

## 应用DRAINMOD农田排水模型对地下水位和排水量的模拟

### Field application of DRAINMOD model to the simulation of water table, surface runoff and subsurface drainage

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中文摘要:

农田排水工程在防御涝渍灾害、促进农作物正常生长和改善田间耕作管理等方面起着积极的作用,合理的排水系统设计是保证排水系统正常运行、作物正常生长的关键。以水平衡理论为基础建立的DRAINMOD模型,可用于研究排水系统对作物生长和各水文要素的影响,适用于浅地下水位和较湿润地区。该文对模型的基本原理和参数输入要求进行了详细描述,采用加拿大安大略省南部Eugene F. Whelan试验站自由排水和控制排水-地下灌溉两种水位管理条件下,1992~1994年6~8月地下水埋深观测值、3年地表径流和地下排水水量观测值对模型进行了模拟验证。图形显示和统计参数指标分析表明,模拟值与观测值拟合较好,表明模型具有良好的水文模拟性能,可用于预测地下水埋深、地表和地下排水量,是农田排水工程设计和水管理的有效工具。

英文摘要:

Artificial drainage engineering is necessary to prevent the waterlogging disaster, promote the crop growth and ameliorate the farm tillage management. A properly designed drainage system ensures the good operation for drainage system and a suitable environment for plant growth. Based on water balance, DRAINMOD was developed to predict the impact of drainage system on crop growth and hydrology. The model is suitable for shallow water table and relatively humid regions. This paper described the basic theory of model and parameter input requirement. The field data were collected from conventional drainage and controlled drainage/subirrigation plots at Eugene F. Whelan, Woodslee, Ontario, Canada, from 1992 to 1994. The model performance was evaluated by graphical display and statistical indexes. The simulated daily water table during June and August every year, cumulative surface runoff and subsurface drainage from 1992 to 1994 were compared with measured values. The results show that the simulated values were in good agreement with measured values. The model has a good simulation performance for hydrology and can be a useful tool for the design of the drainage system and farm water management.

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