

滴灌系统设计水头与工程输配水管网投资及运行的关系分析

Analysis of the relationship between the designed water head and investment and operation of water supply pipe network for drip irrigation system

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英文关键词: [designed water head of drip irrigation system](#) [water supply pipe network](#) [investment](#) [operation](#)

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中文摘要:

滴灌系统设计水头是影响滴灌工程投资与运行费用最为关键的因素, 输配水管网是滴灌工程投资的主体, 涉及到庞大的能耗与运行管理费用。该文从滴灌系统设计水头与工程输配水管网投资及运行的关系等方面进行了分析。结果表明: 在管径一定的条件下系统设计水头与工程输配水管网投资基本成正比例关系, 并与年运行电费成正比例关系, 对流态指数大于0.571的滴灌灌水器, 降低设计水头有利于延长毛管铺设长度或减小流量偏差率提高灌水均匀度, 降低系统运行电费, 减少轮灌组数, 提高管道利用率。该研究可供滴灌产品研发、工程设计与运行管理者参考。

英文摘要:

Designed water head of drip irrigation is the most important factors to affect the investment and operation cost of drip irrigation system. Water transfer pipe network is the principal part of the investment of drip irrigation system and relates to the huge energy consumption and the operation and management cost. The relationships among designed water head of drip irrigation, investment of water transfer pipe networks and operation of drip irrigation system were analyzed. Results show that with the same diameter of the pipe, the designed water head is directly proportional to the investment for the pipe networks and the operation electric cost. For emission exponent of emitter higher than 0.571, decreasing the designed head is favorable to lengthen the lateral or reduce the flow deviation rate, to increase the irrigation uniformity, and also to reduce the operation electric cost and rotated irrigation groups of drip irrigation system, and to improve pipe utility rate. This research provides references for the research and development of the drip irrigation products, the design and system management.

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