

## 秸秆覆盖对夏玉米农田土壤水分与热量影响的模拟研究

### Simulation study on influence of straw mulch on soil moisture and heat of summer corn farmland

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中文摘要:

利用试验实测资料确定作物根系吸水模型和水热运移模型的参数, 分别利用有限差分法对水热运移模型进行离散和迭代法对模型进行求解, 通过模拟研究秸秆覆盖对夏玉米农田土壤水分和热量的影响。研究表明该模型能描述不同覆盖率条件下夏玉米生育期农田土壤水分和热量的变化规律, 土壤含水率在0~40 cm逐渐减少, 在40~100 cm逐渐增大; 土壤温度在0~20 cm逐渐减少。不同覆盖率下土壤含水率和土壤温度的变化规律均为覆盖率150%>覆盖率100%>覆盖率50%>不覆盖。可见秸秆覆盖节水 and 控温效果明显, 为节水条件下的作物高产提

英文摘要:

The parameters of root-system water-absorbing model and the water and heat transportation model of crop based on experimental data were determined, which were solved by using finite difference and iterative methods. The simulations of water and heat transportation were performed under straw mulch on water and heat of summer corn farmland. The results show that these models can describe the laws of water and heat transportation based on different mulch rates in the summer corn farmland, i.e., the soil water content decreases in the 0~40 cm and increases in the 40~100 cm, the soil temperature decreases in the 0~20 cm. The transportation laws of soil moisture and soil temperature are shown as follows: mulch rate 150%> mulch rate 100%> mulch rate 50%> no mulch under different mulch rates. Straw mulch has the obvious effects of water saving and temperature controlling, which lays a theoretical foundation for crop high-yield under water saving irrigation condition.

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