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细小泥沙粒径对迷宫流道灌水器堵塞的影响

Influence of sediment particle size on clogging performance of labyrinth path emitters

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中文关键词: 粒径,沙粒,含量,迷宫流道,堵塞,灌水器

英文关键词: fine sand particle size sediments concentration labyrinth path emitter

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中文摘要:

为探明细小泥沙粒径对迷宫流道灌水器抗堵塞性能的影响，该文以内镶片式斜齿形迷宫流道灌水器为研究对象，应用类短周期堵塞测验方法对8种粒径小于0.1 mm的泥沙颗粒进行浑水测试。在此基础上，分析了泥沙粒径和含沙量对灌水器堵塞的影响，探讨引起灌水器发生堵塞时的敏感粒径范围与含沙量水平。试验结果表明：对于粒径小于0.1 mm的细小颗粒，含沙量是引起灌水器堵塞的主要原因，当浑水含沙量水平大于1.25 g/L时，影响尤其显著，呈正相关关系；粒径对堵塞的影响并不是单调的递增或递减，堵塞发生的敏感粒径范围在0.03～0.04 mm之间。试验结果有助于进一步提高含沙水源滴灌的应用水平。

英文摘要:

The objective of this study was to investigate the influence of small sediment particles containing in muddy water on anti-clogging performance of oblique dental labyrinth channel drip emitters. A total of 8 types of muddy water with different particle size distribution (all less than 0.1 mm) were tested by short-term clogging tests. Based on these trials, the effect of two factors (sediments’ diameter and muddy water concentration) on emitter’s clogging were analyzed, and then the range of sensitive particle diameters and the level of sediment concentration were discussed.The results showed that the performance of emitters was greatly impacted by the sediment concentration in muddy water with sediment particle size <0.1mm, especially when sediment concentration was greater than 1.25 g/L. This finding indicated the positive relationship between sediment concentration and the clogging process.On the other hand, the sediment particle diameter neither monotonically increased nor decreased the clogging.Emitters are prone to being clogged when particle size ranges between 0.03 and 0.04 mm. The findings from the study will be beneficial for the practical application of muddy water in drip irrigation.

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