

‘Gloria’, a Novel Late Season Peach Cultivar with Firm, Sweet, Low-acid Freestone Flesh

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Abstract

Gloria™ NJ 351, a new peach (*Prunus persica*) variety resulting from a cross between ‘NJ304’ as the seed parent with ‘J19-19-862144’ peach tree, is a large, globose to slightly ovate, 60-90% scarlet red over orange-yellow ground color, yellow-fleshed, freestone peach ripening from August 21-24, approximately 26 days after Redhaven. It was released after regional adaptability testing at Rutgers University’s fruit research farms and test blocks at growers’ orchards in New Jersey. Fruit is nearly non-melting and has a typical weight of 255 g, with soluble solids generally upward of around 12 °Brix. Fruit can easily grow larger than 75 mm (3 inches) in diameter at commercial maturity. The flesh is very firm, low in acidity, with good flavor, and exhibits excellent keeping quality. The tree is spreading, vigorous, and very productive with low susceptibility to bacterial spot. The fruit physical and chemical properties of ‘Gloria’ were comparable to or better than ‘Julyprince’, or ‘Messina’, popular varieties in this growing season. In 2025, the first bloom occurred three to four days later, and full bloom was seven to 11 days later than the other two concurrent varieties. The delayed and prolonged bloom trait is very useful in avoiding frost damage. Additionally, fruit remains on the tree longer without losing its firmness and other fruit qualities after reaching commercial ripeness. All these traits qualify ‘Gloria’ as a novel peach variety.

Introduction

Rutgers University’s tree fruit breeding program has continually developed varieties to meet consumer expectations and address the challenges faced by growers and packers. There are several popular mid-to-late August varieties, including ‘Messina’, ‘Julyprince’, and ‘Flamin’ Fury PF 24’, planted throughout the Mid-Atlantic US. These yellow-fleshed varieties are large-fruited, high-yielding, and possess other desirable traits. However, a few challenges remain. Frecon and Ward (2013) described ‘Julyprince’ and ‘Flamin Fury PF 24’ as moderately susceptible to bacterial spot, a disease of concern to growers in New Jersey and other regions. Another significant risk of growing peaches in New Jersey and other eastern peach-growing regions is the threat of spring frost. The increased frequency of frost in the last few decades has threatened the sustainability of the peach industry in these regions. ‘Flamin Fury PF 24’ is susceptible to frost damage, as evidenced by a high

number of small, undeveloped fruits on the tree (data not shown). Often, during mid-to-late August, there is an oversupply of peaches in the New Jersey market from other regions. Peaches rapidly lose softness once they have achieved commercial maturity; there is a limited harvest and marketing window for most peach varieties. The commercial shipping industry demands peaches that can maintain firmness for a longer period and provide a longer marketing window. Furthermore, a recent study found that young consumers prefer firm, crisp peaches with good flavor (Olmstead et al., 2015). ‘Gloria’ was developed to address the challenges outlined above. This variety has excellent tree and fruit characteristics like other well-known varieties in this harvest window. In addition, it has a unique delayed and extended bloom, and the ability to hang and store much longer than any other varieties, a trait that makes it a novel peach cultivar. ‘Gloria’ provides an alternative to growers who may wish to plant or replace concurrent varieties.

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Materials and Methods

Gloria™ cultivar ‘NJ351’ resulted from crossing ‘NJ304’ as the seed parent with ‘J19-19-862144’ peach tree, as the pollen parent (Fig. 1). The variety was asexually reproduced at the Rutgers Fruit Research and Extension Center in Cream Ridge, N.J. The new variety differs from the seed parent ‘NJ304’ in that the new variety has firm fruit with yellow-orange flesh, while the seed parent has soft

1976), which curtails ethylene accumulation, resulting in firm, crisp flesh (Hayama et al., 2006).

Performance data from ‘Gloria’ NJ 351, ‘Messina’, and ‘Julyprince’ were based on multiple non-replicated trees in a variety block in southern New Jersey, a primary peach growing region of the State. ‘Gloria’ and ‘Messina’ were grafted on rootstock ‘Lovell’ and planted in 2016 at peach variety block RAREC, in Bridgeton, New Jersey. ‘Julyprince’ was

