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About the Cover:

Juliet™ Apple Grown For Organic Production in France

Juliet™ is a 2003 release of the Cooperative Apple Breeding Program (PRI) of Purdue University, Rutgers University, and the University of Illinois (Korban et al., 2003). In 1993, the selection caught the attention of Jean-Louis Escande, a nurseryman in Saint-Vite, France, who saw it under test at Rutgers University and subsequently evaluated the selection in France. The nursery is now owned by his grandson Benoit Escande who found the selection well suited to southern France, and promoted it for organic production. The selection was patented in France as 'Co-op 43' (cov EU N°13 110), granted June 15, 2004. The trade name Juliet™ was proposed by Jules Janick who managed the license agreement between the university partners and the French nursery (Pépinières Escande).

Juliet™ is a red, striped apple, slightly oblate, 64–76 mm in diameter (Fig. 1). The skin is smooth and waxy, with inconspicuous lenticels, and has little tendency for russet. The fruit is crisp, breaking, full flavored – sweet, mild-subacid with a soluble solids content of ~15% at harvest maturity, and it is very juicy. The flesh is highly non-browning. A customer in Vancouver, Canada, expressed concern that the apples had been irradiated as the flesh did not discolor even after three

weeks when cut. The cultivar has proven to be productive and easy-to-grow, and has special attributes. It is a low-ethylene producing fruit with highly desirable storage qualities. Fruit maintains firmness and crisp texture in refrigerated storage for over one year (Gussman et al., 1993; Goffreda et al., 1994) although flavor becomes bland after nine months. It retains flavor in CA storage for over one year.

The tree is moderately vigorous, spreading, semi-spur, and crops annually. It requires moderate pruning, but fruit thinning is essential. Juliet™ is field immune to apple scab incited by *Venturia inaequalis* (Cke) Wint. and shows resistance to powdery mildew incited by *Podosphaera leucotricha* (Ell & Ev.) Salm., and to fireblight incited by *Erwinia amylovora* (Burr.) Winslow et al. Leaves are moderately susceptible to cedar-apple rust incited by *Gymnosporangium juniperi-virginianae* Schw., but the fruit shows resistance.

Based on its published pedigree, Juliet™ was assumed to carry the *Vf* gene derived from *Malus floribunda* 821. However, in a 1998 analysis by Shawn Mehlenbacher using DNR primers (unpubl.), the selection did not contain markers associated with *Vf*,

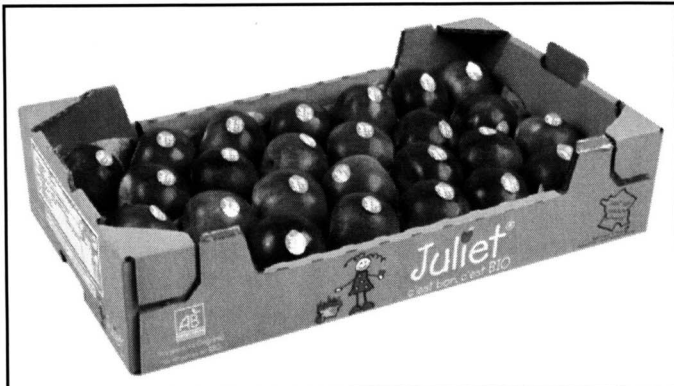


Fig. 1. Juliet™ apple.



Fig. 2. Logo of Juliet™

Vm, or *Vb* (Janick et al., 1996). Furthermore, in crosses carried out by Joseph Goffreda, scab-resistant segregants displayed *Vr*-like reactions. As a result the assumed pedigree of Juliet™ is probably incorrect.

Juliet™ is grown in France as a “club apple,” exclusively for organic production. The association of growers in the club are known as “Les Amis de Juliet” (The Friends of Juliet). It has been expertly marketed with a striking logo that is registered and in specially marked containers (Fig. 2). Many products, such as apple sauce and puree, apple chips, juice, and preserves are produced without any added coloring, preservatives, or sugar. The juice is light yellow in color.

The apple and apple products are now distributed throughout Europe, Asia, the Middle East, and Canada. Products are sold in organic stores, and in organic sections of supermarkets. In 2014, about 400,000 trees on 320 hectares were planted across Southern France, mostly on *Malling 7* rootstocks in

high density, organic plantings. Production was 6000 tonnes in 2014 and is expected to reach 10,000 tonnes in 2017. Production per hectare is about 50 tonnes·ha⁻¹ with half meeting fresh market standards and the other half being processed.

The success of Juliet™ in the organic market in France suggests that this cultivar could be promoted for organic production in the United States as well in other apple-producing countries. Furthermore, the non-browning character indicates that it could be utilized for the apple slice market. The light-colored juice could be exploited as a new specialty product.

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Cover photograph: Organically grown trees of Juliet™ on M7 rootstock growing under hail netting in France.

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