



Effects of different water management strategies on soil water-salt movement

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Water shortage threatens the soil environment and agricultural production of arid and semi-arid area. For response of that problem, water recourse management focused on water-saving was used in some irrigation districts. However, to areas plagued by irrigation-induced soil salinity, those measures change the soil, ground water and ecological environment, and break the soil water-salt environmental balance which was maintained for years. So it is necessary to understand effects of different water management strategies on soil water-salt movement.

Based on the data obtained from field observation and experiment of lab in Yonglian plot of Hetao Irrigation Area, Inner Mongolia, China, statistics, Visual MODFLOW and Reservoir Leaching Model were used to construct the variably saturated soil water-salt dynamics model. To evaluate impact of different water management strategies, the scenario analyses was used based on the accomplished coupled model by set various water-saving measures on different water management levels.

The results show that the soil water-salt movement was dramatically influenced by different water management strategies. Different quality of irrigation water leads to non-proportional changes of soil salt accumulation, the drainage, the dry drainage, and groundwater. In addition even with the same quality of irrigation water, different water-saving measures induce different changes of soil water-salt movement and agricultural production.