

'Star' Southern Highbush Blueberry

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Additional index words. *Vaccinium corymbosum*, *V. darrowi*, low-chill, blueberry breeding, chilling requirement, disease resistance

Southern highbush blueberry cultivars are hybrids bred from a gene pool developed by crossing northern highbush cultivars (largely *V. corymbosum* L.) with one or more low-chill blueberry species native to the southeastern United States. *Vaccinium darrowi* Camp has been the most widely used source of climatic adaptation to warm areas. *Vaccinium darrowi* is a low-growing, late-ripening species with small fruit, and several generations of backcrossing, intercrossing, and selection are normally needed to produce upright-growing cultivars with berries large enough for commercial exploitation.

The principal value of southern highbush blueberry cultivars is that they can be cultivated where the mean temperature of the three coldest months is as high as 15 °C, whereas northern highbush blueberry cultivars are not consistently productive where mean temperatures for these months exceed 10 °C. The wide range of northern highbush cultivars and the wide geographic range over which they are cultivated allows fresh fruit harvest from mid-May through the end of September in the northern hemisphere and from mid-November through the end of March in the southern hemisphere. The remaining gaps in the harvest year can be filled by growing southern highbush cultivars in areas where temperatures are warm in late winter and early spring. Low-chill southern highbush cultivars are needed in these areas, because climates that are warm enough to promote early berry development in late winter and early spring do not provide sufficient chill units during winter to break dormancy in high-chill cultivars. Southern highbush cultivars can provide fresh blueberries in April and early May in the northern hemisphere and in October and early November in the southern hemisphere. They also make it possible for millions of people living in subtropical and warm-temperate areas to produce blueberries in home gardens or for local markets.

'Sharpblue' and 'Flordablue', the first southern highbush blueberry cultivars, were released by the Univ. of Florida in 1975 (Sharpe and Sherman, 1976), and other low-chill blueberry cultivars have subsequently been re-

leased from breeding programs in Florida, Mississippi, North Carolina, and Georgia (American Society for Horticultural Science, 1997). 'Star' was released in 1996 by the Univ. of Florida to provide another southern highbush blueberry cultivar with very low chilling requirement, early ripening, and high berry quality.

Origin

'Star' originated from the cross O'Neal x Fla. 80-31, made in a greenhouse in Gainesville, Fla., in 1981. The exact pedigree of Fla. 80-31 is unknown; it was an advanced selection from the Florida recurrent selection program, which was begun in the early 1950s after initial populations had been formulated by crossing

northern highbush cultivars with *V. darrowi* and by crossing *V. darrowi* with *V. ashei* Reade. The pollen parent, 'O'Neal', was selected at Castle Hayne, N.C., in 1972 from a cross (Wolcott x Fla. 4-15) made by Arlen Draper at Beltsville, Md.; its full pedigree is given by Ballington et al. (1990).

'Star' was first evaluated along with 10,000 other blueberry seedlings in a high-density fruiting nursery in Gainesville, Fla., in May 1983. Based on high fruit quality, early ripening, and low chilling requirement, 'Star' was selected in 1983 for further testing. Superior fruit quality in subsequent years led to its propagation by softwood cuttings in 1987 as Fla. 87-139-S, and eight-plant test plots were established at the Univ. of Florida Horticultural Unit in Gainesville and at a nearby commercial blueberry farm. These plots were observed annually for the next eight harvest seasons. Other test plots were established in north Florida and southeast Georgia between 1990 and 1994. 'Star' was released as a commercial cultivar because of its high fruit quality, good plant survival, and late-April to early May harvest season in these test plots. Application was made for a U.S. plant patent in 1995 (USPP10675), and nurseries were licensed to propagate the cultivar beginning in 1996. Over 40 ha of 'Star' have been harvested

