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'Chanticleer' Highbush Blueberry

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'Chanticleer' is an early-maturing tetraploid highbush blueberry (*Vaccinium corymbosum* L.) that was developed by the cooperative breeding program of the Agricultural Research Service (ARS) of the U.S. Dept. of Agriculture (USDA) and the New Jersey Agricultural Experiment Station (NJAES). 'Chanticleer' takes its name from the rooster in the medieval story "Reynard, the Fox", and was given the name in recognition of its characteristic of very early ripening.

Origin

'Chanticleer', tested as G-481, originated from the cross G-180 x Me-US 6620 (Fig. 1), and is a sibling of the cultivar Sunrise (Draper et al., 1991). This cross was made by A.D. Draper at Beltsville, Md., in 1974, and has four highbush cultivars ('Ivanhoe', 'Earliblue', 'Collins', and 'Coville') and one lowbush blueberry *(V. angustifolium* Ait.) selection (North Sedgwick) in its ancestry (Fig. 1). 'Chanticleer' was selected in 1978 from a seedling field grown at the Atlantic Blueberry Co., Hammonton, N.J., by A.D. Draper, G.J. Galletta, and G. Jelenkovic. These researchers, along with N.V. and M.K.E., continued the evaluation of 'Chanticleer' from 1980 through 1996 in test rows of vegetatively propagated clones at the Atlantic Blueberry Co., and finally in a replicated planting of elite clones and standard cultivars at Variety Farms, Hammonton, N.J., consisting of four replicates of five plants each in a randomized complete-block design. Both the Atlantic Blueberry Co. and the Variety Farms trials were located on farms in USDA Plant Hardiness Zone 6, on soils that are mostly Atsion sand containing 3% to 15% organic matter. Cultural practices in the yield trial plots at Variety Farms included adding peat to the planting holes, mulching with pine bark, and the use of solid set irrigation for irrigation and frost protection. Testing of 'Chanticleer' was also conducted in Grand Junction, Mich.; Clarksville, Ark.; North Williamette, Ore.; and Castle Hayne, N.C. 'Chanticleer' was introduced in 1997.

Description

Evaluation of the original 'Chanticleer' plant, and of plants propagated from it at Hammonton, N.J., indicated that the most impressive traits of 'Chanticleer' were ripening dates consistently earlier than 'Weymouth' (the early standard in New Jersey), later flowering than 'Weymouth', and good quality fruit, larger than 'Weymouth'. 'Chanticleer' ripens its fruit 2–5 d earlier than 'Weymouth', and is superior in fruit size and color. Its fruit are medium sized, medium to light blue, with dry scars and good firmness (Fig. 2). 'Chanticleer' fruit is sweet, subacid, and mild-flavored. Numerical rating data collected for 10 years on the original plant and clonally propagated plants show that 'Chanticleer' fruit rated slightly lower for size, about equal for color, scar, and firmness, but slightly lower than 'Duke' for flavor (Table 1). Its main advantages over 'Sunrise' are larger size and lighter color. Its advantages over 'Bluetta' (data not shown) are larger fruit, better scar, and better firmness. In a detailed comparison of fruit characteristics of 'Chanticleer' with 'Weymouth', 'Duke', and 'Bluecrop' (Table 2), 'Chanticleer' proved superior to 'Weymouth' in berry size, color, firmness, and soluble solids. The estimated date for 50% ripe fruit was at least 2 days earlier than 'Weymouth' in 1996 and 1997. Production has been equivalent to or better than 'Weymouth' (Table 2). In 1996, 'Chanticleer' had 52% of its fruit ripe by the first harvest, compared with 36% ripe for 'Weymouth', and 12% for 'Duke' on the same date. In 1997, these values were 26%, 31%, and 10% respectively. To the untrained eye, 'Chanticleer' will not always appear to be substantially earlier than 'Weymouth', but, in fact, it

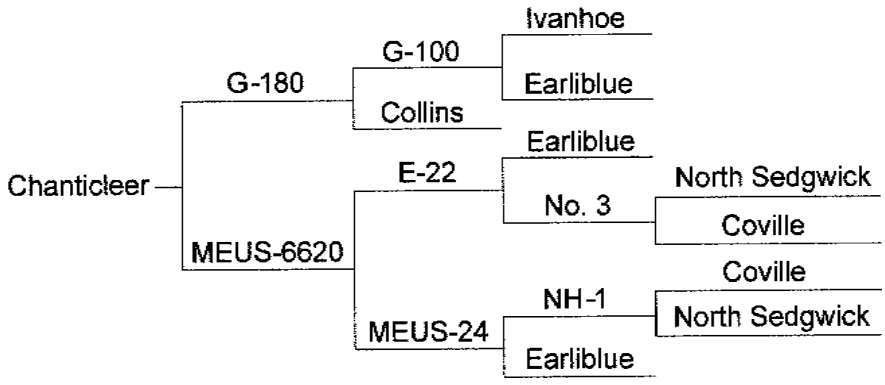

Fig. 1. Pedigree of 'Chanticleer' highbush blueberry.

