



Hungarian University of Agriculture and Life Sciences

Institute of Horticultural Engineering

Budai Campus

Master's education

OPTIMAL VERMICOMPOST RATIOS FOR LETTUCE SEEDLING GROWTH

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Abstract:

This thesis delves into the potential of vermicomposting as a sustainable alternative to peat moss in organic seedling production. The study examines the effectiveness of different ratios of vermicompost-to-peat in promoting the growth of organic lettuce seedlings. The research explores two substrates of vermicompost (fresh and old), two plant species (*Lepidium sativum* and *Lactuca sativa*), and six treatment ratios, with two controls for each plant species. For *Lepidium sativum*, 100% peat with 0% nutrients This thesis investigates the potential of vermicomposting as a sustainable alternative to peat moss in organic seedling production. The study examines the effectiveness of different ratios of vermicompost-to-peat in promoting the growth of organic lettuce seedlings. The research explores two substrates of vermicompost (fresh and old), two plant species (*Lepidium sativum* and *Lactuca sativa*), and six treatment ratios, with two controls for each plant species.

For *Lepidium sativum*, 100% peat with 0% nutrients were used, while for lettuce seedlings, a commercially available certified organic growing media "Klasmann KKS proline (Bio) potground" was utilized to ensure adequate nutrient supply instead of using peat alone. Data collection was conducted from January to April 2024, measuring parameters such as germination tests, shoot and root height, chlorophyll content, fresh/dry weights, and dry matter content.

The results indicate that while germination rates did not vary significantly, vermicompost ratios influenced seedling growth, with higher ratios favoring lettuce production in fresh vermicompost and affecting growth in old vermicompost. The maturity and phytotoxicity levels differed depending on the age of the vermicompost, which had discernible impacts on seedling quality. The recommended ratios of 50% for fresh and 20% for old vermicompost exhibited optimal seedling growth.

Future research should explore the nuances of substrates and investigate vermicompost's broader application in sustainable agriculture, aligning with Prajapathi et al.'s (2023) eco-friendly waste management paradigm.