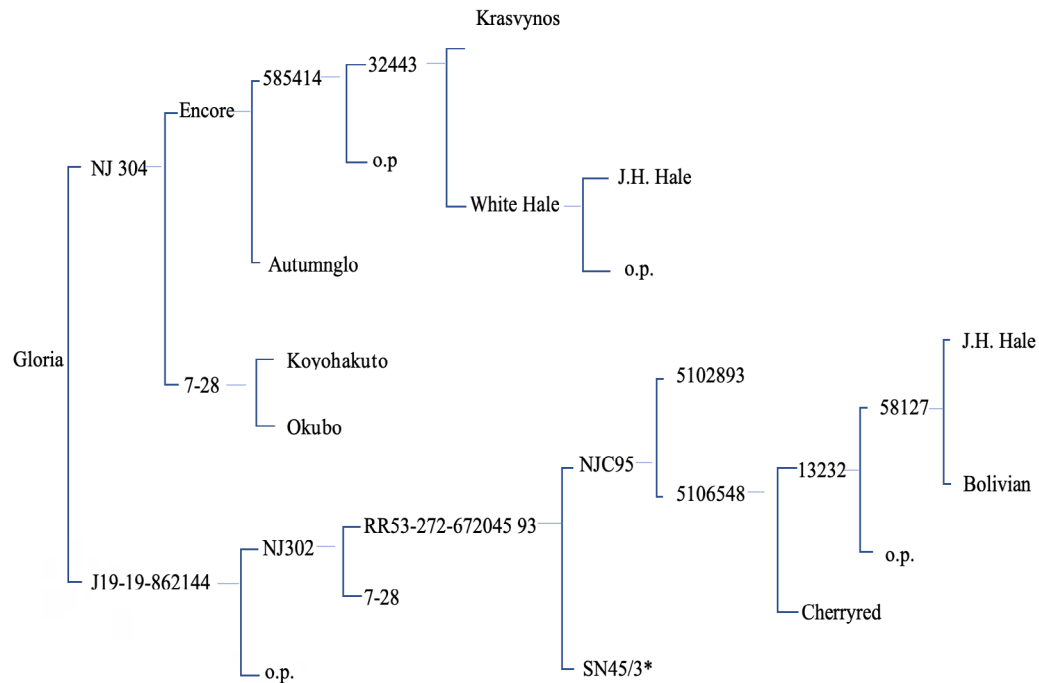


Figure 1. Pedigrees of ‘Gloria’ peaches (o.p. = open-pollinated).

fruit with white flesh. The new variety differs from pollen parent ‘J19-19-862144’ in that the new variety has fruit with a bright yellow-orange ground color and yellow-orange flesh, while the pollen parent has fruit with a slight green-white ground color and white flesh. The resulting tree was selected when growing in a cultivated area as the 34th tree in the 40th row of Block K at the Rutgers Fruit Research and Extension Center in Cream Ridge, New Jersey and has been tested for eight years at the replicated orchard blocks in Richwood and New Jersey and at the Rutgers Agricultural Research and Extension Center (RAREC) in Upper Deerfield Township, New Jersey. One of the parents of ‘NJ 304’ is ‘7-28’, which was derived from a cross between ‘Koyohakuto’ x ‘Okubo’ from Japan. This low-acid peach is homozygous recessive for the ‘stony-hard’ genotype (Yoshida

grafted on ‘Lovell’ rootstock and planted in 2014 at the commercial peach block in Franklinville, which is 9.8 miles away from RAREC. The agro-climate and soils are comparable at both sites. Fruit physical and chemical measurements were made during two years for ‘Gloria’ and ‘Messina’ in 2021 and 2022, and for ‘Julyprince’ in 2022 and 2025.

Description

‘Gloria’ is a very attractive, large, late-season peach with very firm, sweet, mild, low-acid freestone flesh (Goffreda and Voordeckers 2006). The skin is covered with a 60-90% scarlet red blush over a yellow-orange under color (Fig. 2). The flower is small, non-showy, and pinkish-red, blooming around April 10 in southern New Jersey. The tree is productive, vigorous, and spreading, with low susceptibility to



Figure 2. Fruit appearance of ‘Gloria’ peaches at ripening.

bacterial spot caused by *Xanthomonas pruni*. This variety is distinguished from other peach varieties by its unique combination of non-showy flowers, fruit that ripen in late-midseason, attractively blushed fruit, freestone fruit with a nearly non-melting texture and a sweet, low-acid flavor, and that retains its firmness well. Characteristics of this variety, such as growth and color, may change in response to varying environmental conditions (including light, temperature, moisture, and nutrient availability) or other factors. The variety ‘NJ351’ was patented on November 20, 2007, under the trade name ‘Gloria’, and US Patent number 18224 (Goffreda and Voordeckers 2006).

