

INTISARI

ANALISIS MATEMATIS PENGARUH JENIS BIJI DAN KADAR AIR TERHADAP KARAKTERISTIK SIFAT FISIK DAN MEKANIS KOPI (*Coffea sp.*)

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Pengukuran terhadap sifat fisik dan mekanik bijian sebagai produk pertanian penting dalam mendesain alat dan mesin untuk proses pemanenan, penanganan, hingga proses pengolahan. Tujuan dari penelitian ini yaitu menganalisis secara statistik pengaruh variasi jenis biji kopi dan kadar air terhadap parameter sifat fisik dan mekanis biji kopi serta menetapkan hubungan matematis dari sifat-sifat tersebut terhadap kadar airnya. Pengujian dilakukan menggunakan tiga jenis biji kopi yaitu robusta, arabika, dan liberika dengan kandungan kadar air 9 – 19 % basis basah (wb). Beberapa parameter sifat fisik yang diukur meliputi dimensi, *mean geometric diameter*, *sphericity*, berat 1000 butir, warna, kekerasan, *bulk density*, *particle density*, dan porosity, sedangkan parameter sifat mekanis yang diuji, yaitu *terminal velocity*, *angle of internal friction*, dan *angle of wall friction*. Hasil penelitian ini didapatkan bahwa perbedaan jenis biji secara signifikan mempengaruhi nilai dimensi, *sphericity*, *geometric mean diameter*, berat seribu butir, *lightness*, *chroma*, *hue angle*, *particle density*, *bulk density*, *porosity*, kekerasan, *terminal velocity*, *angle of internal friction* dan *angle of wall friction*. Perbedaan tingkat kadar air secara signifikan mempengaruhi nilai dimensi, *sphericity*, *geometric mean diameter*, berat seribu butir, *lightness*, *hue angle*, *particle density*, *bulk density*, *porosity*, *terminal velocity*, kekerasan *angle of internal friction* dan *angle of wall friction*. Terdapat interaksi antara jenis kopi dengan kadar air terhadap nilai dimensi, *sphericity*, *geometric mean diameter*, berat seribu butir, *lightness*, *chroma*, *hue angle*, *particle density*, *bulk density*, *porosity uncompacted*, kekerasan, *terminal velocity*, dan *angle of internal friction*.

Kata kunci : jenis kopi, kadar air, sifat fisik, sifat mekanis

ABSTRACT

MATHEMATICAL ANALYSIS OF THE EFFECT OF BEAN TYPES AND MOISTURE CONTENT ON PHYSICAL AND MECHANICAL PROPERTIES OF COFFEE (*Coffea sp.*)

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Measuring physical and mechanical properties of beans as agricultural products is important to design equipments and machines for the process of harvesting, handling, and processing. The objective of this research is to analyse statistically the influence of coffee beans variants and the moisture content towards the parameters of the physical and mechanical properties of coffee beans and applying the mathematical relation in the three type of coffee beans which are robusta, arabika, and liberika which have the moisture content in the range of 9-19% of wet basis. The parameters of physical characteristics that are measured are including the dimension, *mean geometric diameter*, *sphericity*, weight of one thousand amount, colour, *hardness*, *bulk density*, *particle density*, and *porosity*. The parameters of mechanical characteristics that are examined include the *terminal velocity*, *angle of internal friction* and *angle of wall friction*. The result of this experiment shows that different type of beans significantly affects the dimension, *sphericity*, *geometric mean diameter*, weight of one thousand amount, *lightness*, *chroma*, *hue angle*, *particle density*, *bulk density*, *porosity*, *terminal velocity*, *hardness*, *angle of internal friction* and *angle of wall friction*. The different of moisture content significantly affects the dimension, *sphericity*, *geometric mean diameter*, weight of one thousand amount, *lightness*, *hue angle*, *particle density*, *bulk density*, *porosity*, *terminal velocity*, *hardness*, *angle of internal friction* and *angle of wall friction*. There is interaction between types of coffee with moisture content toward the dimension, *sphericity*, *geometric mean diameter*, weight of one thousand amount, *lightness*, *chroma*, *hue angle*, *particle density*, *bulk density*, *porosity uncompact*, *terminal velocity*, *hardness*, and *angle of internal friction*.

Keyword : variety coffee's, moisture content, physical properties, mechanical properties.