

农学—应用研究

JENSEN模型敏感指数随机误差对耗水量优化计算结果的影响

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摘要:

根据水分生产函数进行耗水量最优分配, 是制定非充分灌溉制度的重要步骤。笔者研究了Jensen模型水分敏感指数随机误差对作物各阶段耗水量优化计算结果的影响。利用棉花灌溉试验数据, 得到了Jensen模型各阶段水分敏感指数及其标准差, 并通过随机模拟计算了作物各阶段最优耗水量的统计特征值。结果表明, 产量和各生育阶段最优耗水量的标准差较大, 随着总耗水量约束的加强, 产量和各生育阶段最优耗水量的标准差逐渐增大。因此, 水分敏感指数的随机波动对最优耗水量计算结果有显著影响, 总耗水量约束越强, 敏感指数随机波动的影响越大。

关键词: 优化计算

Effect of Stochastic Error of Sensitivity Indexes of Jensen's Model on Optimal Water Consumption

Abstract:

Allocating water based on water production function is an important procedure in insufficient irrigation scheduling. The author studied the effect of random fluctuation of sensitivity indexes for different stages of the Jensen model on estimates of crop water consumption. The irrigation experiment data for cotton was used to calculate the water sensitivity indexes and its standard error for different stages in Jensen model. The statistics characteristic value of optimal crop water consumption for different stages was computed through random simulation. The results showed that, the standard errors of yield and the optimal water consumption were considerable. As the restraint of total water consumption was strengthened, the standard errors of yield and optimal water consumption became larger. Consequently, the random fluctuation of the water sensitivity indexes had significant impact on estimates of optimal water consumption. The stronger the restraint of the total water consumption was, the more significant the effects would be.

Keywords: optimization calculation

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参考文献:

- [1] 沈荣开, 张瑜芳, 黄冠华. 作物水分生产函数与农田非充分灌溉研究述评 [J]. 水科学进展, 1995, (03): 248-254.
- [2] 罗遵兰, 冯绍元, 左海萍. 山西省冬小麦水分生产函数模型初步分析 [J]. 灌溉排水学报, 2005, (01): 16-19+27.

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- [3] 张祖莲, 薛继亮, 李远华, 等. 中稻水分生产函数及优化灌溉制度研究 [J]. 节水灌溉, 2001, (06): 20-22+46.
- [4] 王克全. 查哈阳灌区水稻水分生产函数及其优化灌溉制度试验研究 [D]: 东北农业大学, 2008.
- [5] 迟道才, 王瑄, 夏桂敏, 等. 北方水稻动态水分生产函数研究 [J]. 农业工程学报, 2004, (03): 30-34.
- [6] Rajput G S, Singh J. Water production functions for wheat under different environmental conditions [J]. *Agricultural Water Management*, 1986, 11(3-4): 319-332.
- [7] Singh R B, Chauhan C P S, Minhas P S. Water production functions of wheat (*Triticum aestivum* L.) irrigated with saline and alkali waters using double-line source sprinkler system [J]. *Agricultural Water Management*, 2009, 96(5): 736-744.
- [8] 郭群善, 雷志栋, 杨诗秀. 冬小麦水分生产函数Jensen模型敏感指数的研究 [J]. 水科学进展, 1996, (01): 20-25.
- [9] 付强, 王立坤, 门宝辉, 等. 三江平原井灌水稻水分生产函数模型及敏感指数变化规律研究 [J]. 节水灌溉, 2002, (04): 1-3+42-46.
- [10] Kipkorir E C, Raes D, Massawe B. Seasonal water production functions and yield response factors for maize and onion in Perkerra, Kenya [J]. *Agricultural Water Management*, 2002, 56(3): 229-240.

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