'Encore' Floricane Raspberry

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'Encore' is a new floricane fruiting red raspberry (*Rubus idaeus* L., Rosaceae Juss.) developed by Cornell University at the New York State Agricultural Experiment Station in Geneva, N.Y. Summer harvest of red raspberry generally peaks in mid-July in the East Coast and Great Lakes growing regions, creating a considerable gap before harvest of primocane fruiting raspberries in mid-August (Pritts and Handley, 1989).). 'Encore' is noted for having a very late floricane (summer) crop, maturing a high percentage of fruit from late July to early August in these areas, thus extending summer harvest and decreasing the gap between the summer and fall (primocane-fruiting) harvest seasons. This makes 'Encore' the latest fruiting floricane cultivar adapted for this region.

'Encore' has performed consistently for late summer production over many years of testing. It compared favorably to 'Taylor' (the traditional late cultivar in this region), 'Titan' (the leading late, large-fruited cultivar), and 'Canby' (parent) in replicated trials. 'Encore' produces large, attractive, conic fruit with a firmer texture than 'Taylor' and 'Canby'. The flavor is good, mild, and balanced and is superior to the late season 'Titan'. Fruit are easy to harvest, dry to the touch, and well suited for wholesale packaging and distribution.

Fig. 1. Pedigree of 'Encore' raspberry.

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at the Experiment Station in Geneva. 'Encore' was one of 12 selections made in 1980 from a seedling population of 206 progeny from this cross and was assigned the designation NY7. 'Encore' has been evaluated at multiple sites on the Geneva station since 1987 for fruit and growth characteristics and general adaptability. Virus-free nursery material was first available for replicated yield trials in 1993 after indexing and propagation.

After the 1997 season, NY7 was slated for release in 1998 because of its late harvest season, large, attractive fruit and mild, well balanced flavor. The name 'Encore' was chosen to compliment early season 'Prelude' (also released in 1998 from Cornell University) as an indicator of their fruiting seasons (late and early, respectively). A U.S. plant patent was applied for in October 1998 and was granted on 23 Jan. 2001 (US PP11,746).

Description and Performance

'Encore' produces nearly spineless canes,

similar to its 'Canby' parent (Waldo, 1953) with short, downward-pointing spines present mainly at the cane base. It is exclusively floricane fruiting and produces sufficient cane density to maintain high annual yields without the need for extreme cane thinning during the dormant season to reach the recommended 30 to 50 canes/m². Canes are sturdy with an average floricane height of 1.4 m, which have displayed consistently good winter hardiness in zone 5 (minimum temperature range of –23.4 to –26.2 °C). Plant vigor is very good compared to other standard cultivars. The canes do not require trellising, although they are very productive and have long fruiting laterals that benefit from trellis support for improved harvest efficiency.

Mature foliage of 'Encore' is dark green with a coarse upper surface and noticeable ridges, while actively growing terminals are light green. The leaf margins have double serrations that are larger than those of 'Taylor' but not notched like those of 'Tulameen' (Daubney and Anderson, 1991) nor as distinctly pointed as those of 'Titan' (Sanford et al., 1985). Leaves are predominantly trifoliate with no petiolules on the lateral leaflets. There are two straight stipules at the leaf base and the leaf cross-section is convex.

The average harvest period for 'Encore' over from 1994 to 1997 at Geneva was 11 July to 7 Aug. On average, 49% of the crop matured after 23 July 23. The average total yield of 'Encore' was equal to 'Taylor' and 'Canby' but less than 'Titan' (Table 1) in plots

Table 1. Mean yield for four late season floricane fruiting raspberry cultivars in Geneva, N.Y., from 1995–97.

Cultivar	Total yield ² (kg·ha ⁻¹)			
	1995	1996	1997	Mean ³
Encore	8,838	8,046	9,852	8,912 b
Canby	8,152	11,342	3,435	7,643 b
Taylor	7,812	6,982	9,697	8,164 b
Titan	9,272	15,061	8,928	11,087 a

²Yields were extrapolated from five 5-m plots planted at a density of 3590 plants/ha.

³Numbers followed by the same letter are not significantly different at $P \leq 0.05$ according to Duncan's multiple range test.

Table 2. Mean fruit weight for four floricane fruiting raspberry cultivars in Geneva, N.Y., over three seasons.