Table 1. Subjective ratings for fruit quality characteristics and productivity for 'Chanticleer', 'Duke', and 'Sunrise' blueberry at Atlantic Blueberry Co., Hammonton, N.J., 1980–89.

	Fruit quality characteristics[z]					
Cultivar	Size	Color	Scar	Firmness	Flavor	Yield
			Chanticleer			
Mean	7.5	7.9	8	7.8	6.4	7.8
Range	7–8	7–8	8	7–8	6–7	6–9
			Duke			
Mean	7.8	8.0	8.0	7.9	6.7	8.6
Range	7–8	8	8	7–8	6–7	8–9
			Sunrise			
Mean	7.3	7.6	8.2	7.8	7.1	7.5
Range	6–8	7–8	8–9	7–8	7–8	6–8

[z]For size, scar, firmness, flavor, and yield, 1 = poorest, 10 = best; for color, 1 = dark, 10 = light.

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Fig. 2. Fruit of 'Chanticleer' highbush blueberry.

nearly always ripens a greater portion of its crop at the first harvest. Given that 'Chanticleer' and 'Weymouth' have comparable crops, the first picking of 'Chanticleer' will be greater than that of 'Weymouth', thus giving growers an advantage in early market sales. In postharvest storage studies, 'Chanticleer' has proven generally superior to 'Weymouth' under a range of storage regimes, consistently having higher percentages of sound fruit after 1 week of storage. Its performance in storage is comparable to 'Sunrise' and 'Duke' at 5 °C and 10 °C, but not as good as 'Duke' at 21 °C (Table 3).

'Chanticleer' is an upright, medium-height bush, in comparison to the shorter, more spreading habit of 'Weymouth'. 'Chanticleer' leaves exhibit traces of variegation, which can range from virtually nonexistent in field-grown plants, to moderately pronounced in plants being propagated under greenhouse conditions. 'Chanticleer' bears its fruit in terminal clusters, which are generally on the perimeter of the bush, unlike 'Weymouth', which has more of its fruit within the plant canopy. Fruit can be hand-picked cleanly and easily, and also appears suitable for machine harvesting. 'Chanticleer' flowers slightly later than 'Weymouth', offering improved avoidance of damage from late spring frosts, but

Table 2. Fruit weight, color, firmness, soluble solids, titratable acidity, estimated 50% ripening dates, harvest interval, and yield for 'Chanticleer', 'Weymouth', 'Duke', and 'Bluecrop' blueberry across all harvests in Hammonton, N.J. in 1996, 1997, and 1998, for plants set in 1994.

	Fruit quality characteristics[z]					Harvest characteristics		
Cultivar	Berry wt ± SE (g)[y]	Color (L)[x]	Firmness (g·mm^{-1})[w]	Soluble solids (Brix)	Titratable acidity (% citric acid)	Estimated date of 50% ripe fruit	Harvest interval	Yield (kg)[v]
				1996				
Chanticleer	1.77 ± 0.45	31	136	12.4	0.35	<21 June	21 June–8 July	0.64 a[t]
Weymouth	1.50 ± 0.37	22	128	12.2	0.60	23 June	21 June–8 July	0.64 a
Duke	2.06 ± 0.37	30	151	10.7	0.40	27 June	21 June–8 July	2.05 b
Bluecrop	1.96 ± 0.42	25	113	11.7	0.65	10 July	8 July–5 Aug.	1.55 b
				1997				
Chanticleer	1.74 ± 0.33	27	149	12.0	0.76	22 June	20 June–27 June	1.11 a´
Weymouth	1.68 ± 0.38	24	125	11.3	0.94	24 June	20 June–7 July	0.81 a´
Duke	1.78 ± 0.48	26	153	9.9	0.54	30 June	20 June–15 July	2.82 b´
Bluecrop	1.85 ± 0.46	28	110	11.3	0.80	14 July	11 July–28 July	3.67 b´
				1998				
Chanticleer	1.87 ± 0.42	27	141	11.5	0.51	11 June	16 June–29 June	3.17[u]
Weymouth	1.61 ± 0.38	21	126	9.4	0.54	17 June	16 June–29 June	3.73
Duke	2.07 ± 0.57	26	134	10.1	0.49	19 June	16 June–6 July	6.34
Bluecrop	1.84 ± 0.44	27	126	10.6	0.80	4 July	24 June–21 July	5.40
				1996–98 Averages[t]				
Chanticleer	1.79 ab	28 a	142 a	12.0	0.54	18 June a[s]	---	---
Weymouth	1.60 b	22 b	126 b	11.0	0.69	21 June b	---	---
Duke	1.97 a	27 a	146 a	10.2	0.48	25 June c	---	---
Bluecrop	1.88 a	27 a	116 b	11.2	0.75	11 July d	---	---

