Abstract

Tomato batches are characterised by large variation in the quality attributes colour and firmness. Acceptability of tomato batches is consequently affected by the colour maturity and firmness maturity. In this paper, a model for the acceptance period (AP) is presented that describes the acceptability of tomato batches as the time that all quality attributes are considered acceptable as a function of the maturity at harvest. This model takes into account that tomatoes can first be unacceptable due to being over-ripe, then be acceptable, and then be unacceptable again, due to being over-ripe. Furthermore, the AP model takes also into account that consumers may not consume all tomatoes in a truss at the same time, some immediately and some in 3–4 days time. This is accomplished by combining the acceptance period for future and immediate consumption and taking the intersection of those two as the overall AP to indicate whether tomato batches are suited for both types of consumption. The AP model combines the effects of biological variation, varying consumer limits and the variation in the time of consumption into a practical method to assess acceptability of tomato batches at harvest.

The AP model was based on three experiments. In the first and second experiment several tomato batches, differing in harvest maturity, were harvested and stored at three different temperatures. Colour and firmness was measured non-destructively and repeatedly over time so as to estimate the colour and firmness maturity at harvest for each batch. The third experiment was used to determine the consumer limits for today's consumption and consumption over the weekend. By combining the results from all experiments it was possible to estimate the AP as a function of the maturity at harvest, storage temperature and storage duration.

The AP model might be used as a tool for growers to assess the acceptability of tomato batches periodically to analyse and solve quality issues or by optimising the compliance to consumer acceptance by varying the storage temperature and transport time to the retailers. Both applications may help to increase profitability in terms of repeated purchase by consumers.