

Title Early prediction of ripening and storage quality of pear fruit in South Africa
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Abstract

Maturity index records for the principal pear cultivars in the two most important pear producing areas in South Africa were compiled to study the fluctuation in total soluble solids (TSS), fruit firmness and starch breakdown during consecutive seasons. Temperatures (heat units, hu), sunlight hours (ssh), fruit size (diameter), days after bloom (dafb) and soil type were used to calculate the rate of change in TSS levels, firmness and starch breakdown during the last five to six weeks before the picking date. These variables were shown to have an effect on the internal fruit quality. High temperatures were found to result in a faster drop in firmness levels and increased sunlight hours improved the TSS levels. Orchards on sandy soils showed consistently lower TSS levels and firmness when different orchards were compared during consecutive seasons. Equations were fitted to the data for each cultivar and area to develop models for the prediction of the different indices. The predicted rates of change of the different indices were compared with the actual values to test the accuracy and proved to explain more than 80% of the variation during consecutive seasons. The results also showed that the rate of change for these indices could be estimated as early as the middle of December. These models are considered important tools to assist growers, pack houses and marketers in identifying seasons when fruit will have a short shelf life. Picking dates, cold storage and marketing can be adapted to ensure the best possible fruit quality.