

'Bakirtzeika': A Greek Sweet Cherry Cultivar

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'Bakirtzeika' sweet cherry (*Prunus avium* L.) is a mid-late season, high-quality cultivar that matures 1 d earlier than 'Germersdorfer'. The trees require cross-pollination. Productivity and mean fruit weight of 'Bakirtzeika' were higher than 'Germersdorfer'. The fruit of 'Bakirtzeika' are large, symmetrical, and heart-shaped. Fruit of 'Bakirtzeika' are juicy, sour-sweet in taste when mature, and have good eating quality. The total soluble solids content of 'Bakirtzeika' was higher than 'Germersdorfer', whereas firmness was not different between the cultivars.

Origin

'Bakirtzeika' is a local Greek sweet cherry cultivar that was discovered as a chance seedling in 1986. The same year, the cultivar was included in an official trial and evaluated in the experimental orchard of the Greek Pomology Institute located in Naoussa (northern Greece, long. 22°12'0" E; lat. 40°29'04" N; elevation 225 m). The objective of this research was to provide information about the new Greek sweet cherry cultivar Bakirtzeika comparing it with the cultivar Germersdorfer that matures during the same period.

Description

The experimental trees were grafted on a wild cherry seedling rootstock (mazzard) (*Prunus avium* L.), trained in a typical vase form, and planted at a distance of 6 × 6 m apart. The soil at the experimental orchard at a depth of 0 to 80 cm was characterized as clay loam, slightly alkaline (pH 7.50), with low electrical conductivity (0.65 mS·cm⁻¹) and low organic matter (0.78%) and CaCO₃ (1.9%) content. Annual rainfall ranges from 600 to 800 mm. The mean maximum temperature of the experimental area is 38 °C in July, whereas the minimum temperature is -7 °C in January. Trees were irrigated by means of microsprinklers. Application of nutrients was based on leaf and soil analyses data. With

regard to foliar application of nutrients, boron was applied annually at the pre-bloom stage, zinc on newly developed leaves after bud-break, and calcium two to three times before harvest.

Trees of 'Bakirtzeika' are vigorous (more vigorous than 'Germersdorfer') with an upright growth habit. Flower buds are conical. The leaves are large, elliptical in shape, and have dentate margins. Blade length and width of 'Bakirtzeika' were larger than 'Germersdorfer' (Table 1). The nectaries are kidney-shaped and orange-red in color. Leaf fall of 'Bakirtzeika' and 'Germersdorfer' starts on 27 and 26 Nov., respectively (means based on 10 years' data). The flower density of 'Bakirtzeika' is high, similar to 'Germersdorfer'. Both cultivars have an average of three flowers per flowering bud. Flowering of cultivars Bakirtzeika and Germersdorfer starts on 9 and 11 Apr., respectively (means based on 10 years' data). The trees require cross-pollination. The S-locus genotype of 'Bakirtzeika' as determined by polymerase chain reaction is S₃S₄ (Ganopoulos et al., 2010), whereas that of 'Germersdorfer' is S₃S₁₂ (Bekefi, 2006). Regarding S-locus genotype incompatibility classification in sweet cherry, 'Bakirtzeika' belongs to Group III, whereas 'Germersdorfer' belongs to Group XXII (Bekefi, 2006).

Productivity data of 10 years reported are means of nine trees (three replications × three trees) per cultivar grafted on mazzard rootstock (means were based on data collected from when the trees were 5 years old to when they were 15 years of age) analyzed as a randomized complete block design. All other fruit characteristics reported were based on a random sample of 300 fruits selected from the experimental trees in each year. Leaf characteristics reported were based on a random sample of 100 leaves selected from each experimental tree in each year. The significance of the differences between means was evaluated using Fisher's *t* test analysis of variance at *P* < 0.05 carried out in SPSS Version 17 (SPSS Inc., Chicago, IL).

Fruit of 'Bakirtzeika' mature 1 d later than 'Germersdorfer', 5 June for 'Bakirtzeika' and 4 June for 'Germersdorfer' (means based on 10 years' data). Mature fruit of the two cultivars were evaluated immediately after harvest. Productivity of 'Bakirtzeika' was higher

