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四种入渗模型对斥水土壤入渗规律的适用性

Applicability of four infiltration models to infiltration characteristics of water repellent soils

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英文关键词: [soils](#) [infiltration](#) [models](#) [water repellency](#) [cumulative infiltration](#)

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中文摘要:

土壤斥水性影响入渗,进而影响作物产量。国外学者进行了一定的研究,但在中国研究的还很少。该文基于实测资料探讨几种常规的入渗模型在斥水土壤中的适用性。采用室内土柱进行积水入渗试验,对比了不同积水高度和斥水度条件下的土壤入渗规律,并采用4种模型分析了土壤入渗率变化特征。结果表明,累积入渗量随入渗历时的变化可用幂函数描述,不斥水土壤累积入渗量明显大于斥水土壤;累积入渗量与湿润锋推进距离呈良好的线性关系;利用Green-Ampt模型、Philip模型、Kostiakov公式和指数公式对入渗率与入渗历时的关系进行拟合,其中Kostiakov公式更接近于实测值,其他模型拟合效果因斥水程度等因素的不同而异。

英文摘要:

Soil water repellency has great influence on soil infiltration, thereby affecting crop yields. Foreign scholars have conducted some related researches before, but the research is still limited in China. This work discussed the adaptability of four infiltration models in infiltration characteristics of water repellent soils based on laboratory experiment data. Indoor soil column experiments were used to carry out the experiment of ponding infiltration to compare infiltration laws of soils in different ponding depths and repellency degree. Four models were used to analyze the characteristics of the soil infiltration rates. Results showed that the change of cumulative infiltration volume with the change of time can be expressed by power function, the amount of cumulative infiltration of wettable soil was obviously more than that of the water repellent soil. There was good linear relationship between the amount of cumulative infiltration and the wetting front distance. Green-Ampt model, Philip model, Kostiakov equation were used to simulate infiltration rate. Kostiakov equation had the best results and other models had different results for infiltration rates of different repellency soils. The infiltration ability of repel soil was obviously slower than that of the wettable soil.

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