

‘Syrgiannidis’: An Early-maturing Pear

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‘Syrgiannidis’ is an early-maturing pear cultivar originating from a cross between the cultivars Santa Maria and Kontoula (Greek local cultivar). Fruits are pyriform in shape with maximum diameter of ≈ 48 mm, mean fruit length 54 mm, and mean fruit weight ≈ 131 g. The flesh is creamy white, juicy, fine in texture, flavorful, aromatic, and with very few stone cells (sclereids). The fruit flavor is sweet. The skin is green, blushed red with sun exposure, smooth, free of russeting, and has no tendency to become waxy in storage. Fruit matures on the tree in late June to early July. Two harvests are required under moderately cropped conditions. In Greece, regarding earliness, ‘Syrgiannidis’ is the first maturing pear cultivar for the market. After harvest, fruits can be kept at room temperature for ≈ 1 week, or they can be refrigerated (1 °C) for ≈ 2 weeks.

Origin

In Greece, the total pear production in 2007 was 75,249 t and the cultivated acreage was 4,000 ha (FAO, 2007). The main pear cultivars grown in Greece are Kristali (Greek local cultivar) and Williams. The cultivar Syrgiannidis was derived from a cross between the pear (*Pyrus communis* L.) cultivars Santa Maria (pollen parent) and Kontoula (Greek local cultivar) made in 1968 at the Greek Pomology Institute by the researcher G. Syrgiannidis, who also made the initial selection 6 years later. ‘Syrgiannidis’ pears are well distinct from those of its parent, ‘Kontoula’. Evaluation of the new cultivar was performed for several years concerning tree performance when grafted on several rootstocks, suitable pollenizers, fruit quality,

and so on. The evaluation and the description were done in the Greek Pomology Institute that is located in Naoussa (northern Greece, long. 22°12'0" E; lat. 40°29'04" N; elevation 225 m). The soil of the experimental orchard at a depth of 0 to 60 cm was characterized as a sandy clay loam, slightly alkaline (pH 7.31), with low electrical conductivity (0.71 mS·cm⁻¹) and low organic matter (1.31%) and CaCO₃ (4.4%) content. Soil nutrient contents were (mg·kg⁻¹): phosphorus 34.2, potassium 282, calcium 586, magnesium 148, boron 0.21, manganese 14, zinc 5.1, iron 25, and copper 2.02. The mean maximum temperature of the experimental area is 38 °C in July and 9.5 °C in January, whereas the mean minimum temperature in January is -7 °C. The scope of this research was to give information about the new pear cultivar Syrgiannidis.

Description

Tree. When scions were grafted on ‘Provence’ quince (BA 29; *Cydonia oblonga* Mill.) rootstock, trees were moderately vigorous with an upright habit. Scaffold branch angle was 38° to 49° from vertical. A high percentage of fruit drop after fruit setting was reported on BA 29 rootstock that was ascribed to its vigor. When scions were grafted on ‘quince A’ rootstock, trees were less vigorous than BA 29 and percentage of fruit drop diminished significantly. Mean trunk circumference in the combinations ‘Syrgiannidis’/BA 29 and ‘Syrgiannidis’/‘quince A’ was 19 cm and 16 cm, respectively, at the

eighth year of the trees. The conformity of scion and rootstock in the combinations ‘Syrgiannidis’/BA 29 and ‘Syrgiannidis’/‘quince A’ was satisfactory. Performance has not been tested on other rootstocks yet. Trees were grafted in situ and started producing fruit 3 years later. Maximum production was reached at the sixth year. Trees were trained to a central leader system. Bearing happens mainly on spurs. When trees set heavy crops, thinning was necessary to improve fruit size and to avoid biennial bearing. Chemical thinning trials were not accomplished for ‘Syrgiannidis’ pear and hand thinning is exclusively performed by growers keeping one fruit per cluster, usually when the crops are heavy. Leaf nutrient concentrations were within the range proposed by Bergmann (1988) (data not shown). Annual fruit production per tree of ‘Syrgiannidis’ grafted on ‘quince A’ rootstock over a period of 3 years (from the sixth until the eighth year of the trees) averaged 41.5 kg (Table 1). Productivity and yield efficiency of ‘Syrgiannidis’ was not different from ‘Etrusca’. Moreover, ‘Syrgiannidis’ matures ≈ 1 week earlier than ‘Etrusca’ (Bellini, 1992). Yield efficiency of ‘Syrgiannidis’ [kg/tree to trunk cross-sectional area (cm²)] at the eighth year of the trees was 0.55. For the same age of the trees, yield efficiency of ‘Syrgiannidis’ was lower than ‘Williams’ when grafted on ‘quince A’ rootstock (Sotiropoulos, 2006). Bark color of 1- to 2-year-old shoots is gray. Branch lenticels are oval, 0.4 to 0.6 mm in diameter, and gray-white. Vegetative buds are medium in size and oblique. Mixed buds are borne on 1-year-old shoots and spurs generally found on shoots at least 2 years old. Chilling requirement of the trees is low.

Leaves. The leaves are oval with attenuate tip, ≈ 54 mm long and 40 mm wide. Leaf surfaces are smooth, the dorsal surface is shiny, and there is no pubescence. The petiole is yellow green and ≈ 36 mm long. Leaf fall occurs in late November.

Flowers. The trees require cross-pollination. Flowering starts in the last week of March, 3 d earlier than ‘Coscia’, 7 d earlier than ‘Beurre d’Anjou’, and 9 d earlier than ‘Santa Maria’. Known suitable pollenizers include the Greek local cultivars Vergina and Kristali (Syrgiannidis, 1992). Flowers have white oval petals and pink anthers. Stamens are white and ≈ 6 mm long. The pistils are 4 to 5 mm in length, rounded, fused at the base, and they are of the same height as the stamens. The pollen is yellow.

