

## REKAYASA MESIN PENCETAK BUTIR BERAS SIMULASI DARI MATERI TANAMAN HUTAN (*Simulated Rice Grain (SRG) Forming Machine Made From Forest Intercropping Plant Flour as Raw Material*)

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### ABSTRACT

*Indonesia is rich of non-rice carbohydrate source including forest intercropping plants. Simulated Rice Grain (SRG) was made from non-rice carbohydrate sources which had close characteristic to the physicochemical properties of flour and Ciherang grain variety. This paper studies the machine design of Stimulated Rice Grain (SRG) made of non-rice carbohydrate from forest intercropping plant. SRG forming machine design is approached through the design criteria, design analysis, functional design and manufacturing processes, while SRG forming machine was tested using mixed material made from 30% of arrowroot starch, 42% of beneng taro flour and 28% of sorghum. The specification of SRG forming machine is 6.8 x 2.2 x 5.06 mm for die space dimension, 1.9–2.3 for pressure ratio, 600 N for pressure force, 70° for angle of repose, 0–5000 microseconds for space time length, capacity of 900 grain per hour and 25-80 °C for die space temperature regulator. It resulted SRG with length of 7.1 mm, thickness of 2.8 mm, slightly rounded shape, grain firmness of 0.1-2 N, rice grain density of 620-770 kg/m<sup>3</sup> and grain weight of weight grain 17.5-29 g per 1000 grains.*

*Keywords: Non-rice carbohydrate source, simulated rice grain, SRG forming machine, design*

### ABSTRAK

Indonesia kaya akan aneka sumber karbohidrat non-beras, termasuk di dalamnya tumpang sari tanaman hutan. Bulir beras simulasi (*Simulated Rice Grain/SRG*) dibuat dari bahan tepung aneka sumber karbohidrat non-beras dengan pendekatan sifat fisiko kimia tepung dan bulir beras varietas Ciherang. Tulisan ini mempelajari rancang bangun mesin pencetak SRG berbahan baku campuran tepung hasil tumpang sari tanaman hutan. Perancangan mesin pencetak SRG didekati melalui kriteria perancangan, analisa desain, desain fungsional dan proses manufaktur, mesin ini diuji coba dengan menggunakan bahan campuran terbuat 30% pati garut, 42 % tepung tales beneng dan 28% tepung sorgum. Hasil rekayasa mesin pencetak SRG mempunyai dimensi ruang pencetak 6,8 x 2,2 x 5,06 mm , rasio pemampatan 1,9-2,3, kekuatan tekan 600 N. Sudut luncur pengumpan 70°, lama tekan pencetakan 0-5000 mikrodetik, kapasitas 900 bulir per jam dan temperatur bantalan ruang cetak 25-80 °C. Pengujian mesin pencetak menghasilkan bulir SRG dengan panjang 7,1 mm, tebal 2,8 mm, bentuk agak bulat, kekerasan bulir 0,1–2 N, massa jenis SRG 620-770 kg/m<sup>3</sup> dan bobot 17,5-29 g per 1000 butir.

Kata kunci : Aneka sumber karbohidrat non-beras, bulir beras simulasi, mesin pencetak SRG, desain