中国农学通报 2011, 27(第8期4月) 40-46 DOI: ISSN: 1000-6850 CN: 11-1984/S

园艺—研究报告

遮荫处理对丘陵茶园生态环境及茶树气体交换的影响

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摘要:

以遮光率分别为75%、56%和30%黑色遮阳网为试验材料，以不遮光为对照，研究不同遮光处理对茶园生态环境及茶树叶片气孔气体交换的影响。结果表明，遮阳网覆盖可有效改善茶树生长的生态环境，与不遮光茶园相比，75%、56%和30%遮光率处理的茶园光合有效辐射明显降低，日平均气温分别比对照低1.7℃、1.1℃、0.7℃，日平均地表温度分别比对照低8.2℃、5.7℃、3.5℃，日平均5 cm土壤温度分别低5.4℃、3.4℃、2.3℃。空气相对湿度则分别比对照高2.7%、1.6%、0.9%。75%遮光率处理与空白达显著差异，新梢1芽3叶含水量比对照高21.8%，第3片成熟叶的平均叶面积比对照高8.96 cm2。75%和56%遮光率处理的茶园净光合速率日变化进程呈现单峰曲线，30%遮光率处理和不遮光处理的茶园为双峰曲线，各处理全天的净光合速率大小依次为56%遮光率>75%遮光率>30%遮光率>不遮光。同时，蒸腾速率随遮荫率的增加而上升，56%和75%遮荫率下气孔导度呈单峰曲线，30%和未遮荫处理茶园则呈双峰曲线。

关键词: 丘陵茶园

Effects of Shading on Eco-environment and Leaf Gas Exchange of Tea in Hilly Tea Plantation

Abstract:

To analyze the influence of shading on the environment of tea plantation and leaf gas exchange characteristics of the tea, four different levels of shading (75%, 56%, 30% and 0%) were designed with different black shade cloths in summer. The results showed that shading improved the ecological environment of tea plantation effectively, the photo synthetically active radiation under 75%, 56% and 30% shading treatments decreased significantly compared with the control treatment. The daily average air temperature under 75%, 56% and 30% shading treatments were 1.7℃, 1.1℃ and 0.7℃ lower than in the control, and daily average soil surface temperature was 8.2℃, 5.7℃, 3.5℃ lower compared with that under the control. In addition, the daily average temperature of the 5 cm soil profile was 5.4℃, 3.4℃ and 2.3℃, lower than in the control, respectively. Humidity increased as temperature decreased. Relative humidity under 75%, 56% and 30% shading was 2.7%, 1.6%, 0.9% higher than in the control. Besides, significant difference was found between the 75% shading and the control treatment. The water content of one-bud-three-leaves was 21.8% higher and the average leaf area of the third mature leaf was 8.96 cm2 larger than those of control. Diurnal variation of net photosynthetic rate of tea was single-peak curve under 75% and 56% shading and bimodal curve under 30% and control. The total net photosynthetic rates of different treatments was in the order of 56%＞75%＞30%＞0%. At the same time, transpiration rate increased as the shading intensity become higher. Stomatal conductance showed a single peak curve under 56% and 75% shading, while it showed bimodal curve under 30% shading and control treatment.

Keywords: hilly tea plantation

收稿日期 2010-10-14 **修回日期** 2010-12-13 **网络版发布日期** 2011-04-15

DOI:

基金项目:

中国科学院知识创新工程重要方向项目“丘陵茶园生态管理研究与应用”;广西区科技合作与交流重点项目“融水山区茶园生态管理研究与示范”;广东省中国科学院全面战略合作项目“华南地区生态茶园关键技术研究与示范”

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