

ABSTRACT

Artificial lighting affects plant growth in global warming conditions. Artificial lighting cannot cope with the negative impact of global warming on plant growth. Artificial lighting can promote plant growth under ideal conditions, but the influence of global warming on those plants is still greater. Therefore, to reduce the impact of global warming on plant growth, greater actions such as reducing greenhouse gas emissions and increasing awareness of the importance of maintaining environmental balance are needed. This study aimed to test the effectiveness of using artificial lighting on lettuce plant Microgreens based on Arduino nano microcontrollers. The artificial lighting used in this study is blue and red LED lights, which are connected to a microcontroller to control the ratio and brightness of the LEDs produced. The number of LEDs used is 150 pieces, with ratios used of 1: 1, 1: 2, and 2: 3. The BH1750 sensor is used to measure the intensity of light produced by LEDs with the ratio used. The study was conducted using an experimental method by comparing the lux value obtained by LEDs based on the ratio and growth results of lettuce plants (plant height, number of leaves, and fresh weight) during the testing process based on the ratio used. Sensor tests have an error value of 5.9% at a measuring distance of 8 cm; 1.6% at a measuring distance of 23 cm; and 6.2 % at a measuring distance of 14 cm. The planting results show that plants can grow using a ratio of 1: 1, 1: 2, and 2: 3, with the height of the plants obtained ranging from 2 to 3 cm. But at a ratio of 2:3 there is a delay in lettuce growth.

Keywords: *Artificial light, Lettuce, LED, Global warming*