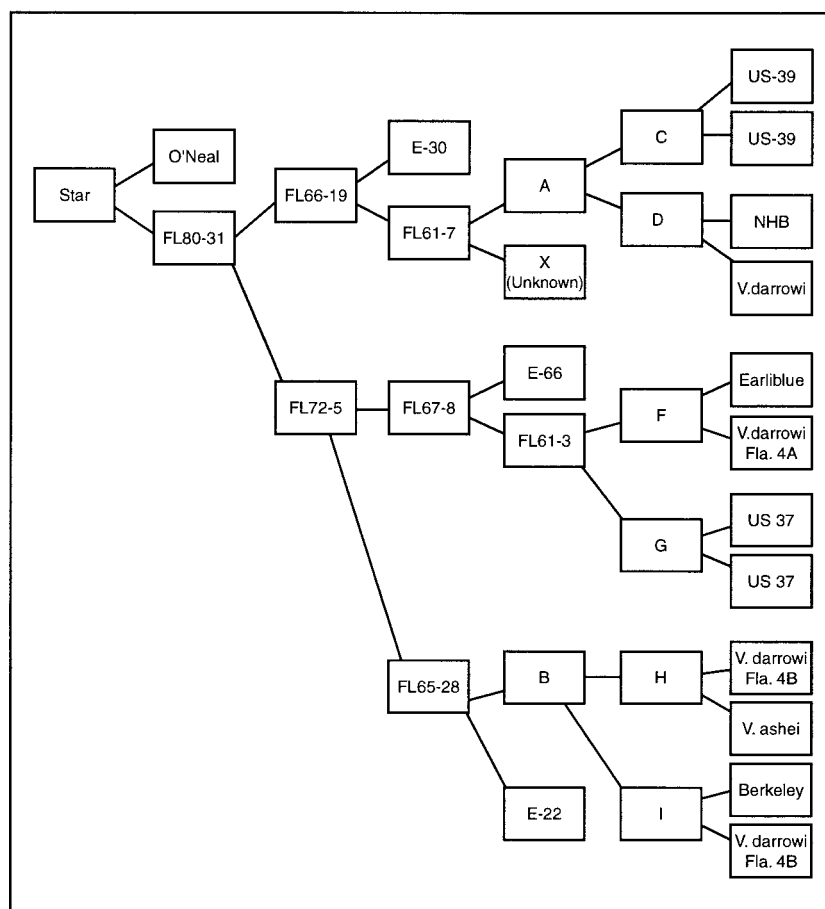


Fig. 1. Pedigree of 'Star'. The seed parent is the upper and the pollen parent is the lower member of each couplet. "E" numbers are northern highbush seedlings from USDA crosses selected in Michigan and brought to Florida prior to 1960 by the late Arthur Elliott. A, B, C, D, E, F, G, H, and I were unnamed Florida selections. NHB is one of the following northern highbush cultivars: Earliblue, Bluecrop, Berkeley, Angola, and Ivanhoe.

Received for publication 16 Sept. 1999. Accepted for publication 7 Nov. 1999. Florida Agricultural Experiment Station Journal Series No. R-07103. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.
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Table 1. Characteristics of 'Star' and other southern highbush cultivars adapted to northeast Florida.^z

Cultivar	Chill requirement ^x	Fruit characteristic rating ^y					Bush vigor	Spring leafing	Date of first harvest ^w
		Size	Color	Scar	Firmness	Flavor			
Star	400	8	5	8	8	8	7	8	25 Apr.
Sharpblue ^v	300	8	5	5	8	8	7	8	1 May
Gulf Coast ^u	100	8	5	7	7	8	8	8	25 Apr.
Georgia Gem	400	8	6	5	8	8	6	6	10 May
Santa Fe	300	8	5	8	8	8	8	7	1 May
O'Neal	450	8	5	8	8	8	7	5	1 May
Misty	400	8	6	8	8	8	7	2	1 May

^zBased on 2–15 years of observations in northeast Florida.^yScale: 1–9 where: 1 = small, very dark, a deep or tearing scar, very soft, very poor flavor, very low vigor, and very poor production of new leaves during the month after flowering; and 9 = the best that can currently be found in southern highbush cultivars.^xMean number of hours below 7 °C per winter in areas of Florida where the cultivar shows severe lack of chilling in ≈25% of the years.^wMean date when the first 25% of the fruit is ripe in Gainesville, Fla.^vFruit size and firmness decrease markedly after the fourth week of harvest.^uA high percentage of the berries retain the pedicel when harvested.

commercially in north Florida and south Georgia for the last 3 years.

