Berry are the most important antioxidant fruit, blueberries in particular have a high value of antioxidant activities (Scalzo et al, 2005). The phenolic compounds are able to protect organisms against oxidative stress induced by free radical species (Chao, Howard, Prior, & Clark, 2004). Anthocyanins are the most important group of water-soluble pigments in plants and also they are able to protect against disease (Hou, 2003). The European countries have significantly different growing conditions, climate and consumer requirements for berry cultivation. One of the most important objective of breeding is to find germplasm that has valuable characteristic combinations as a breeding resource for the production of improved berry cultivars or that is of direct interest for commercial use. In the last years, the extension of blueberry production is increasing really a lot because of a very high increase of consumer demand. The increased demand of blueberry cultivation areas is limited by the reduced adaptability of the most common varieties to different soils and climates. The availability of new varieties with an increased adaptability to different cultivation conditions is now an important need.

This study aims to identify the better varieties for the cultivation in the south part of Europe, starting from 13 blueberry cultivars and 6 selections of northern highbush, southern highbush and a Rabbiteye new Vaccinium southern bush selection, derived from the breeding program of The New Zealand Institute for Plant & Food Research Ltd, were also included. These genotypes were studied for the capacity to maintain better yield and fruit sensorial and nutritional quality in the south climates and chalky soils with high pH, amended with acid peat and specific fertigation programs.

The field was planted in 2010 and data reported are referred to 2012 and 2013 harvests. For each season were recorded data on total plant production, average fruit weight and fruit diameter. For fruit sensorial and nutritional quality were detected: soluble sugars (°Brix) and Titratable Acidity, Total antioxidant capacity (TAC: FRAP), total polyphenols (TPH) and anthocyanins (ACY) content.

**PLANT PRODUCTION AND FRUIT SIZE**

The highest fruit production per plant was detected for Reka (1608 g/plant), followed by the selection P&F075 (1160 g/plant), Patriot (981 g/plant) and Blue Ray (992 g/plant). Other genotypes showed the interesting production but these 4 for sure results as the more adapted to the soil and climatic conditions of our location. Important differences were also detected for the fruit size and weight. RH38 produced fruit with the highest weight (3 g) and diameter (20.6 mm), followed by Cosmopolitan (3.05 g and 18.0 mm) and Nui (2.95 g and 18.8 mm).

**FRUIT SENSORIAL AND NUTRITIONAL QUALITY**

Fruit of Bleu Silk, Bleu Crop and Hortbleupetit had highest values of SS and Titratable acidity, while Bleu Ray, Horbleupoppins and P&F075 to the highest values of soluble solids corresponded a lower value of titratable acidity, thus resulting with a more equilibrated sensorial quality. Fruit quality of Nui, Early Bleu and P&F158-10 was also interesting.

The new breeding selections P&F158-10 and P&F075 produced fruit with the highest values of TAC and the highest contents of total Polyphenols and Anthocyanins. These new genotypes can be considered really interesting for the potential health benefits to the consumer. Among the new varieties, fruit of Horbleupetit has the highest nutritional values (high TAC, TPH and ACY), followed by Nui, Bleu Silk, Duke and Bleu Crop. Interesting nutritional values were detected also for fruit of Early Bleu, Bleu Ray, Patriot, Reka and Roxy Bleu.

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