

Title Spatial and temporal variability of yield and fruit quality in apples
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Citation Abstracts Book, 6th International Postharvest symposium, 8-12 April 2009, Antalya, Turkey.
256 pages.
Keyword Variability; yield; apple

Abstract

The objective of this work was to study the spatial and temporal variability of yield and fruit quality in an apple orchard for three consecutive years. The orchard was located in Ptolemaida area, northern Greece and two cvs were studied, Red Chief and Fuji. For yield mapping, fruit production per five trees was weighed and geographical position in the middle of the five trees was recorded using a palm-top computer with GPS. Fruit samples were randomly selected from each yield measuring point and fruit quality was measured immediately and after 4 months cold storage at 0°C. Fruit quality included fruit mass, skin color, flesh firmness and juice soluble solids content, pH and acidity. Yield and quality characteristics maps were generated using Surfer software. Significant spatial variability in yield and quality were found. Spatial variability for quality was lower than the one for yield. Fruit soluble solids content and flesh firmness showed low and fruit mass, acidity and skin color showed high spatial variability. Temporal variability (differences from year to year) in yield was low in Red Chief and high in Fuji trees due to alternate bearing. Temporal variability was significant for quality characteristics, probably due to differences in weather conditions from year to year. During cold storage, flesh firmness and acidity decreased and soluble solids content increased Red Chief or did not change in Fuji fruit.