吴泽广,张子卓,张珂萌,罗春艳,牛文全,喻黎明.泥沙粒径与含沙量对迷宫流道滴头堵塞的影响[J].农业工程学报,2014,30(7):99-108

泥沙粒径与含沙量对迷宫流道滴头堵塞的影响

Influence of particle size and concentration of sediment on clogging of lab

投稿时间： 2013-10-28 最后修改时间： 2014-01-16

中文关键词：粒径 泥沙 灌溉 含沙量 迷宫流道 滴头 堵塞

英文关键词:particle size sediment irrigation sediment concentration labyrinth channel emitter clogging

基金项目:国家高技术发展计划（863计划）课题（2011AA100507）；自然科学基金项目（51379024）

作者	单位
吴泽广	1. 西北农林科技大学水利与建筑工程学院，杨凌 712100
张子卓	1. 西北农林科技大学水利与建筑工程学院，杨凌 712100
张珂萌	1. 西北农林科技大学水利与建筑工程学院，杨凌 712100
罗春艳	1. 西北农林科技大学水利与建筑工程学院，杨凌 712100
牛文全	1. 西北农林科技大学水利与建筑工程学院，杨凌 7121002.中国科学院水利部水土保持研究所，杨凌 712100
喻黎明	3. 长沙理工大学水利工程学院，长沙 410114

摘要点击次数:**156**

全文下载次数:**68**

中文摘要:

为探明泥沙粒径与含沙量对内镶片式斜齿形迷宫流道滴头的堵塞过程和原因，采用筛分法，分选出6个小于0.1 mm的粒径段采用周期性间歇灌水试验观测流量变化，通过电镜扫描法观测堵塞泥沙结构。试验结果表明：粒径为0.075≤D<0.1 mm和0.03≤D<0.038≤D<0.05和D<0.02 mm的泥沙较难引起堵塞，且含沙量变化对堵塞的影响较小；粒径0.02≤D<0.03 mm和0.05≤D<0.075 mm的泥沙1.3 g/L时，是最易引起堵塞的临界含沙量。当0.038≤D<0.1 mm时，泥沙在流道内不易形成团聚体，造成滴头堵塞的原因是泥沙中凝结成大的团聚体，是造成滴头堵塞的主要原因。

英文摘要:

Abstract: Drip irrigation technology is widely used due to its advantages including high efficiency water saving, ability to adapt clogging has been always a baffled to researchers. Emitter clogging basically has three classes, respectively is physical clogging, che the most common is physical clogging and it is represented by sediment clogging. Studies show that even if the irrigation water after size of sediment particles which are less than 0.1mm get into the emitters causing emitter clogging. However, previous studies on this to research the influence of emitter anti-clogging by emitter structures, test verification is relatively rare and most studies only from a no in-depth study on the clogging mechanism. In addition, the previous researches presents the sediment particle size range which a further verification, sediment concentration corresponding in different size which are easily to cause emitters clogging needs to be st influence of sediment particle size and sediment concentration on the clogging processes of labyrinth channels emitters, periodic inte out using muddy water containing particles with 6 different particle ranges (all less than 0.1 mm) which were screened by means of si are formulated to 0.5,1.0,1.5 g/L of muddy water. Each irrigation time is 30min as same as the test interval, emitters flow collect real-tin group of treatment. In these experiments, the changes of flow discharges were measured under a constant pressure and after the end natural state, then collect the sediment which depositing in the labyrinth channel, at least the locations of sediment clogging were ob to compare the difference between the status quo sediment and the clogging sediment to proven mechanisms that cause clogging of provide a theoretical basis for how to select the appropriate filter. The results show that, the sensitive sediment particle range that c concentration. When the sediment concentration is less than 1.3 g/L, particle size is considered as the main cause of clogging. The n between 0.075-0.1 mm and 0.03-0.038 mm; particle ranges from 0.05-0.075 mm and 0.02-0.03 mm are lesser; while the ranges that most c less than 0.02 mm. When the sediment concentration is greater than the critical value that between 1.2-1.3 g/L, the effect of sediment concentration becomes the main factor to cause clogging. The results also appeal that sediments can easily condense into aggregate particle size range is less than 0.038 mm.

查看全文 下载PDF阅读器

关闭