

EXPLORING THE EFFECT OF “WHITE LIGHT” ON THE GROWTH, LEAF MORPHOLOGY AND PHYSIOLOGY OF SPINY CICHORY PLANTS (*Cichorium spinosum* L.) IN A VERTICAL FARM

O. Voutsinos-Frantzis¹, D. Savvas¹, G. Liakopoulos², L. Marcelis³, G. Ntatsi¹

1. Agricultural University of Athens, Department of Crop Science, Laboratory of Vegetable Crops, Iera Odos 75, 11855 Athens, Greece
2. Agricultural University of Athens, Department of Crop Science, Laboratory of Plant Physiology, Iera Odos 75, 11855 Athens, Greece
3. Wageningen University and Research, Horticulture and Product Physiology Group, P.O. Box 16 6700AA, Wageningen, the Netherlands

Abstract

Light emitting diodes (LED) technology has contributed significantly to the rapid development of the vertical farming sector. Even though “white light’s” applications for the human lighting have reduced the cost of the initial investment compared to that of “specialized” horticultural lamps, most of the research focuses on blue (B) and red (R) spectra. In the present study, three different kinds of “white light” were used, a “neutral” (N), a “full” (F) and a “SunLike” (S) with B:G:R:FR ratios 14:32:43:10, 16:36:40:8 and 21:34:36:7, respectively. During the experiment, *Cichorium spinosum* L. plants were grown in a vertical farm for 36 days, with a light intensity of 300 $\mu\text{mol m}^{-2} \text{s}^{-1}$ and 12-hour photoperiod. A few days before the plants reached the commercially salable stage, gas exchange measurements were conducted to determine whether the type of light had any significant effect on the photosynthetic capacity of the plants. In addition, leaf morphological characteristics such as leaf thickness, spongy and palisade parenchyma thickness, stomatal density and stomata size were measured. Moreover, the number of leaves, their surface area, and the fresh and dry weight of the edible leaves were measured during harvest. The results showed that the productivity, general morphology and photosynthetic capacity of *Cichorium spinosum* L. was not significantly affected by the type of white light used in this work.

Key words

Spiny chicory, stamnagathi, vertical farming, photosynthesis, white light