

EFFECT OF COIR DUST-BASED GROWTH MEDIA ON GROWTH, CROP YIELD, FIELD DISEASES AND NUTRITIONAL QUALITY OF GREEN BEAN (*Phaseolus vulgaris* L.) RAISED IN A PROTECTED HOUSE

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Green bean (*Phaseolus vulgaris* L.) is a valuable legume crop that is highly vulnerable to pests, diseases, and environmental stress. This study evaluated the feasibility of cultivating *P. vulgaris* cv. HORDI Bean 3 in soilless media under glasshouse conditions as an alternative to conventional soil-based methods. Plants were grown in plastic pots using five different soilless media (T1 – T5), comprising coir dust, coir chips, and partially burned rice husk (PBRH) in ratios of 60:40:0, 60:30:10, 60:20:20, 60:10:30, and 60:0:40, respectively. A soil-based mix of sand, topsoil, and cow dung (1:1:1) served as the control (T6). Each treatment included six replicates arranged in a randomised complete block design (RCBD). Fertigation was provided using Albert's solution for soilless media and a mixture recommended by Department of Agriculture as the control. Crop growth parameters, disease severity, and yield were monitored throughout the growth cycle. Seedlings failed to establish in T1 and T2. Early growth stages in the other soilless treatments showed reduced leaf and flower development, but by the end of the cycle, no significant differences in growth or yield were observed compared to control. Elevated glasshouse temperatures (27 – 34) °C caused flower drop across all treatments. No pest or disease incidence occurred in any treatment. X-ray fluorescence spectroscopic analysis revealed higher silica (Si) concentrations in pods from soilless treatments, likely attributed to the presence of PBRH, rich in Si. Levels of nitrogen, phosphorus, potassium, manganese, iron, copper, and molybdenum in the pods were consistent across treatments, while the control showed significantly higher levels of magnesium, calcium, sulfur, chlorine, and zinc. The results suggest that soilless cultivation of green beans in a glasshouse can reduce disease risks while maintaining yield and quality comparable to soil-based systems. Further trials, particularly during the rainy season, are recommended to validate these findings.

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