Performance

In 2025, ‘Gloria’ reached first bloom on April 3, which is a few days after the first bloom of ‘Mes-

sina’ (Mar 31) and ‘Julyprince’ (April 1). ‘Gloria’ achieved full bloom on April 14, which was seven days after ‘Julyprince’ and 11 days after ‘Messina’ (Table 1). These clearly indicate that Gloria has a delayed and extended bloom (Table 1). Though the reported bloom data are for one year, the delayed and extended bloom of ‘Gloria’ has been observed consistently over the years. Fruit set was measured on May 30th, before the June drop or fruit thinning. Fruit set was recorded using visual ratings, as shown in Table 1. Fruit set was very high in ‘Gloria’, requiring moderate to heavy thinning, compared to ‘Messina’ and ‘Julyprince’, which had a normal fruit set and required slight to moderate thinning (Table 1). Harvest decisions for each variety were based on visual maturity indices, such as ground color and size.

At harvest, a sample of 20 fruits was picked from each variety block. Fruit weights were measured in grams (g), using a digital scale, and fruit diameter was measured in millimeters (mm) using digital calipers. All three varieties had a mean fruit diameter greater than 70 mm (2 ¾ inches, Table 1), a large size according to the commercial standards. Flesh-firmness was measured by mid-cheek on opposite sides of the fruit (perpendicular to the suture) using the penetrometer, equipped with a stone fruit tip. Fruit firmness was greater than 10 lbs. (of force) for ‘Gloria’, ‘Messina’, and ‘Julyprince’ varieties, indicating good firmness for storage (data not shown). However, the slow softening of ‘Gloria’ fruits during the ripening and homozygous recessive pedigree ‘7-28’ indicates that ‘Gloria’ could be heterozygous for the stony hard genetics. Okie and Layne (2008) have reported similar traits for ‘Julyprince’. The eating

Table 1. First and full bloom dates and fruit set ratings (2025); fruit taste, mean total soluble solids (TSS), mean titratable acidity (TA), and mean fruit size of ‘Gloria’ (2021, 2022), ‘Messina’ (2021, 2022), and ‘Julyprince’ (2022, 2025) grown at Southern New Jersey orchards.

Cultivar	First bloom	Full Bloom	^z Fruit set ratings	Taste ratings	TSS (Brix)	TA (g/l)	Fruit size mm diameter
‘Gloria’	April 3	Apr 14	5	Very sweet, sub-acid	13.5 ± 0.9	1.0 ± 0.2	77.9 ^y
‘Messina’	Mar 31	Apr 3	4	Very sweet, mildly tangy	13.2 ± 1.0	1.6 ± 1.1	73.4 ± 4.6
‘Julyprince’	Apr 1	Apr 7	4	Sweet, mildly tangy	10.4 ± 1.1	1.3 ± 1.2	80.3 ± 2.5

^zFruit set ratings: 1= No fruit; 2= few scattered fruits; 3= very light crop of 100-200; 4= normal crop of fruit requiring little fruit thinning; 5= heavy crop requiring moderate to heavy thinning.

^y = only one year of data available. ± indicates standard deviation.

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experience of ‘Gloria’ may differ from traditional peach consumers’ expectations; hence, consumers should be educated about this, perhaps marketing it as ‘neat peach’ or something to that effect.

For chemical analysis, three replications (sub-samples) of five peaches were selected from the 20 fruit samples. For each subsample, the fruits were sliced, and then juice was extracted using the handheld crusher. One fruit was randomly sampled from the remaining five fruits for taste evaluations. Three volunteers rated sweetness and tanginess on a scale of 1 to 10, with 10 representing the sweetest and tangiest. The sweetness was categorized as less than 4 = low sweet; 4-6 sweet; 6-8 = very sweet, and greater than 8 = exceptionally sweet. The tanginess was categorized as less than 4 = sub-acid; 4-7 mildly tangy; and greater than 7 = tangy (Table 1). Total soluble solids (TSS) of strained juice were measured for sweetness, using a refractometer (Atago, Japan). ‘Gloria’ and ‘Messina’ had the mean TSS of greater than 13 brix, which was reflected in the taste rating as very sweet, and ‘July Prince’ had the mean TSS of 10.4 brix, which was reflected in the taste rating as sweet. However, all three varieties achieved sugar content near or above 11 Brix (Table 1), a desirable level of sweetness (personal communication, fruit sourcing manager, Wakefern Food Corporation, NJ, USA). The titratable acidity (TA) was measured by titration to a pH endpoint of 8.1 using 0.1 mol/L NaOH. The TA was comparable across all three varieties; however, the tanginess is a combination of acidic flavor influenced by sweetness. As a result, ‘Gloria’ tasted very sweet and sub-acid, while ‘Messina’ was very sweet and mildly tangy, and ‘Julyprince’ was sweet and mildly tangy.

Availability

‘NJ351’ has been named and registered as ‘Gloria’ by Adams County Nursery in Aspers, Pennsylvania. Adams County Nursery is the primary licensee of ‘Gloria’ and manages its propagation and sales.

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