Table 1. Productivity, yield efficiency, mean fruit weight, fruit maximum diameter, mean fruit length, and fruit diameter/length of the pear cultivars Syrgiannidis and Etrusca over a period of 3 years (from the sixth until the eighth year of the trees).

Cultivar	Productivity (kg/tree)	Yield efficiency		Fruit diam (mm)	Fruit length (mm)	Fruit diam/length
		[kg/tree to trunk cross-sectional area (cm ²)]	Fruit wt (g)			
Syrgiannidis	41.5 a ^{2*}	0.63 a	131 a	48 b	54 b	0.89 a
Etrusca	40.0 a	0.61 a	137 a	55 a	90 a	0.61 b

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²Means of 30 fruits of 50 trees (five replications \times 10 trees) for 3 years.

*Means followed by the same letter in the same column are not significantly different (Fisher’s F; $P < 0.05$).



Fig. 1. Fruits of the pear cultivar Syrgiannidis.

Diseases. The trees are not tolerant to fire blight [*Erwinia amylovora* (Burr.) Winsl. et. al.] (Syrgiannidis, 1992). Research is needed to evaluate susceptibility to other diseases.

Fruits. Fruit characteristics reported are mean values of 30 fruits from 50 trees (five replications \times 10 trees) of each cultivar taken over 3 consecutive years. The evaluation was performed in a private orchard. The experimental layout was a randomized complete block design including five replications of two cultivars each of 10 trees. The significance of the differences between means was evaluated by using Fisher's analysis of variance at $P < 0.05$ carried out by SPSS Version 17 (SPSS Inc., Chicago, IL). Fruit are typical pyriform with a cavity at the bottom (Fig. 1) with a maximum diameter of ≈ 48 mm, mean fruit length ≈ 54 mm, and mean fruit weight ≈ 131 g. 'Syrgiannidis' fruit weight was similar to that of 'Etrusca'. Fruit length and diameter of 'Syrgiannidis' were lower than that of 'Etrusca', whereas fruit diameter/length was higher in the first cultivar (Table 1). The flesh is creamy white, juicy, fine in texture, flavorful, aromatic, and with very few stone cells (sclereids). The fruit flavor is sweet. When the fruit is ripened, the flesh is crisp. The skin is smooth, free of russetting, and has no tendency to become waxy in storage. When harvested, the skin is yellow-green with red blush where exposed to sunlight. The pedicel of the fruit is medium in length (≈ 18 mm) with a petiole basin low in depth and width. The pedicel is fleshy, especially at its bottom, oblique or upright,

Table 2. Total soluble solids, flesh firmness, and total titratable acidity of fruits of the pear cultivars Syrgiannidis and Etrusca over a period of 3 years.

Cultivar	Total soluble solids ($^{\circ}$ Brix)	Firmness (kg \cdot cm $^{-2}$)	Total titratable acidity (g/100 mL)
Syrgiannidis	12.94 a**	4.77 a	0.25 a
Etrusca	12.01 b	4.73 a	0.24 a

^aMeans of 30 fruits of 50 trees (five replications \times 10 trees) for 3 years. Fruits were pooled from all trees.

^{*}Means followed by the same letter in the same column are not significantly different (Fisher's F; $P < 0.05$).

and averages 2.9 mm in thickness. The calyx tends to be inconspicuous and appressed to the pistillate end at maturity.

Fruit matures on the tree in late June to early July, ≈ 1 week earlier than 'Etrusca', ≈ 3 weeks earlier than 'Coscia', and ≈ 30 d earlier than 'Santa Maria'. In Greece, regarding earliness, 'Syrgiannidis' is the first maturing pear cultivar for the market. As a result, the income for pear growers is usually high. Other important early-maturing pear cultivars grown in Greece (except 'Syrgiannidis' and 'Etrusca') are Kalliopi (Sotiropoulos et al., 2009) and Amalthia. Two harvests are required under moderately cropped conditions. Although fruits are relatively small in size, the acceptance by consumers is high in Greece as a result of the earliness and high quality. Fruits are used exclusively for the local market. 'Turandot', another pear cultivar that ripens at the same time as 'Syrgiannidis', shows higher fruit weight but lower yield (Rivalta and Dradi, 2002).

With regard to harvest maturity indices, the most common used are the total soluble solids content and the change of ground color in skin from green to light yellow. Mature fruits of the cultivar Syrgiannidis were evaluated immediately after harvest. Total soluble solids (measured with an Atago PR-1 electronic refractometer; Atago Co. Ltd., Tokyo, Japan), flesh firmness (measured with an Effegi penetrometer 8 mm tip; Effegi, Milan, Italy), and total titratable acidity as described by Koukourikou-Petridou et al. (2007) are presented in Table 2. Total soluble solids of 'Syrgiannidis' were higher than those of 'Etrusca', whereas total titratable acidity and firmness were not different among these cultivars. After harvest, fruits can be maintained at room temperature for ≈ 1 week or they can be stored at 1 $^{\circ}$ C for ≈ 2 weeks (Syrgiannidis, 1992). After 1 week

storage in room temperature conditions, fruits exhibit flesh breakdown.

In conclusion, 'Syrgiannidis' is a promising summer pear cultivar. Its cultivation is expanding from year to year in Greece as a result of its earliness and high quality that are accepted by the consumers.

Availability

'Syrgiannidis' pear has been registered in the official list of varieties of the Greek Ministry of Agriculture in 1991 and is presently available from the Greek Pomology Institute (P.O. Box 122, 59200, Naoussa, Greece). We have not yet applied for a protection according to UPOV (International Union for the Protection of New Varieties of Plants) guidelines.

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