



Apricot (*Prunus armeniaca* L.) fruit quality attributes and phytochemicals under different crop load

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ABSTRACT

Three apricot (*Prunus armeniaca* L.) cultivars were subjected to different degrees of fruit thinning during pit hardening. At harvest fruit quality characteristics were assessed, along with phytochemicals' concentration, such as carbohydrates, phenolic compounds and organic acids. Antioxidant capacity of the pulp was estimated by diphenyl picryl hydrazyl and ferric reducing antioxidant power assays. Thinning improved fruit weight in two of the three cultivars with a subsequent decrease in fruit firmness, without significant effect on total soluble solid content and titratable acidity. The skin color was not influenced by thinning, but carbohydrate concentration and sweetness index increased. Total phenol concentration increased with thinning, without any similar increase of the major individual phenolic compounds detected (neo-chlorogenic acid, chlorogenic acid, rutin, catechin, epicatechin, ferulic acid, p-coumaric acid and caffeic acid). The antioxidant capacity of the pulp was not influenced by thinning. In overall, thinning enhanced the pomological traits of apricot fruits as well as their phytochemical content.

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1. Introduction

The apricot tree (*Prunus armeniaca* L.) is one of the most important fruit species grown in the world, as the fruit is highly appreciated by consumers. Consumers cherish the flavour and aroma of high quality apricots, with the sugar content being one of the most appreciable quality characteristics (Ruiz and Egea, 2008).

Under favourable conditions, apricots usually set abundant flowers. However, high fruit numbers lead to imbalance of fruit to leaf ratio and consequently to smaller, less desirable fruit, alternate bearing, limb breakage, pre-mature fruit drop, delayed fruit maturation and reduced fruit quality, exhaustion of reserves and reduced cold hardiness (Wünsche and Ferguson, 2005).

Fruit thinning is among the most important agricultural practices in fruit production systems (Meland, 2009). It is a widely applied practice in various fruits (e.g. apples, peaches, apricots) aiming in altering the sink/source relationship, by adjusting the number of fruits on the tree (based on fruit to leaf ratio), in order to attain adequate size for commercial sales (Rettke and Dahlenburg, 1999; Wünsche and Ferguson, 2005).

Numerous pomological traits determine apricot fruit quality, such as size, color, taste, aroma and firmness (Souty et al., 1991) as well as sugar and organic acid content and volatile compounds (Ruiz and Egea, 2008). Since the past decade, consumers are

strongly interested in attractive, tasty fruits, which not only do they cover the basic need for nutrient supply but also possess health promoting or disease preventing properties. Although much is known on the effect of thinning on fruit size and simple fruit quality characteristics, little is known on the effect on nutraceuticals' concentration. Apricot fruits contain significant levels of various phytochemicals such as vitamins, carotenoids and polyphenols, which contribute significantly to their taste, color and nutritive values. There is a considerable interest in polyphenols because of their antioxidant properties and ability to alleviate chronic diseases (Gardner et al., 2000; RiceEvans et al., 1997; Vinson et al., 1998). The major phenolic compounds in apricot are chlorogenic and neochlorogenic acids, (+)-catechin, (–)-epicatechin, and rutin (or quercetin-3-rutinoside), which have a positive and highly significant relationship with the antioxidant capacity of apricots (Dragovic-Uzelac et al., 2007).

The aim of the present manuscript was to study the effects of fruit thinning on apricot's common quality characteristics such as size, weight, color, soluble solids and titratable acidity as well as on antioxidant capacity and phytochemicals such as phenolic compounds, carbohydrates and organic acids.

2. Materials and methods

2.1. Plant material

The trial was conducted during the growing periods of 2009 and 2010. Full bearing apricot trees of cv. Bebecou, grown in

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