选取4块2亩的试验田,于2009年4—11月采集田间土壤及地下水样品进行研究.结果表明,不同作物地块间土壤含水率的变化差别主要集中在5—9月的作物生长期.夏灌灌水量不足,土壤含水率呈下降趋势,田间土壤水分变化属于"蒸腾蒸发消耗型";秋浇期内水量充足,各地块各土层含水率均明显增加,田间土壤水分呈"入渗补给型".各地块地下水埋深月均变化趋势基本一致,由于优先流的存在,地下水对灌溉降水响应快.本文定量研究了区域土壤水和地下水的变化规律,揭示了灌区水平衡要素间的相互转换关系,可为灌区科学合理的水资源管理提供理论依据.

Abstract: In order to explore the dynamics of soil moisture and groundwater under different crops and irrigation patterns, four experimental plots of 2 Mu in the Hetao irrigation area were selected. The regional dominant crops, spring wheat, corn and sunflower were cultivated in three plots respectively and the other plot acted as the control cell without any crop. The soil and groundwater were sampled from April to November, 2009. The results showed that different soil moisture contents among crops were mainly in the grown period of May to September. The soil moisture content generally decreased during the summer irrigation because of evaporation and transpiration. In the fall irrigation period, the soil moisture change was due to infiltration recharge, different from that of the summer irrigation. Mean monthly groundwater depth of four fields showed little difference. The response of groundwater was sensitive to irrigation and rainfall due to the preferential flow. This study quantified the variation of regional soil moisture and groundwater, and revealed the mutual exchange between the water balances. The conclusion provided a theoretical basis for the scientific and rational management of water resources in the irrigation area.

Key words: Hetao irrigation area soil moisture groundwater dynamic change water balance

主办单位：中国科学院生态环境研究中心

单位地址：北京市海淀区双清路18号 邮编：100085

服务热线：010-62941073 传真：010-62941073 Email：hjkxxb@rcees.ac.cn