Title Testing of the Improved Betel Nut Shelling Machine

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Abstract

This research presents a performance testing of the improved prototype of betel nut shelling machine. Experiment design was a factorial in CRD which featured 3 control factors: rotating tire speed (4 levels: 333, 382 ,448 and 508 rpm); tire pressure (3 levels : <10, 10 and 20 psi);sieve clearance (3 levels 10, 15, 20 mm). Dry betel nut of 8.1% wb moisture and of medium size (15.1-20.0 gm/fruit) was used as a testing sample. Three replications were for each combination of the control factors, with 60 nuts per replication. Performance variables of concern were percentage of full nut, broken nut, unshelled nut and shelling capacity. Results showed that the appropriate condition for design and operation of the machine was the rotating tire speed of 448 rpm, tire pressure of 20 psi and 20 mm clearance between sieve and tire. The associated performance was 85.67% of full nut, 13.00% of broken nut, 4.3% of black-stained nut and 1.33% of unshelled nut, with a shelling fruit capacity of 109.7 kg/h.