

研究报告

覆膜开孔土壤蒸发实验研究

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收稿日期 2003-10-23 修回日期 2004-10-28 网络版发布日期 接受日期

摘要

为获得灌后覆膜开孔蒸发过程中土壤含水率分布的动态资料, 研制了室内垂直一维入渗-覆膜开孔蒸发动态观测实验系统, 并进行了不同覆膜开孔率和不同入渗定额下的覆膜开孔蒸发实验. 根据实测资料分析了土表覆膜开孔率和入渗定额不同条件下, 蒸发土壤含水率剖面的时间变化和蒸发结束的含水率剖面特征. 累积蒸发量随时间变化趋势表明, 两者关系符合Gardner理论关系, 且该理论关系系数与不同覆膜开孔率和入渗定额存在进一步的函数关系, 从而得出覆膜开孔率和入渗定额影响下的累积蒸发量随时间变化多因子模型. 同时, 采用类似的方法分析了覆膜开孔率和入渗定额对相对累积蒸发量和单位膜孔面积累积蒸发量的影响, 得出了定量函数关系, 其拟合的相关系数均很高.

关键词 [覆膜开孔率; 累积蒸发量; 入渗定额](#)

分类号

Soil evaporation under perforated plastic mulch

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Abstract

In arid and semiarid regions of northwestern China, where evaporation exceeds precipitation, perforated plastic mulches are widely used to decrease soil water evaporation. To determine the effects of various perforated plastic mulches on soil water evaporation after irrigation, a soil column experiment was conducted, which consisted of six mulches with different perforated rates and four levels of irrigation, and the soil water evaporation from each soil column was measured. The results showed that with 100% perforated mulch, the cumulative evaporation was 2.8~48.5 times higher than that of the control, and increased with increasing irrigation amount. There was a linear relationship between cumulative evaporation and time, which followed the Gardner's theory of bare soil evaporation. A three-factor (evaporation time, perforated rate and irrigation amount) function of cumulative evaporation and the functions of relative cumulative evaporation and cumulative evaporation per unit hole area film were established, which fitted the observed data very well.

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Key words [Open holes ratio of plastic mulch](#) [Cumulative evaporation](#) [Perforated rate](#)

DOI:

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