than 'Germersdorfer' when grafted on mazzard rootstock, 100 and 80 kg/tree, respectively. The fruit of 'Bakirtzeika' are large, symmetrical, and heart-shaped (Fig. 1; Table 2) (Schmidt et al., 1985). Mean fruit weight of 'Bakirtzeika' was higher than 'Germersdorfer', whereas fruit length, width, and thickness were not different between the cultivars. Our results are in accordance with those of Albertini and Strada (2001) and Fajt et al. (2008) who reported that fruit weight of 'Germersdorfer' averaged 9.3 g. 'Bakirtzeika' fruit are attractive with a bright red color. L, a, and chroma color parameters were measured by a chromatometer (Minolta CR-200, Tokyo, Japan). L and a parameters of 'Germersdorfer' were higher than 'Bakirtzeika', whereas chroma was not different between cultivars. The pedicel length of 'Bakirtzeika' is ≈5.3 cm. Fruit of 'Bakirtzeika' are juicy with a sour-sweet taste when mature and have good eating quality. Total soluble solids content (measured with the Atago PR-1 electronic refractometer; Atago Co. Ltd., Tokyo, Japan) of 'Bakirtzeika' was higher than 'Germersdorfer' (Table 2). Our results are in accordance with those of Albertini and Strada (2001) and Fajt et al. (2008) who reported that total soluble solids of 'Germersdorfer' was 14% Brix. Firmness (measured with an Effegi penetrometer 6-mm tip; Effegi, Milan, Italy) was not different between the two cultivars. Stone shape of 'Bakirtzeika' is ovoid, whereas that of 'Germersdorfer' is oblong. Stone length, thickness, and width of 'Bakirtzeika' did not differ from

Table 1. Leaf characteristics of 'Germersdorfer' and 'Bakirtzeika'.

Cultivar	Germersdorfer	Bakirtzeika
Length of blade (cm)	12.20 b ²	15.20 a
Width of blade (cm)	5.68 b	6.69 a
Ratio of blade length/width	2.17 a	2.27 a
Length of petiole (cm)	5.18 a	5.36 a
Width of petiole (cm)	0.15 a	0.18 a
Number of nectaries per leaf	2.00 a	2.00 a

²Means followed by the same letter in the same row are not significantly different (Fisher's *F*; *P* < 0.05).

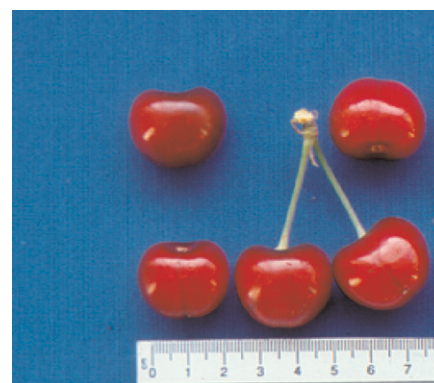


Fig. 1. Fruits of 'Bakirtzeika'.

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Table 2. Fruit characteristics of ‘Germersdorfer’ and ‘Bakirtzeika’.

Cultivar	Germersdorfer	Bakirtzeika
Fruit length (mm)	23.50 a ^z	22.90 a
Fruit width (mm)	26.50 a	28.10 a
Fruit thickness (mm)	22.20 a	23.60 a
Pedicle length (cm)	6.20 a	5.30 b
Fruit weight (g)	9.50 b	12.10 a
L	28.30 a	23.40 b
a	19.20 a	16.50 b
chroma	20.10 a	20.40 a
Fruit firmness (kg/cm ²)	0.62 a	0.64 a
Total soluble solids (% Brix)	14.90 b	18.50 a

^zMeans followed by the same letter in the same row are not significantly different (Fisher’s F; $P < 0.05$).

Table 3. Stone characteristics of ‘Germersdorfer’ and ‘Bakirtzeika’.

Cultivar	Germersdorfer	Bakirtzeika
Stone length (mm)	12.20 a ^z	10.70 a
Stone width (mm)	9.80 a	8.90 a
Stone thickness (mm)	7.30 a	7.00 a
Stone weight (g)	0.62 a	0.50 b
Ratio of stone/fruit weight	0.07 a	0.04 b

^zMeans followed by the same letter in the same row are not significantly different (Fisher’s F; $P < 0.05$).

‘Germersdorfer’, whereas stone weight and the ratio of stone/fruit weight were lower in ‘Bakirtzeika’ (Table 3). Macroscopical observations revealed that ‘Bakirtzeika’ showed the same susceptibility with ‘Germersdorfer’ to the main cherry tree diseases. Furthermore, in the soil-climatic conditions of the experimental orchard, both cultivars showed good resistance

to cracking induced by rainfall before harvest, which is of major importance for selecting a cultivar (Albertini and Strada, 1996).

In conclusion, ‘Bakirtzeika’ is a promising sweet cherry cultivar. Its ecological adaptation in all the areas in central and northern Greece where the trees were planted was very good.

Availability

‘Bakirtzeika’ sweet cherry was registered in the official list of cultivars of the Greek Ministry of Agriculture in 1991 and virus-free plants are presently available from the Greek Pomology Institute (R.R. Station 38, 59200, Naoussa, Greece). We have not yet applied for protection of this cultivar according to UPOV (International Union for the Protection of New Varieties of Plants) guidelines.

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