

土壤水分对夏玉米农田CO₂通量和群体水分利用率的影响

Influence of Soil Water on CO₂ Flux Density and Group Water Use Efficiency in Summer Corn Field

投稿时间: 1999-5-14

稿件编号: 19990323

中文关键词: 夏玉米; 土壤水分; 二氧化碳通量; 群体水分利用率

英文关键词: summer corn; soil water; CO₂ flux density; group water use efficiency

基金项目: 国家自然科学基金“八五”重大项目

| 作者 | 单位 |
|-----|------------|
| 杨晓光 | 中国农业大学 |
| 于沪宁 | 中国科学院地理研究所 |

摘要点击次数: 5

全文下载次数: 15

中文摘要:

利用CO₂分析系统,配合波文比装置,在夏玉米全生育期连续测定农田冠层瞬时CO₂浓度差及农田小气候特征量,并计算了农田冠层瞬时CO₂通量密度、潜热通量和群体水分利用率。结果表明,群体光饱和点位移是受土壤水分影响的一个辐射能量范围,充沛的太阳辐射能量只有充足水分条件的耦合,才能发挥生产力效益;群体水分利用率与0~60cm土层土壤平均相对含水率呈负相关,土壤相对含水率在30.3%~80%范围内,水分利用率随相对含水率的增加而降低。

英文摘要:

The instantaneous CO₂ flux concentration gradient 0.5m and 2.0 m higher above the canopy was measured with an infra red CO₂ analysis system during the growing season of summer corn. The field microclimatic factors such as radiation, temperature and moisture were measured simultaneously using the Bowen ration device, and the CO₂ flux density, latent heat flux and water use efficiency were also calculated. The results showed that the CO₂ analysis system was effective as the CO₂ flux density had the same variation trend as dry matter, and it proved useful as an advanced method to calculate the water use efficiency. The relationship between net photosynthesis rate and global radiation can be expressed as parabolic equation. When radiation reaches the light saturation point, the net photosynthesis rate will not increase any more. The light saturation point was affected by soil water content, and the radiation energy can make productive effect only with the affluent soil water. There was negative correlation between group water use efficiency and the relative water content in 0~60 cm soil. When the relative water content was in the range of 30.3%~80%, the water use efficiency decreased with the increase of soil water content. Some measures can be taken to develop the root to absorb the deep soil water and can increase the water use efficiency while the water supply did not increase.

[查看全文](#)

[关闭](#)

[下载PDF阅读器](#)

您是第607236位访问者

主办单位: 中国农业工程学会 单位地址: 北京朝阳区麦子店街41号

服务热线: 010-65929451 传真: 010-65929451 邮编: 100026 Email: tcsae@tcsae.org

本系统由北京勤云科技发展有限公司设计