‘Estrella’ and ‘Sublime’ Apricot Cultivars

José Egea, Jose A. Campoy, Federico Dicenta, Lorenzo Burgos, Jose L. Patiño, and David Ruiz¹

Departamento de Mejora Vegetal, Centro de Edafología y Biología Aplicada del Segura-Consejo Superior de Investigaciones Científicas, P.O. Box 164, E-30100, Espinardo, Murcia, Spain

Additional index words. fruit breeding, *Prunus armeniaca*, fruit quality

‘Estrella’ and ‘Sublime’ are mid–early ripening apricot cultivars (*Prunus armeniaca* L.) with optimal productivity levels, excellent fruit quality, and an attractive color. Although ‘Estrella’ and ‘Sublime’ are both self-incompatible, they are intercompatible cultivars. Bloom dates are very coincident and they can be planted together for successful pollination. Their fruits have excellent organoleptic characteristics, and both cultivars have a free stone and an orange skin ground color, extensive red blush, and orange flesh color, which make them very attractive.

Origin

‘Estrella’ and ‘Sublime’ resulted from a cross made in 2001 at Murcia, Spain, between the North American cultivar Orange Red® (Hough and Bailey, 1982) and the apricot selection ‘Z 211–18’, which was obtained from the CEBAS-CSIC breeding program (Fig. 1). This cross was made with the objective of obtaining mid–early ripening cultivars with excellent fruit quality as well as optimal productivity with reduced need for thinning. The design of this specific intervarietal cross was motivated by fruit quality characteristics of ‘Orange Red’. This cultivar is characterized by especially interesting fruit quality attributes such as orange ground color, intense red blush, orange and juicy flesh, and high organoleptic qualities. It is appreciated greatly by consumers. However, ‘Orange Red’ is also characterized by high chilling requirements (Ruiz et al., 2007), which lead to fructification problems in warm climates, as is the case in the southeast of Spain. In addition, another shortcoming associated with ‘Orange Red’ in our field conditions is low fruit weight. To resolve these

problems, ‘Orange Red’ was crossed with selection ‘Z 211/18’, which is characterized by low chilling requirements and high fruit weight as well as high fruit firmness, orange color, and good organoleptic qualities.

Description

Tree characteristics

Tree description. ‘Estrella’ and ‘Sublime’ were selected originally as seedling trees on their own roots and then grafted onto 4-year-old apricot seedlings (three replicates each). Trees of ‘Estrella’ are large and very vigorous with a medium spread. They have a moderate density of flowers, mainly localized on fruiting spurs of 2 or more-year-old branches, and show a high fruit set. Trees of ‘Sublime’ are also very vigorous and are characterized by an erect growth habit. The flower density is moderate and flowers are localized on both fruiting spurs and productive shoots with a high fruit set. In both cultivars, the tree architecture greatly facilitates pruning (reduced branching habit). ‘Estrella’ and ‘Sublime’ are characterized by optimal productivity levels in comparison with traditional Spanish apricot cultivars. In addition, they have a reduced need for thinning, which reduces the cost of cultivation.

Plum pox virus resistance. Sharka disease, caused by the *Plum pox virus* (PPV), is a serious limiting factor for temperate fruit production in those areas that are affected (Kölber, 2001). All apricot cultivars traditionally grown in Europe are susceptible to this disease (Martínez-Gómez et al., 2000), whereas several cultivars from North America such as ‘Goldrich’, ‘Sunglo’, ‘Orange Red’, and ‘Stark Early Orange’ show resistance to PPV and are used frequently as parents in breeding programs (Egea et al., 1999). In the case of cultivars Estrella and Sublime, ‘Orange Red’ and ‘Goldrich’ were used as parents to obtain PPV resistance. Evaluation of PPV resistance in controlled greenhouse conditions (Martínez-Gómez and Dicenta, 1999), for three cycles of study, showed the resistance of the three studied replications of ‘Estrella’ to Dideron-type PPV isolates, whereas symptoms were observed for the Sublime cultivar.

