

## Design, development and evaluation of a manually operated onion grader for Rose onion

■ G. GAYATHRI, K.V. HARSHANJALI, K. RUPAVATHI, D. VIJAY KUMAR, G. SENTHIL KUMARAN, A. CAROLIN RATHINA KUMARI AND M.V. RAMANA

Received : 01.04.2016; Revised : 15.08.2016; Accepted : 01.09.2016

See end of the Paper for authors' affiliation

Correspondence to :

**G. GAYATHRI**

College of Agricultural Engineering (ANGRU) Madakasira, ANANTAPUR (A.P.) INDIA

Email : [gorlagayathri004@gmail.com](mailto:gorlagayathri004@gmail.com)

■ **ABSTRACT** : A manually operated onion grader was designed, developed and evaluated at I.I.H.R., Bangalore for Rose onion varieties commonly cultivated in Bangalore into three grades based on geometric dimensions of the selected variety. The linear dimensions like polar diameter, equatorial diameter and thickness of Rose onions were found in the range of 21.92 - 54.54 mm, 15.83 - 59.13 mm and 16.52 - 50.22 mm, respectively. The angle of repose of Rose onions were found as 54.5°, and co-efficient of static friction for onions on different surfaces like galvanized iron 0.402, for stainless steel 0.414, for aluminum 0.386, for mild steel 0.522 and for plywood 0.366, respectively. Experiments were conducted with three types of slopes, at each slope three different feed gate opening lengths and two swing directions. The statistical analysis showed that the standardized parameters were slope 4°, length wise swing direction and feed gate at full opening. The grader has a grading capacity 1105 kg/h at overall grading efficiency 75 per cent and required grading efficiency 75 per cent. The operation cost of machine was 6 times less than manual operation cost.

■ **KEY WORDS** : Rose onions, Grading, Grading efficiency, Grading capacity, Damage efficiency

■ **HOW TO CITE THIS PAPER** : Gayathri, G., Harshanjali, K.V., Rupavathi, K., Kumar, D. Vijay, Kumaran, G. Senthil, Kumari, A. Carolin Rathina and Ramana, M.V. (2016). Design, development and evaluation of a manually operated onion grader for Rose onion. *Internat. J. Agric. Engg.*, 9(2) : 121-129, DOI: 10.15740/HAS/IJAE/9.2/121-129.