Cultivar	Avg fruit size ² (g)			
	1995	1996	1997	Mean ³
Encore	2.8	3.0	2.8	2.9 a
Canby	2.2	2.2	2.0	2.1 b
Taylor	2.0	2.1	2.0	2.0 b
Titan	3.0	3.1	2.8	3.0 a

²All unblemished fruit was weighed throughout each season.

³Numbers followed by the same letter are not significantly different at $P \leq 0.05$ according to Duncan's multiple range test.

Table 3. Mean juice soluble solids, titratable acidity, and pH for four floricane fruiting raspberry cultivars from 1995–97 in Geneva, N.Y.

Cultivar	Total soluble solids (%)			Titratable acidity (% citric acid)			pH		
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
Encore	9.9	9.0	13.4	2.05	1.55	2.30	3.10	2.95	3.35
Canby	11.5	10.1	13.8	1.38	1.09	1.75	3.28	3.10	3.40
Taylor	11.0	10.0	14.4	2.08	1.91	2.36	3.10	3.00	3.30
Titan	9.0	7.8	10.6	1.92	1.69	2.40	3.20	3.15	3.30

CULTIVAR AND GERMPLASM RELEASES

established in a Honeoye fine sandy loam soil typical of the region. ‘Encore’ yields averaged 8,912 kg·ha⁻¹ over three seasons compared to 7,643 kg·ha⁻¹ for ‘Canby’ (Table 1). Yields were extrapolated from 5-m plots in a completely randomized design with five replications with 3-m row centers and 1-m initial within row plant spacing (3590 plants/ha). Natural precipitation was supplemented with drip irrigation at a rate equivalent to 1 inch/week [0.62 gal/ft² (25.2 L·m⁻²)] within the row in the establishment year and 1.75 inches/week [1.09 gal/ft² (44.1 L·m⁻²)] during the fruiting seasons. Fertilization and pest control were based on recommended practices for the East Coast growing region (Pritts and Handley, 1989). A double-T trellis was used for support of fruiting canes (Pritts and Handley, 1989).

The season average fruit weight of ‘Encore’ was greater than ‘Canby’ and ‘Taylor’ and only slightly less than ‘Titan’ (‘Titan’ has the largest fruit weight potential of all cultivars adapted for the East Coast and Great Lakes growing regions (Sanford et al., 1985) (Table 2). ‘Encore’ berries have averaged 2.9 g/berry through three harvest seasons, with the average ranging from 2.8 to 3.0 g (Table 2). The berries are conic, firm, and dry to the touch when harvested. Fruit are easy to harvest, handle

well, and are suitable for u-pick, retail, and wholesale markets.

‘Encore’ is outstanding for its ability to maintain large fruit weight over the entire harvest season. The average fruit weight of ‘Encore’ after 23 July was 2.9 g/berry. ‘Taylor’ had similar maturity compared with ‘Encore’, maturing 47% of its crop after 23 July, but had lower overall yields (Table 1) and smaller average berry size after 23 July (1.9 g).

‘Encore’ is distinctly later maturing than ‘Titan’ with similar fruit size (Table 2) while being more attractive and better flavored. It had higher soluble solids (sugars) than ‘Titan’ but lower than ‘Taylor’ and ‘Canby’ (Table 3). Titratable acidity of ‘Encore’ was higher than that of ‘Titan’ and ‘Canby’ but lower than that of ‘Taylor’ (Table 3). The pH of the juice of ‘Encore’ was lower than ‘Canby’ and ‘Titan’ and equal to ‘Taylor’ (Table 3).

‘Encore’ is not highly resistant or susceptible to most raspberry pests in the Northeast. It is less susceptible than ‘Taylor’ to raspberry leaf spot disease caused by the fungus *Sphaerulina rubi* Dem. and Wilc. ‘Encore’ shows intermediate resistance to root rot caused by *Phytophthora fragariae* var. *rubi* Wilcox and Duncan, being more resistant than ‘Titan’ but less resistant than ‘Latham’ (Maloney et al. 1993).

Availability

‘Encore’ has been licensed to commercial nurseries in North America, which are listed at the Cornell Fruit Web page (<http://www.hort.cornell.edu/nursery/>). Nonexclusive licensing arrangements can be made through the Cornell Research Foundation, Inc., 20 Thornwood Drive, Suite 105, Ithaca, N.Y. 14850.

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