[z]Weighted averages based upon the percentages of total yield at each harvest. Evaluations were made on samples composited from each of the four replicates harvested.
[y]Based on 30 individually weighed fruit sampled at each harvest.
[x]Color in the L*a*b* color coordinate system as defined by the Commission Internationale l'Eclairage (CIE). L coordinate indicates lightness; higher numbers indicate lighter color. Color meter aperature, 50 mm.
[w]Grams of force needed to produce 1 mm of deflection, averaged across 30 fruit.
[v]Values based on four replicates of five plants each.
[u]In 1998, two replicates of 'Chanticleer' were heavily pruned to provide propagation material, hence, only two replicates of each cultivar were harvested.
[t]Mean separation within years by LSD, $P \leq 0.05$. Absence of letters indicated that differences were not statistically significant.
[s]The values were standardized prior to statistical analysis by setting the ripening date for 'Chanticleer' equal to 1, and calculating other cultivars ripeness by relative difference; in 1996 the 50% ripe date for 'Chanticleer' was taken as 20 June.

Table 3. Percentages of sound fruit in 'Chanticleer', 'Weymouth', 'Duke', and 'Sunrise' after 1 week of storage at 5, 10, or 21 °C, across all harvests for 1995–97. Hammonton, N.J.

	Sound fruit (%)[z]											
	1995			1996			1997			1995–97 Avg[y]		
	5 °C	10 °C	21 °C	5 °C	10 °C	21 °C	5 °C	10 °C	21 °C	5 °C	10 °C	21 °C
Chanticleer	96	82	45	93	67	41	90	88	71	93 ab	79 abc	52 d
Weymouth	92	62	5	69	38	34	71	62	50	77 bc	54 d	30 e
Duke	100	100	85	97	96	66	99	98	96	99 a	98 a	82 abc
Sunrise	100	97	73	97	95	65	93	93	78	97 ab	95 ab	72 cd

[z]Fruit with no signs of decay or physiological breakdown. Each value represents the data for the fruit contained in a full clamshell package.
[y]Mean separation across all cultivars and storage temperatures by LSD, $P \leq 0.05$.

does not flower as late as either 'Duke' or 'Sunrise'. Observations of percentage of open flowers during the first week of May at Hammonton in 1995–97 showed average values of 36%, 67%, 11%, and 6% for 'Chanticleer', 'Weymouth', 'Duke', and 'Sunrise', respectively. Studies in New Jersey have shown that 'Chanticleer' is resistant to mummy berry blight caused by the fungus *Monilinia vaccinii-corymbosi* Reade (Honey) and has average resistance to the secondary, fruit-infection stage (unpublished data). Screening in North Carolina has shown 'Chanticleer' to be relatively resistant to stem blight caused by *Botryosphaeria dothidea* (Mouq. ex Fr.) Les and de Not (J. Ballington, personal communication), but blighting has been observed in New Jersey on some younger plantings. 'Chanticleer' has been a consistently good performer in N.J., producing reliable yields, but has been more variable in other regions, producing low to moderate yields for trials conducted in Michigan, Arkansas, Oregon, and North Carolina. 'Chanticleer' is recommended as an early season cultivar primarily for commercial growers in northeastern temperate regions, including New Jersey and adjoining states.

Availability

Plants of 'Chanticleer' have been distributed to commercial propagators; neither the USDA nor NJAES currently has plants for distribution. Growers may request information on how to obtain propagations by contacting M.K. Ehlenfeldt, USDA-ARS Blueberry & Cranberry Research Center, 125A Lake Oswego Road, Chatsworth, NJ 08019. Genetic material of this release has been deposited in the National Plant Germplasm System where it will be available for research purposes.

Literature Cited

Draper, A.D., G.J. Galletta, N. Vorsa, and G. Jelenkovic. 1991. 'Sunrise' highbush blueberry. HortScience 26:317–318.