

## 키넥트를 이용한 배추 생체중 추정

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## Evaluation of the Kinect Sensor to Estimate Fresh Weight of Cabbages

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Measurement of biomass is needed for development and validation of crop models to predict the yield of a crop. Considerable costs and labors are often used to measure crop biomass from a large number of samples, which is performed with destructive methods. The Kinect sensor, which is a depth sensor for measurements between an object and the sensor, can be used to estimate the fresh weight of a crop. This non-destructive approach could reduce the need for a lot of efforts. The objective of this study was to assess the feasibility of the Kinect sensor to obtain estimates of cabbage fresh weight. The biomass of five cabbages was measured manually. These measurements were compared with estimates obtained from the Kinect sensor. The Kinect sensor was used to scan individual cabbages, create point cloud, remove noise, and build a model for volume estimates. It was found that the Kinect sensor resulted in three dimensional models of cabbage that explained about 98.7% of variation in cabbage fresh weights. Furthermore, the r value between estimates and measurements was highly significant. This indicated that the Kinect sensor would be useful to estimate biomass for a cabbage. Our results suggested that a depth sensor such as the Kinect sensor would enable to obtain a non-destructive sampling for biomass, which allows to collect time series of biomass observation data for a crop.

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