

农学—研究报告

河北棉田复合种植模式水分利用比较研究

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摘要:

河北南部植棉区受麦玉两熟高耗水农作模式的影响,地下水位亏缺,生态恶化。受此影响,当地棉田在保证高效的同时也存在着节水或提高水分利用效率的需求。通过设计新型的棉田复合种植模式,从水分效益与经济效益两个方面对各种种植模式的水分利用情况进行比较分析,探讨不同种植体系的耗水规律,筛选出水分经济利用效率高、实现农田水分生态修复的棉花种植模式。研究表明:设计的5种种植模式中辣椒/棉花间作的水分经济利用效率(EWUE)最高,达60.29元/(mm²·hm²),其次为马铃薯/棉花间作,因此,辣椒/棉花间作与马铃薯/棉花间作是该区域具有推广可行性的两种棉田种植模式。5种棉田种植模式能够维持田间水分的周年平衡,其中辣椒/棉花间作能够对地下水资源起到较好的生态补偿作用。黑麦—棉花轮作模式和苜蓿/棉花间作模式在利用深层水分方面更具比较优势。

关键词: 耗水规律

Water Use Efficiency Analysis of Different Cotton Multiple Cropping Pattern in Hebei Province

Abstract:

Under the high water consumption pressure of wheat-maize cropping pattern, the cotton production area in southern Hebei is facing groundwater deficit and ecological deterioration problems. For this reason, there is demand for the improvement of water use efficiency and enhancement in local cotton field. The purpose of this research was to evaluate and select the optimum cotton cropping system, which could improve water use efficiency, alleviate water stress and achieve ecological restoration of soil moisture. This research designed five cotton multiple cropping patterns, and adopted comparative analysis of water use efficiency in these cropping models. Results showed that: the pepper/cotton intercropping pattern gained the highest EWUE 60.29 yuan/(mm²·hm²), followed by the potato/cotton intercropping pattern. Therefore, these two cotton planting patterns were suggested to be applied to practical cotton production. All the five cotton cropping patterns maintained the field annual water balance. The pepper/cotton intercropping pattern played a good role of ecological compensation in groundwater resource. The rye-cotton rotation pattern and alfalfa/cotton intercropping pattern had comparative advantage of deep water utilization.

Keywords: law of water utilization

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