Analisis pengaruh lapisan lilin pada model prediksi kekerasan apel malang (malus sylvestris mill) berbasis citra Visible and Near-Infrared (VNIR) = Analysis of the effect of wax coating on firmness prediction model of malang apples (malus sylvestris mill) based on Visible and Near-Infrared (VNIR) image

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Abstrak

ABSTRAK
Pada saat ini, buah-buahan dilapiskan lilin untuk mempertahankan kualitas dan memperpanjang usia simpan buah. Pengukuran kualitas buah yang dilapiskan lilin umumnya bersifat destruktif. Pengukuran kualitas buah berlapis lilin menggunakan citra VNIR belum pernah dilakukan, sehingga diperlukan pengkajian lebih lanjut mengenai pengaruh lapisan lilin pada pengukuran kualitas buah berbasis citra VNIR. Dalam penelitian ini, lilin lebah digunakan untuk melapiskan apel malang. Partial Least Square Regression (PLSR) dan Regression Tree (RT) digunakan sebagai algoritma seleksi fitur dan model regresi. Dalam penelitian ini, pemodelan dibentuk menggunakan apel tidak berlapis lilin, apel berlapis lilin, gabungan antara apel tidak berlapis lilin dan apel berlapis lilin. Selanjutnya, dilakukan pengujian apel malang berlapiskan lilin terhadap model prediksi kekerasan apel malang tidak berlapiskan lilin. Sistem prediksi kekerasan memiliki performa terbaik jika menggunakan data pelatihan dan data pengujian berupa apel tidak berlapis lilin saja. Hasil dari model PLSR dan RT menggunakan apel tidak berlapis lilin sebesar 0,97 dan 0,88 pada R2; 3,22 dan 6,65 pada RMSE. Berdasarkan hasil tersebut, lapisan lilin pada permukaan buah dapat memengaruhi hasil pengukuran berbasis citra VNIR.
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ABSTRACT
These days, wax coating was applied on fruits to maintain its quality and extends the shelf life. The quality measurement of the waxed fruit was destructive in most cases. The quality measurement of the waxed fruit with VNIR image had never been done before, so further study about the effect of wax coating for VNIR image-based fruit quality measurement was needed. In this study, beeswax is used to coated Malang apples. Partial Least Square Regression (PLSR) and Regression Tree (RT) used as feature selection and regression model algorithm. In this study, a regression model was built using non-waxed Malang apples, waxed Malang apples, a combination of non-waxed Malang apples and waxed Malang apples. Next, the waxed Malang apples was tested to the firmness prediction model of the non-waxed Malang apples. Firmness prediction system of Malang apples obtained the best performance if using training data and test data of non-waxed Malang apples. The results of PLSR and RT model using non-waxed Malang apples were 0.97 and 0.88 for R2, 3.22 and 6.55 for RMSE. Based on these results, wax coating on the surface of the fruit could disrupt the measurement results of VNIR image.