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**Study on growth and yield performances of coated seeds of finger millet (*Eleusine coracana* L.) under mechanical planting**

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**Abstract**

Finger millet (*Eleusine coracana* L.) is a highly productive and nutrient-rich crop in Sri Lanka, where it is mainly cultivated using rain-fed methods and the broadcasting technique. However, this method results in significant seed wastage due to the small size of the seeds, and thinning requires additional labor. To address this issue, mechanical planting is recommended, which requires larger seed sizes to be compatible with machinery. During the 2021-2022 *Maha* season, the experiment was carried out at the Division of Agronomy, Grain Legume Oil Crop Research and Development Centre, Angunukolapalessa (GLORDC) to standardize seed size for mechanical planting and analyze coated seeds in the field. The finger millet cultivar Rawana seeds were utilized, and seed size was standardized through the addition of talc powder as a filler and gum arabic as an adhesive. Diatomaceous earth (DME), Carboxy Methyl Cellulose sodium salt (CMC), Manioc starch, Maize cob based biochar powder, and Triple Super Phosphate (TSP) powder were also added to the coating media to optimize binding and moisture absorption while also increasing nutrient content, which is important during the early growth stage. The coated and naked seeds were tested using Randomized Complete Block Design (RCBD) with three replicates in three distinct planting methods: (a) broadcasting, (b) row planting, and (c) machine planting. As a result, the coated seed size was increased from 1.2mm (average diameter of naked seed) to 3.94mm (average diameter of coated seed) with two average numbers of seeds in one coated seed. Although the 359 naked seeds were recorded in 1g, only 72 coated seeds were included in 1g of seeds. The naked seeds broadcasting method produced the lowest growth and yield parameters (days to first and 50% flowering, number of tillers, number of ears, and average yield per plant). The average seed rate could be reduced by half (from 6kg/ha to 3.06kg/ha) compared to the naked seeds broadcasting method. Substantial quantity of seed rate was necessary in naked seed row planting (7kg/ha) and more manpower also required for thinning out and application of other agronomic practices to the seedlings. The highest average yield per plant (39.12g/plant) was recorded in mechanical planting of coated seed. Therefore, seed coating and mechanical planting technique can be used to improve the productivity of finger millet production in Sri Lanka. Further identification and modification of mechanical planters are most important to improve the efficiency of the process.

**Key words:** Broadcasting, Finger millet, Machinery Planting, Row planting, Seed coating

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