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Estimation of regional water-saving potential using remotely sensed evapotranspiration data

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ABSTRACT

Estimation of regional water-saving potential is useful to develop the appropriate irrigation scheme and manage water resources. A new calculation method of water-saving potential for crops, based on the remotely sensed evapotranspiration (RS ET) data, is presented in this paper. The regional crop water production function was established based on RS ET and RS yield data. And the ET under the highest crop water use efficiency (WUE) was determined by its crop water production function. A regional crop ET quota was proposed by comparing crop water requirement and the ET under the highest crop WUE. The regional water-saving potential in agriculture was determined by selecting a regional crop ET quota as a standard. The results indicated that: (1) the ET quotas for winter wheat and summer maize were 417 and 313 mm, respectively; and (2) as far as the regional water-saving potential for crops is concerned, summer maize is the largest, at 11.77 million m^3, followed by winter wheat, at 0.73 million m^3; and (3) the water-saving management area and water-saving volumes for main crops among different towns in Daxing county were analyzed. Meanwhile, the major water-saving management towns for wheat and maize were determined. The study will help planners and managers gaining a better insight into water management and water uses of crops.

Keywords: Remote sensing; Evapotranspiration; Crop production; Water use efficiency; Water-saving potential

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