

## RINGKASAN

Jeruk lemon adalah buah yang mempunyai aroma yang kuat serta bermutu tinggi. Hubungan mutu jeruk lemon terhadap lokasi pertumbuhan sangatlah penting, karena lokasi tumbuh meliputi ketinggian, suhu cuaca, tekanan udara, dan jenis tanah dapat mempengaruhi rasa, ukuran, dan kualitas buah tersebut. Pengetahuan terkait sifat fisik dan mekanik adalah suatu pemahaman untuk dapat menganalisis karakteristik suatu buah. Sampai saat ini belum ada informasi mengenai sifat fisik dan mekanik jeruk lemon di Kabupaten Banyumas, Kebumen, dan Purbalingga, sehingga mengakibatkan kendala dalam pengembangan metode pascapanen. Oleh karena itu, tujuan penelitian ini yaitu (1) mengetahui sifat fisik dan mekanik jeruk lemon sesuai lokasi pertumbuhan dan (2) menentukan kesesuaian lahan untuk budidaya jeruk lemon berdasarkan sifat fisik dan mekanik.

Penelitian dilaksanakan di Laboratorium Teknik Pengolahan Pangan dan Hasil Pertanian (TPPHP), Fakultas Pertanian, Universitas Jenderal Soedirman pada November 2023-Juli 2024. Variabel yang diukur dalam penelitian ini yaitu sifat fisik meliputi: massa jeruk lemon, kadar air, volume, densitas, *spherisitas*, *roundness*, dan sifat mekanik yaitu kekerasan jeruk lemon. Alat yang digunakan antara lain yaitu alat tulis, timbangan analitik, pisau, loyang, nampan, cawan, penggaris, kertas milimeter blok, jangka, kamera digital, *fruit hardness tester*, oven, gunting *pruning*, dan aplikasi altimeter. Bahan yang digunakan yaitu jeruk lemon California sejumlah 15 buah dari setiap lokasi yang diambil dari Kabupaten Banyumas (Kalibagor<sub>1</sub> dan Kalibagor<sub>2</sub>), Kebumen (Klirong), dan Purbalingga (Kaligondang<sub>1</sub> dan Kaligondang<sub>2</sub>). Data yang diperoleh dianalisis dengan metode deskriptif, yang dimana metode ini digunakan untuk menganalisis data dengan cara mendeskripsikan data yang telah diperoleh.

Hasil penelitian menunjukkan bahwa dari hasil penelitian sifat fisik dan mekanik jeruk lemon menunjukkan bahwa nilai rata-rata parameter massa dan volume tertinggi terletak di daerah Kaligondang<sub>1</sub> dengan rata-rata 105,46 g dan 99,53 cm<sup>3</sup>. Nilai rata-rata parameter kadar air tertinggi sebesar 5,62% terletak di daerah Kalibagor<sub>1</sub>. Nilai rata-rata parameter densitas tertinggi sebesar 1,15 g/cm<sup>3</sup> terletak di daerah Kaligondang<sub>2</sub>. Nilai rata-rata parameter *spherisitas* dan *roundness* tertinggi sebesar 0,906 cm dan 0,82 cm terletak di daerah Kalibagor<sub>2</sub>. Nilai rata-rata parameter kekerasan terendah sebesar 9,88 kg/cm<sup>2</sup> terletak di daerah Kalibagor<sub>2</sub>. Dari data sifat fisik dan mekanik yang telah diperoleh, untuk lokasi lahan yang potensial dijadikan budidaya jeruk lemon berdasarkan sifat fisik yaitu, di daerah Kaligondang<sub>1</sub> dengan massa tertinggi sebesar 105,46 g merujuk pada SNI jeruk (SNI 01-3165-1992) yang dilihat parameter massa jeruknya. Sedangkan untuk sifat mekanik, lokasi potensial budidaya jeruk lemon yaitu di daerah Kalibagor<sub>2</sub> dengan nilai kekerasan sebesar 9,88 kg/cm<sup>2</sup>.

## SUMMARY

*Lemon is a fruit with a strong aroma and high quality. The relationship between the quality of lemons and the growth location is very important, as the growth location, which includes altitude, weather temperature, air pressure, and soil type, can affect the taste, size, and quality of the fruit. Knowledge of the physical and mechanical properties is an understanding needed to analyze the characteristics of a fruit. Until now, there has been no information regarding the physical and mechanical properties of lemons in Banyumas, Kebumen, and Purbalingga Regencies, resulting in challenges in the development of post-harvest methods. Therefore, the objectives of this research are (1) to determine the physical and mechanical properties of lemons according to the growth location and (2) to determine the suitability of land for lemon cultivation based on physical and mechanical properties.*

*The research was conducted at the Food and Agricultural Products Processing Engineering (TPPHP) Laboratory, Faculty of Agriculture, Jenderal Soedirman University, from November 2023 to July 2024. The variables measured in this study include physical properties such as lemon mass, moisture content, volume, density, sphericity, roundness, and mechanical properties such as lemon hardness. The tools used include writing instruments, an analytical balance, a knife, a baking tray, a tray, a dish, a ruler, graph paper, calipers, a digital camera, a fruit hardness tester, an oven, pruning shears, and an altimeter application. The materials used were 15 California lemons from each location taken from Banyumas Regency (Kalibagor<sub>1</sub> and Kalibagor<sub>2</sub>), Kebumen (Klirong), and Purbalingga (Kaligondang<sub>1</sub> and Kaligondang<sub>2</sub>). The data obtained were analyzed using a descriptive method, which is used to analyze data by describing the data that has been collected.*

*The research results showed that the physical and mechanical properties of lemon indicated that the highest average values for mass and volume parameters were found in the Kaligondang<sub>1</sub> area, with averages of 105.46 g and 99.53 cm<sup>3</sup>, respectively. The highest average moisture content was found in the Kalibagor<sub>1</sub> area at 5.62%. The highest average density was 1.15 g/cm<sup>3</sup>, located in the Kaligondang<sub>2</sub> area. The highest average values for sphericity and roundness were 0.906 cm and 0.82 cm, respectively, in the Kalibagor<sub>2</sub> area. The lowest average hardness was 9,88kg/cm<sup>2</sup>, found in the Kalibagor<sub>2</sub> area. Based on the physical and mechanical properties data obtained, the most suitable location for lemon cultivation, based on physical properties, is the Kaligondang<sub>1</sub> area, with the highest mass of 105.46 g, referring to the Indonesian National Standard for citrus (SNI 01-3165-1992), which considers the mass parameter. As for mechanical properties, the potential cultivation location is in the Kalibagor<sub>2</sub> area, with a hardness value of 9.88 kg/cm<sup>2</sup>.*