Description

'Star' plants are moderately upright with a medium suckering tendency. Four-year-old plants grown in pine-bark beds in Gainesville averaged 2-m tall with a 1.2-m canopy diameter. The plant resembles 'O'Neal' in growth habit. The leaves are similar in size to those of 'O'Neal' and 'Sharpblue', averaging ≈50-mm long and 25-mm wide. The number of flower buds produced on 'Star' in the fall is somewhat below average for highbush blueberries. This reduces the problem of over-fruiting in the spring, but also prevents 'Star' from bearing extremely heavy crops.

'Star' has a low chilling requirement. During 12 years in Gainesville, Fla. (mean temperature of the three coldest months, 13.1 °C), the plants have flowered and fruited every year, although the mild winter of 1998–99 resulted in flowering that was ≈2 weeks later than for 'Gulf Coast' and other cultivars with extremely low chilling requirements. A chill-hour designation to compare 'Star' with other blueberry cultivars grown in the southeastern United States is ≈400 h below 7 °C. In Gainesville, 'Star' is normally in full flower by 25 Feb. and the first 25% of the fruit can normally be harvested by 25 Apr. 'Star' has less tendency to flower during warm periods in January than do most low-chill cultivars. 'Star' normally flowers 7–10 d later than do 'Sharpblue' and 'Gulf Coast', but begins to ripen at about the same time. Unlike some southern highbush cultivars, 'Star' shows

strong leaf bud break before it reaches full bloom, and normally produces an abundance of new leaves early in the spring. 'Star' yields a partial crop when self-pollinated, but cross-pollination with other tetraploid cultivars is needed for maximum fruit set, berry weight, and earliness.

'Star' produces large, high-quality berries (Table 1). Berry shape and weight are similar for 'Star' and 'O'Neal.' Typical berries weigh 1.6 g, have a cross-sectional diameter of about 14 mm, and, like the berries of 'O'Neal', are wider than they are tall. 'Star' pedicel scars are small and dry, the berry is very firm, and the flavor is pleasantly sweet with some acidity. The calyx lobes on the ripe berry are well developed and often form a conspicuous, five-pointed star. 'Star' fruit ripen over a short period. The crop normally advances from 10% ripe to 80% ripe in less than 3 weeks in Gainesville. 'Star' normally maintains its berry weight throughout the harvest season. Hand-harvesters report that 'Star' is easier to harvest than are most other southern highbush cultivars. Growers and shippers report that 'Star' is easy to manage in the packinghouse and that the fruit holds up well when shipped internationally by air.

'Star' plants propagate readily from softwood cuttings under mist. Rooted cuttings grow well in nursery beds. On suitable sites, 'Star' plants grow as fast and survive as well or better than do 'Sharpblue' plants. Field survival at the many locations in north Florida and southeast Georgia, where 'Star' has been observed for several years, indicate that the plant has medium to high resistance to root rot (*Phytophthora cinnamomi* Rands), stem can-

ker [*Botryosphaeria corticis* (Demaree and Wilcox) Arx and Muller], and stem blight [*Botryosphaeria dothidia* (Moug. ex Fr.) Ces. And deNot.]. 'Star' is somewhat susceptible to several leaf-spotting fungi that are common on blueberries in the southeastern United States, and some fungicidal sprays are needed after harvest to maximize yields.

The main virtues of 'Star' are its low chill requirement, desirable bush habit, high vigor and survival, concentrated early ripening, and high fruit quality. The principal limitations that have been observed to date are its medium yield capacity and its inability to fruit reliably in areas in Florida where mean winter temperatures exceed 14 °C.

Availability

'Star' has been patented (U.S. Plant Patent Number 10,675). Patent rights have been assigned to Florida Foundation Seed Producers, P.O. Box 309, Greenwood, FL 32443. Nurseries and growers wishing to propagate 'Star' should contact the Foundation for information on licensing.

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