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叶温测量仪的研制及其在叶片参数测量中的应用

Development of leaf temperature measuring instrument and its application in plant leaf parameter measurement

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英文关键词: [equipments](#) [design](#) [experiments](#) [leaf temperature measuring](#) [plant canopy-air temperature difference](#) [leaf thickness](#) [correlation](#)

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中文摘要:

为探索植物自身水分状态,研究叶气温差与叶片厚度变化,自行研制了叶温测量仪,同时利用YI-201020植物叶片参数测量仪,对辣椒和花生不同生长阶段的叶片温度和叶片厚度进行监测,结合环境温度,并对各个生长阶段的叶气温差和叶片厚度作相关性分析,结果表明:传感器线性度为1%,回程误差0.02 V,灵敏度为0.04 V/°C,分辨力为0.3°C,仪器在测量范围0~90°C下最大示值误差为0.27°C,得到仪器的扩展不确定度为0.41°C;叶气温差和叶片厚度在各个时期都呈显著的正相关,其中成长期显著性最为明显。研究结果对植物物理学研究有参考价值。

英文摘要:

In order to explore the reveal water state of plant, and research the plant canopy-air temperature difference and leaf thickness variation, the leaf temperature measuring instrument was developed, meanwhile, the YI-201020 leaf thickness precision instrument and leaf temperature measuring instrument were applied to monitor the leaf thickness and leaf temperature of chilies and peanuts at different stages, then the correlations between plant canopy-air temperature difference and leaf thickness after taking ambient temperature into consideration were analyzed. The experimental results showed that: the sensor linearity was 1%, the return error was 0.02 V, the sensitivity was 0.04 V/°C, the resolution was 0.3°C, the maximum indication error of instrument in the range of 0~90°C was 0.27°C, and the expanded uncertainty was 0.41°C; the leaf thickness was in negative relationship with canopy-air temperature difference at every stage of the two plants, especially during the growth stage. The results in this paper provide a reference for the plant physics research.

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