

OPTIMIZATION OF GROWING CONDITIONS TO ENHANCE THE GROWTH PERFORMANCE OF MUNG BEAN MICROGREENS

S. A. R. K. Gunawardhana^a, I. G. H. I. Jayakody^a, M. P. M. Arachchige^b, and U. G. A. T. Premathilake^{a*}

^aDepartment of Export Agriculture, Faculty of Animal Science and Export Agriculture, Uva Wellassa University of Sri Lanka, Badulla, Sri Lanka.

^bDepartment of Food Science and Technology, Faculty of Animal Science and Export Agriculture, Uva Wellassa University of Sri Lanka, Badulla, Sri Lanka.

*apekshika@uwu.ac.lk

Abstract

Mung bean (*Vigna radiata*) microgreens are immature seedlings with fully developed cotyledons, often accompanied by true leaves which are emerging as a highly nutritious and fast-growing functional food, rich in vitamins, minerals, and antioxidants. Optimizing their growing conditions is essential to improve seedling growth of crop in a cost-effective manner. Despite global popularity, microgreens in Sri Lanka are mostly limited to tourist-focused restaurants, with low local awareness and limited research. This study aimed to optimize the growing conditions to enhance the growth of mung bean microgreens. Three different experiments were conducted under a completely randomized design with three replicates to determine the optimum sowing density, the most effective growing medium, and the best seedling growth stage to harvest. Treatments included three sowing densities (1, 2, and 3 seeds/cm²), four growing media (compost + coir dust 1:1 v/v, compost + paddy husk charcoal 1:1 v/v, tissue paper with 50 ppm Albert solution, and tissue paper only), and three seedling growth stages (5, 7, and 10 days after sowing). Results showed that 3 seeds/cm² gave the highest biomass (127.17^a±6.73 g fresh weight; 10.09^a±0.38 g dry weight), but based on growth performance, crop coverage, canopy uniformity, and economic considerations, the optimal sowing density was 2 seeds/cm². Compost-coir dust mixture was identified as the most effective growing medium producing the tallest shoots (13.11^a±0.23 cm) and the highest fresh weight (85.91^a±10.73 g). Considering yield performance (78.48^a±1.58 g fresh weight; 7.98^a±0.16 g dry weight) and sensory attributes, harvesting mung bean microgreens at 7 to 10 days after sowing was identified as the most suitable stage. In conclusion, the optimal sowing density was two seeds/cm². The seedling performance was best in compost and coir dust (1:1 v/v) as the growing medium for harvesting tender seedlings at 7 to 10 days after sowing. This combination significantly enhanced seedling growth, offering a practical approach for efficient mung bean microgreen production.

Keywords: *Growing Media, Harvesting Stage, Mung Bean, Sowing Density*

Financial assistance from UWU Research Grant, Uva Wellassa University of Sri Lanka (Grant No. UWU/RG/2024/11) is acknowledged.