Novel analytical tools and data analysis methodologies can play an important role in order to promote and preserve fruit quality. Non-invasive and/or rapid methods allow increased sampling, online produce quality monitoring and process follow-up during the entire production and supply chain. At the Research Station Agroscope Changins-Wädenswil ACW, several spectroscopic methods (VIS, IR, NIR, NMR) have been examined for the non-destructive measure of pre- and post-harvest quality parameters in fresh fruit and vegetables. Near-infrared spectroscopy appears to be one of the most promising approaches. Classical quality parameters, such as texture, soluble solid content and titrable acidity, can successfully be assessed through a rapid and non-invasive NIR measurement. Nevertheless, aroma, probably one of the most important quality attributes for the consumer, cannot be effectively assessed by this method. A new generation of “electronic noses”, that couple directly headspace sampling with mass-spectrometry (MS) detection, may enable the rapid characterisation (fingerprint) and the follow-up of fruit aroma. In this study, 3 different NIR devices (NIR Case of SACMI/IT, DA-Meter of Sintéleia/IT, Phazir of AnalytiCON/DE) as well as a MS-based electronic nose (SMartNose®, SMart Nose SA/CH) were evaluated for the rapid and/or non-destructive measure of quality parameters along the production and supply chain: - The pre-harvest quality (ripening monitoring) of pomaceous and stone fruits was followed up by NIR portable instruments; - Changes in fruit quality during storage (post-harvest quality) were monitored by NIR and electronic nose; - NIR and electronic nose measurements were carried out to support the sensory analysis of apples after storage (sensory quality). Although these analytical approaches have been proven very promising, further research and thorough method validation are still needed before their implementation can represent a tangible advantage for producers and consumers.