Time of bloom and floral compatibility. ‘Estrella’ and ‘Sublime’ need ≈950 chill units (Richardson et al., 1974) to break

dormancy under our experimental conditions in Murcia (southeast Spain: lat. 37° N, long. 1° W, alt. 450 m). Therefore, these new cultivars have medium chill requirements (Ruiz et al., 2007). Full blooms for ‘Estrella’ and ‘Sublime’ occurred on 3 Mar. and 2 Mar., respectively (± 3 d with respect to the average of the 3 years), which are early–medium flowering dates among traditional Spanish apricot cultivars (Table 1).

These new cultivars are self-incompatible; this was demonstrated in the field (by bagging branches) and in the laboratory (by observing pollen tube growth in 10 flowers) according to methodology described by Burgos et al. (1993). Polymerase chain reaction (PCR) analysis, using consensus PCR primers, which have been reported as identifying *Prunus* S alleles (Sutherland et al., 2004), revealed that their alleles of compatibility are not coincident (S₁S_{new} for ‘Sublime’ and S₁S₇ for ‘Estrella’) and, because their blooming dates are similar, they can be used to pollinate one another. In addition, other self-compatible cultivars (with the S_c allele of compatibility) with similar blooming dates such as ‘Rojo Pasió’, ‘Thyrinthos’, ‘Canino’, and ‘Soledane’ also can be used as pollinators.

Fruit characteristics

Maturation time. ‘Estrella’ and ‘Sublime’ are mid–early ripening cultivars in comparison with the traditional Spanish apricot cultivars. In our experimental conditions in Murcia, the ripening date for both new cultivars was ≈25 May, some days earlier than the Spanish cultivar Búlida and the North American cultivar Orange Red (Table 1). Fruits of ‘Estrella’ and ‘Sublime’ mature uniformly. At that time in the season, there is limited competition with apricots produced in other European countries (e.g., ‘Early Blush’, ‘Soledane’, and ‘Thyrinthos’). In addition, ‘Estrella’ and ‘Sublime’ fruits are more attractive, firmer, and better-tasting than ‘Mauricio’, ‘Palabras’, and ‘Búlida’, the Spanish cultivars maturing at a similar time.

Fruit size, firmness, and color. Fruits harvested from the original, own-rooted seedling tree and from trees of ‘Estrella’ and ‘Sublime’ grafted onto 4-year-old apricot seedlings (three replicates) were studied over 3 years. ‘Estrella’ and ‘Sublime’ trees and

Fig. 1. Pedigree of ‘Estrella’ and ‘Sublime’ apricots.

Received for publication 22 Oct. 2008. Accepted for publication 10 Dec. 2008.

This work has been financed with several projects of the “Plan Nacional de I+D” of the Spanish Ministry of Science and Technology from 1985, the last one entitled “Mejora Genética del Albaricoquero” (AGL2007-60694).

We thank Antonio Molina and Maria Dolores Nortes for technical assistance in obtaining these cultivars.

¹To whom reprint requests should be addressed; e-mail druijz@cebas.csic.es.

Table 1. Comparative analysis of tree and fruit characteristics of 'Estrella' and 'Sublime', the Spanish cultivar Búlida, the French cultivar Bergeron, and the North American cultivar Orange Red under experimental conditions in Murcia, Spain.

Characteristics	Estrella	Sublime	Búlida	Bergeron	Orange Red
Tree					
Vigor	Very vigorous	Very vigorous	Very vigorous	Very vigorous	Vigorous
Flower density	Medium	Medium	Medium	Medium	Low
Flowering date (full bloom)	2 Mar.	3 Mar.	8 Mar.	13 Mar.	15 Mar.
Floral compatibility	Self-incompatible	Self-incompatible	Self-compatible	Self-compatible	Self-incompatible
Fruit set (1–9)	8	8	9	8	4
Yield (1–9)	8	8	9	7	3
Fruit					
Ripening date	25 May	25 May	26 May	19 Jun.	28 May
Fruit size (g)	92.0	90.0	59.8	70.7	61.0
Firmness (kg·cm ⁻²)	3.7	3.4	2.1	1.70	3.9
Skin ground color	Orange	Orange	Light orange	Light orange	Orange
Percent red blush	40.0	40.0	10.0	15.0	40.0
Flesh color	Orange	Orange	Light orange	Orange	Orange
Sugar (°Brix)	14.0	14.4	10.6	11.9	14.2
Acidity ^z	2.35	1.88	1.29	1.73	1.23

^zTitrateable acidity expressed as grams of malic acid per 100 mL.

