

**Title** Development and testing of a husking machine for dry betel nut (*Areca Catechu Linn.*)  
**Author** Bundit Jarimopas, Suttiporn Niamhom and Anupun Terdwongworakul  
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### **Abstract**

A prototype betel nut husking machine was designed, constructed, tested and evaluated. The design concept was to tear-off the husk of the dry betel nut by exerting differing dynamic friction forces on opposite sides of the nut *via* normal pressure. The prototype featured a hopper into which dry betel nuts were fed, a husking mechanism, and a power drive. The husking mechanism was composed of two identical husking wheels mounted in series. Each husking wheel consisted of a rubber tyre and a concave sieve constructed from steel rods. The dry betel nut was fed into the space between the running tyre surface and the sieve surface of the husking mechanism. When the nut passed through the first wheel, the combined compression and friction force crushed the nut husk and loosened the nut. The husk and nut were further separated by repeating the operation with a second tyre. Results showed that (a) the optimum machine settings, identified by the greatest production score (PS), were characterised by a tyre pressure of 138 kPa, a tyre speed of 440 rpm, and a 15 mm spacing between the surfaces of the tyre and the sieve; (b) the optimal betel nut fruit moisture content was 6.31% w.b. Performance testing of the prototype based on the optimum settings produced the following results: optimally husked full nuts (64.4%); broken nuts (15.2%); unhusked nuts (20.5%). Thus, the PS was 76.9%.