

PERFORMANCE EVALUATION OF CAMERA-INTEGRATED, AND HEIGHT-ADJUSTABLE SPICE PICKER FOR HARVESTING CLOVE AND NUTMEG

**N.W.K.G. Nanayakkara, E.J. Kosgollegedara, G.V.T.V. Weerasooriya,
P.D. Kahandage and S. Karthigayani**

Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka.

Manual harvesting of clove (*Syzygium aromaticum*) and nutmeg (*Myristica fragrans*) is a labour-intensive and expensive practice. Therefore, a mechanical picker has been developed for clove and nutmeg harvesting. However, the picker has not yet been tested for its performance. This study compared the performance of the picker with the manual harvesting of clove and nutmeg. The evaluation was carried out in clove and nutmeg plantations in the Matale district. The selected trees were similar in height (15-20 m), structure and age. Performance was evaluated at two different height levels (HL1 up to 3 m and HL2 up to 3-6 m) for each crop. Statistical analysis revealed no significant effect of height level on manual harvesting of either crop. However, the actual harvesting capacities and efficiencies of picker was significantly greater ($p < 0.05$) in HL1 than HL2 for both crops. The mean actual harvesting capacities for the clove and nutmeg were 6.02 kg h^{-1} and 5.87 kg h^{-1} , respectively for picker which varied as $473 \text{ fruits h}^{-1}$, $412 \text{ fruits h}^{-1}$, respectively for manual method. The efficiencies for clove in picker and manual methods were 85.6% and 84.4%, respectively and efficiencies of picker and manual methods for nutmeg were 75.9% and 74.5%, respectively. The actual harvesting capacity of clove was not significant ($p > 0.05$) for either picker or manual methods. Further, the actual harvesting capacity of nutmeg, efficiency of picker for clove and nutmeg were significantly greater ($p < 0.05$) compared to the manual method. The picker's break-even points for clove and nutmeg were 116 kg yr^{-1} and $47,222 \text{ fruits yr}^{-1}$ respectively, it can be recommended for clove and nutmeg harvesting in Sri Lanka.

Keywords: Camera integrated, Clove, Height adjustable picker, Nutmeg