Fig. 2. 'Estrella' (left) and 'Sublime' (right) apricot fruits. Scale bar in centimeters.

reference-cultivar trees ('Búlida', 'Orange Red', and 'Bergeron') were cultivated in the same orchards according to habitual apricot orchard management. Fruit characterization of 'Estrella' and 'Sublime' and reference cultivars was made at commercial maturity on the basis of their skin ground color (degreening stage and fully colored). Three replicates of 10 fruits each were selected for each genotype and year. The fruit characteristics of 'Estrella' and 'Sublime' are quite similar (Table 1). They bear very large, globose fruits with average weights of 92 and 90 g, respectively; 'Estrella' and 'Sublime' fruits are also characterized as being very firm (3.7 and 3.4 kg·cm⁻², respectively) at commercial ripeness with no skin cracking and as having a free stone without pit-burning problems. The fruits of both cultivars have an orange skin ground color (hue value = 76.8 ± 2.5, with color space coordinates L* = 63.0,

a* = 10.8, and b* = 46.6 for 'Estrella'; hue value = 77.9 ± 1.9, with color space coordinates L* = 63.1, a* = 10.2, and b* = 47.4 in the case of 'Sublime', as determined with a Minolta CR-300 Chroma Meter, Ramsey, NJ) with ≈40% of the surface covered by an intense red blush and an orange flesh color (hue value = 75.6 ± 1.3, with color space coordinates L* = 62.9, a* = 12.8, and b* = 50.0 for 'Estrella'; hue value = 79.1 ± 1.5, with color space coordinates L* = 63.1, a* = 8.4, and b* = 43.6 for 'Sublime') (Fig. 2).

Organoleptic characteristics. At the commercial-maturity stage, 'Estrella' and 'Sublime' fruits are sweet (14.0 and 14.4 °Brix on average, respectively) and slightly acid (2.35 and 1.88 g malic acid/100 mL on average, respectively) (Table 1). 'Estrella' and 'Sublime' fruits have an excellent taste and high apricot aroma.

Availability

The Estrella and Sublime cultivars are registered in the European Union Community Plant Variety Office with the registration numbers 2007/1425 and 2007/1422, respectively. Virus-free budwood is available from the CEBAS-CSIC (Spain). The budwood has been tested and is free of the following viruses: *Prunus necrotic ringspot virus*, *Apple mosaic virus*, *Apple chlorotic leaf spot virus*, *Prune dwarf virus*, and PPV.

Literature Cited

- Burgos, L., T. Berenguer, and J. Egea. 1993. Self- and cross-compatibility among apricot cultivars. *HortScience* 28:148–150.
- Egea, J., L. Burgos, P. Martínez-Gómez, and F. Dicenta. 1999. Apricot breeding for sharka resistance at CEBAS-CSIC, Murcia (Spain). *Acta Hort.* 488:153–157.
- Hough, L.F. and C.H. Bailey. 1982. 30 years of apricot breeding in New Jersey. *Acta Hort.* 121:207–210.
- Kölber, M. 2001. Workshop on Plum pox. *Acta Hort.* 550:249–255.
- Martínez-Gómez, P. and F. Dicenta. 1999. Evaluation of resistance to sharka in the breeding apricot program in CEBAS-CSIC in Murcia (Spain). *Acta Hort.* 488:731–737.
- Martínez-Gómez, P., F. Dicenta, and J.M. Audergon. 2000. Behaviour of apricot (*Prunus armeniaca* L.) cultivars in the presence of sharka (*Plum pox potyvirus*): A review. *Agronomie* 20:407–422.
- Richardson, E.A., S.D. Seeley, and R.D. Walker. 1974. A model for estimating the completion of rest for Red Haven and Elberta peach trees. *HortScience* 9:331–332.
- Ruiz, D., J.A. Campoy, and J. Egea. 2007. Chilling and heat requirements of apricot cultivars for flowering. *Environ. Exp. Bot.* 61:254–263.
- Sutherland, B.G., T.P. Robbins, and R. Tobutt. 2004. Primers amplifying a range of *Prunus* S-alleles. *Plant Breed.* 123:582–584.