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可调LED光源系统设计及其对菠菜生长的影

Design on LED flexible light system and its effect on growth of spinach

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中文摘要:

为提供设施农业装备运用的人工光源,进行了发光二极管(LED)光源系统的硬件及软件设计,并通过以荧光灯为对照对6种柔性组合的LED光源,进行了菠菜生长试验。研究发现该系统具有光质、光强、光周期及占空比柔性可调,可以作为设施补光及光生物学研究的理想光系统。在该光系统下的菠菜生长试验发现,菠菜在红蓝黄(RBY)光处理下叶柄长、叶面积、叶柄粗及根长都显著大于其他处理,生长较其他处理健壮,且RBY光处理菠菜光合色素质量分数显著高于其他处理,表明在红蓝复合光的基础上添加黄光有利于光合色素的合成,并显著地促进菠菜的生长,同时也表明该LED光源系统对开展植物补光应用具有一定的现实意义和使用价值。

英文摘要:

In order to introduce effect of the light emitting diodes (LED) light system on growth and chlorophyll content of spinach, hardware and software of the flexible controlled LED light system were designed. The growth test of spinach under six different light quality LED and set fluorescence lamp as control was carried out. The result showed that light quality, light intensity, photoperiod and duty cycle the LED light system could be flexible controlled and were good light system for supplement light or researches of photobiology. The result of growth experiment in spinach under the light treatments showed that petiole length, leaf area, petiole and root length of the red, blue and yellow (RBY) LED treatment were significantly greater than those of other treatments, and more robust. Furthermore, photosynthetic pigment content of the RBY treatment was significantly higher than other treatments. Supplement yellow light on the basis of the red and blue composite light was benefit to synthesize photosynthetic pigments and significantly promote the growth of spinach.

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