

## **Development and evaluation of dried black pepper de stoning Machine**

*R.M.G.V.Rathnayake<sup>1</sup>, T.M.R. Dissanayake<sup>2</sup>, and G.V.T.V. Weerasooriya<sup>1</sup>*

- 1. Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka.*
- 2. Institute of Post Harvest Technology (IPHT), Jayanthi Mawatha, Anuradhapura, Sri Lanka.*

Pepper (*Piper nigrum* L.) is an important commercial spice since early times in Sri Lanka and is widely used spice in the world. Producing of good quality pepper is one of the requirements in the country due to the increase of the export potential of pepper. A major problem faced by the pepper exporting industry in Sri Lanka is high percentage of inert matter contamination especially sand and stones. De stoner is used for the removal of heavy foreign contaminants like stones, from grains and seeds of all crops. It works on the principle of gravity separations with stratification by positive pressure fan.

A study was conducted to test and evaluate suitability of rice destoning machine currently used in rice milling industry in Sri Lanka for dried pepper destoning. Firstly, the existing rice destoning machine was modified to change the deck angle and to control the motor speed. The machine was evaluated for its performance with a view to recommending for the Sri Lankan spice processing industry. The performances were evaluated in terms of capacity, power consumption, percentage of breakage berry, percentage of stone removed and cost of production. In this study, air flow, inclination of deck and thrust to deck (speed of motor) was changed with suitable combinations for selecting the proper adjustments.

The rice de-stoning machine performed best as a de-stoner for dried pepper after changing only the deck inclination by 7 degrees. The rice de-stoner is given a capacity of 355.5 kg/hr. The power consumption per kilogram of dried pepper is  $82.8 \times 10^{-3}$  kWh. The percentage of breakage berry and the percentage of stone removed are 0.5 and 99.99 percent respectively. The cost of production per kilogram of dried pepper by this machine is LKR 0.64. Maximum machine efficiency and high quality black pepper can be achieved by one pass time. Further, it is suggested this would be suitable for commercial level.

