

Effects of Different Spectra Supplemental Light Treatments on the Quality of Red Leaf Lettuce Seedlings¹

Chih-Ying Yu² Yu-Chiao Chung³ Li Lin⁴

Abstract

Red leaf lettuce seedlings often develop poor red color when grown in facilities. Especially in the Yilan area, the weather in autumn and winter is often in low light and high humidity environments, which makes it easier for the red leaf lettuce seedlings in facilities to appear green and develop shade-avoidance syndrome (SAS), with thin stems, reduced leaves and slow root growth. SAS caused problems such as slow growth, which led to extended seedling cultivation time and reduced seedling quality, affecting subsequent growth and yield. This study explored the effect of supplemental light treatment with different spectra (R:B=1:0, R:B=9:1, R:B=7:1, R:B=5:1, R:B=4:1, R:B=3:1, R:B=2:1) on the growth and quality of red leaf lettuce 'Red Butter' seedlings, and the natural light source in the glass greenhouse was used as the control group. The results showed that supplemental light treatment could significantly improve the growth performance of red leaf lettuce seedlings. Among them, the stem diameter of seedlings treated with R:B=4:1 supplemental light treatment increased by 93%, the number of leaves increased by 66%, the seedling strength index was 9.68 times that of the control group, and the absolute growth rate was 5.24 times that of the control group. R:B=4:1 supplemental light treatment is the best ratio of red and blue light to improve the quality and growth rate of red leaf lettuce seedlings.

Keywords: shade-avoidance syndrome (SAS), LED, red light, blue light

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2. Assistant researcher, Lan-yang Branch Station, Hualien DARES.

3. Contract-based assistant, Lan-Yang Branch Station, Hualien DARES.

4. Associate researcher, Division of Crop Environment, Hualien DARES.