

# KAJIAN DASAR MESIN PEMINDAH HASIL PERTANIAN BIJIAN DENGAN MENGGUNAKAN HEMBUSAN UDARA

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## INTISARI

Penelitian ini bertujuan untuk mendapatkan persamaan matematik yang dapat digunakan dalam perancangan mesin pemindah hasil pertanian bijian dengan menggunakan hembusan udara. Kebutuhan mendesak akan peralatan pemindah hasil pertanian bijian telah membawa penelitian mengenai pemindahan bahan pertanian bijian terhadap tiga jenis bahan pertanian; kedelai, jagung, dan kacang tanah dengan densitas masing-masing; kedelai 1.2021 gr/ cm<sup>3</sup>, jagung 1.2259 gr/ cm<sup>3</sup>, dan kacang tanah 1.0507 gr/ cm<sup>3</sup>.

Ketiga jenis bahan, panjang antara 0.691 – 1.360 cm, diumpankan dalam aliran udara dari blower melalui pipa dengan diameter 3 inchi panjang pipa adalah 200, 400 and 600 cm dan kecepatan dari aliran udara adalah 1990, 3110 and 3600 cm/dt. Tinggi angkat dari bahan bijian dicatat. Data dianalisa dengan menggunakan metode analisa dimensi. Hasil perhitungan didapatkan persamaan matematis:

$$\frac{S}{R_1} = 1.995 \times 10^{-30} \times \left[ \frac{\rho_b}{\rho_u} \right]^{7.79} \left[ \frac{P_b}{R_1} \right]^{1.19} \left[ \frac{V_u \rho_u R_1}{\mu_u} \right]^{1.54} \left[ \frac{R_2}{R_1} \right]^{-0.280}$$

Kata kunci : tinggi angkat, bahan pertanian bijian, analisa dimensi.

**AGRICULTURAL GRAINS PRODUCTS' CONVEYING MACHINERY**

**USING AIR FLOW**

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**ABSTRACT**

This research's objective was to find mathematical equation that can be used in the design of agricultural grains products' conveying machinery. The urgent need of improving agricultural conveying machinery has led the research of conveying three agricultural grain products; i.e., soybean, corn and ground nut.

The grains (the density were 1.2021 gr/ cm<sup>3</sup> for soybean, 1.2259 gr/ cm<sup>3</sup> for corn, and 1.0507 gr/ cm<sup>3</sup> for ground nut) were fed into the moving air flow from a blower through a pipe of three inches in diameter; the length of the pipe were 200, 400 and 600 cm and the velocity of the air flow were 1990, 3110 and 3600 cm/ sec. The lifting height of the grains was recorded. The data were analyzed using the dimensional analysis method. The result is mathematical equation:

$$\frac{S}{R_1} = 1.995 \times 10^{-30} \times \left[ \frac{\rho_b}{\rho_u} \right]^{7.79} \left[ \frac{P_b}{R_1} \right]^{1.19} \left[ \frac{V_u \rho_u R_1}{\mu_u} \right]^{1.54} \left[ \frac{R_2}{R_1} \right]^{-0.280}$$

Key words : lifting height, agricultural grain products,  
dimensional analysis.