

王卫华,王全九,王 铄.土石混合介质导气率变化特征试验[J].农业工程学报,2012,28(4):82-88

## 土石混合介质导气率变化特征试验

### Experimental research on change characteristics of soil air permeability in stony soil medium

投稿时间: 2011-03-21 最后修改时间: 2011-11-04

中文关键词: [土壤](#),[孔隙大小](#),[物理特性](#),[土石混合介质](#),[碎石质量分数](#),[碎石粒径](#),[导气率](#)

英文关键词: [soils](#) [pore size](#) [physical properties](#) [stony soil medium](#) [rock fragment content](#) [rock fragment particle size](#) [soil air permeability](#)

基金项目:国家自然科学基金资助项目(51179150)

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中文摘要:

土壤中碎石的存在改变了土壤结构和孔隙分布,进而影响土壤通气性能。该文通过对碎石单粒径土石混合介质导气率变化特征研究,旨在探讨单粒径土石混合介质导气内在机理,为进一步研究复杂的野外土石混合介质的导气特性提供基础。为了研究土石混合介质中碎石对导气率的影响,该文通过试验研究,分析土壤颗粒小于2 mm的样本(砂土、砂壤土、黏壤土)、碎石质量分数(10%、20%、30%、40%、50%)和碎石粒径(2~3、>3~5 mm)对土石混合介质导气率的影响。结果表明:在土壤颗粒小于2 mm的样本条件下,土壤导气率呈砂土>砂壤土>黏壤土;在相同碎石质量分数的土石混合介质中导气率呈砂壤土>砂土>黏壤土;碎石的存在改善黏壤土的导气性能,使黏壤土碎石混合介质的导气率大于黏壤土的导气率;降低了砂壤土和砂土的导气性能,且砂土的降低幅度远大于砂壤土;在砂壤土中碎石粒径2~3 mm的导气率大于>3~5 mm的导气率;在砂土中碎石质量分数30%之内,碎石粒径>3~5 mm的导气率稍大于2~3 mm的导气率,在40%则相反,但两种粒径下混合介质导气率差异不是很明显。

英文摘要:

Soil structure and pore distribution will be changed by rock fragment, which affects the air permeability and water conductivity. The inherent mechanism of soil air permeability by single rock fragment particle size in stony-soil medium was discussed, which was the basis for investigating the soil air permeability in complex stony-soil medium. Influences of soil air permeability in stony soil medium in different samples?which soil?particle?size?less?than?2mm (sand, sandy loam soil, clay loam soil), different rock fragment contents (10%, 20%, 30%, 40%) and different rock fragment particle sizes (2-3, >3-5 mm) were analyzed. Results showed that the values of samples?with particle?size?less?than?2mm were in the order of sand > sand loam soil > clay loam soil. For the stony soil medium with the same rock fragment content, the values of soil air permeability were in the order of sand loam soil > sand > clay loam soil. The presence of rock fragment improved soil structure and the performance of soil air permeability, made the permeability of stony-soil Medium better than that of clay loam, decreased the air permeability of sand loam soil and sand. And depression amplitude of sandy soil was far larger than that of sandy loam. Soil air permeability of rock fragment particle of >3-5 mm was greater than that of 2-3 mm when the rock fragment content in sand loam soil was less than 30%, and the situation was opposite when the rock fragment content in sand loam soil was 40%; air permeability of stony soil medium was little difference under the two rock fragment particle sizes condition.

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