基于RS、GIS和蚁群算法的多目标渠系配水优化 Water Resources Allocation of Canal System Based on Multi-objective about RS, GIS and Ant Colony Algorithm

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摘 要： 针对渠系配水优化方法存在通用化程度不高的问题，依据作物的水分生产函数，建立以土壤含水率为基础，灌区各种作物该次灌水增产效益最大和灌区水费收入最高的多目标优化配水模型。通过RS技术快速获取灌区土地利用和土壤含水率信息，并以像元为求解单元，通过蚁群算法在GIS系统中对模型进行求解，获得各斗渠满足多目标条件下的最优灌溉配水量。所得结果符合灌区灌溉用水的实际情况，该优化配水方法具有通用性。In view of the existing low efficiency of method problems about the optimization of water allocation of canal system, a multi-objective model about optimization water allocation was established to acquire the highest increased yield benefit and water income of the irrigation district under the basic of soil moisture and the water production function. The information of land use and soil moisture in irrigation area was gained easily by RS technology. The optimization water allocation in each branch under the condition of multi-objective could be obtained by the model solution with ant colony algorithm in GIS system of each the image pixeles. The result accorded with the practical situation of water use in irrigation area. Therefore, this model can be widely used for decision makers to optimize water resources distribution.

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