

蒸发条件下浅层地下水埋深夹砂层土壤水盐运移特性研究

Water and salt transport in sand-layered soil underevaporation with the shallow under ground water table

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中文摘要:

针对西北地区土壤剖面多呈层状和春季强烈返盐土壤多处于裸露状态的特点, 通过室内土柱实验, 研究了浅层地下水埋深条件下夹砂层土壤中砂层的层位、厚度以及级配等因素对水盐迁移特性的影响。结果表明, 砂层位于底层即层位为0时可加速水盐运动; 层位为10 cm时可抑制其运动; 层位为35 cm时砂层对潜水蒸发量和土壤表层返盐的抑制率可达70%~80%左右。砂层对水分和盐分的抑制率随蒸发历时的延长而减小, 但层位为35 cm的砂层对盐分的抑制率随蒸发历时的延长而增加; 同一历时砂层对水分的抑制率小于对盐分的抑制率。相同层位时, 水盐的抑制率随砂层厚度的增加以及级配的变差而增大。该研究为层状土区盐碱地的改良以及灌溉和排水等措施的制定提供了参考。

英文摘要:

Considering the fact that most soil profiles assume layered structure and that most bare soils are exposed to the atmosphere when salt accumulation in the surface soil was very rapid in northwest region of China. The impacts of sand position, sand thickness and sand particle distribution of sand-layered soil with the shallow ground water table on water and salt transport were analyzed through the experimental columns. The results showed that water and salt transport was accelerated when the distance between the low boundary of sand layer and the water table was zero, and that it was depressed when the distance was more than 10 cm. The controlled amount for the sand layer against the water and salt transport was 70%~80% when the distance was more than 35 cm. The effect of the sand layer against the water and salt transport decreased with the increase of the evaporation duration except for the treatment with 35 cm distance, and the effect of the sand layer against salt transport was more than the effect against water transport at the same evaporation duration. In addition, the effects against water and salt transport were intensified for the treatments with the thicker sand layer and the worse sand distribution. The study is very important for preventing soil from secondary salinization and guiding irrigation and drainage.

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