Title Storability and fruit quality of organically grown topaz apples as affected by harvest date and different storage conditions

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Abstract

Organic fruit production in Austria has increased rapidly in recent years. 'Topaz' is the main organically grown apple cultivar both fresh market and processing. Topaz, a scab resistant apple cultivars of Czech origin, was introduced in 1998 and is actually ranked 7th in the Austrian apple production (212 ha). One of the direct consequences of this rapid growth is an increase in the amount of fruits and thus the length of storage time. In· comparison with other varieties 'Topaz' is very susceptible to physiological disorders and lenticel spot diseases (Gloeosporium rot) during long term storage. In general, organic grown apples are not treated with chemical fungicides to prevent fungal decay and these fruits may suffer up to 30 - 50 % decay during storage. The aims of this investigations on organically grown Topaz apples were to prevent physiological disorders and fungal decay and to reduce quality losses during storage and shelf-life by defining the optimal harvest date in combination with the new dynamic controlled atmosphere (DCA) storage technology. Fruits from 6 year-old 'Topaz' (*Malus domestica* cv. Topaz) trees on rootstock M 9 were harvested in 2006 and 2007 at three different stages of maturity (Optimal harvest date (OHD) – 1 week, OHD, OHD + 1 week) from the same transitional organic orchard in the experimental station of Haidegg. After harvest fruits of each stage of maturity (ca. 80 kg) were stored for approximately 8 months under different storage conditions (CA and DCA). Recommended CA conditions were used as a reference (1.5°C, O_2 1.5%, CO_2 3.0%) and DCA was based on the fruit's fluorescence response to low oxygen stress, O_2 was set at 0.3 - 0.4% plus 1.5% CO_2 in DCA. After storage and a 7 days shelf-life period at 20°C fruit quality was assessed automatically with the 'Pimprenelle' laboratory device. Browning disorders (cavities, flesh and brown core) and storage diseases were estimated visually. DCA storage maintained firmness and titratable acidity at higher levels compared to CA. DCA storage technology reduced browning disorders for more than 67% and Gloeosporium rot to 18% related to fruits stored only in CA. Neither low O_2 and nor external CO_2 injury was observed in DCA.