

Development and evaluation of a threshing machine for *Prosopis africana* seed

Abstract

A decortivating machine for *Prosopis Africana* was developed, tested and evaluated. *Prosopis Africana* is popular in the Sub-Saharan Africa, with all the parts of the tree useful for medicinal purposes. This study focuses on the threshing of the pod to obtain the seed, which is the most widely used of the parts of the *Prosopis Africana* tree. Results from preliminary investigations carried out on some physical and engineering properties of the pod and seed were used in the design of a threshing machine. The machine was tested with pods at a moisture content of 8% w.b. using speeds of 300, 350, 400 and 450rpm at four feed rates of 1, 2, 3 and 4kg/min. The threshing efficiency (TE), cleaning efficiency (CE) and seed loss (SL) increased as the drum speed increased. There was however no significant difference in the variations of the values of TE, CE and SL at different feed rates but the TE and CE decreased with increase in feed rate. The maximum threshing and cleaning efficiencies were obtained at a speed of 450 rpm as 95.8% and 96.0% respectively at a feed rate of 1 and 4 Kg/min. The highest seed loss (19.1%) was obtained at a drum speed of 450rpm and feed rate of 4Kg/min. The high threshing and cleaning efficiencies obtained in the threshing of *Prosopis Africana* and minimal loss have shown that there is a prospect in the mechanization of the processing and handling operation hence commercialization and promotion of mechanized threshing at a large scale.