Yield Potentials of Thornless Blackberry Cultivars in Maryland

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In 1966, the 'Smoothstem' and 'Thornfree' thornless blackberry cultivars were introduced and distributed to nurseries for propagation. Interest is increasing in them because of their thornless plants, moderate winter hardiness, high fruit production, and intense flavor. Since the plants do not sucker, it is easy to maintain them in a hill system.

At the time 'Smoothstem' and 'Thornfree' were introduced, four thornless selections were candidates for introduction. They had been propagated in 1964 and planted in replicated plots in 1965 for further evaluation. Comparisons are given in this report on the two named varieties and the four selections (Tables 1, 2, 3).

Plants were set in April 1965 on a Keeport fine sandy loam of low fertility with propagations that were tip-rooted in the fall of 1964. Plants were spaced 4 feet apart in rows eight feet apart with five plants per plot and four replications. A two-wire trellis with wires at 2½ and 4½ feet heights was used to support the semi-upright canes. Irrigation was used only during prolonged dry periods at harvest time. The plants received ¼ pound of 5-10-5 fertilizer each, the first year in early June. Thereafter 800 pounds per acre

Table 1. Yields of thornless blackberry cultivars, Maryland, 1967-1971.

Cultivars	Yields in lbs/acre 1967	1968	1969	1970	1971	Mean
Smoothstem	5,663 bc[1]	7,235 bc	17,176 a	21,967 a	12,630 a	12,934
Thornfree	9,529 a	12,890 a	17,013 a	17,475 b	13,937 a	14,169
US 1492	8,304 ab	11,450 a	15,652 a	15,379 bc	15,216 a	13,200
US 1513	4,029 c	6,580 c	10,371 b	12,303 c	9,745 a	8,606
US 1523	6,153 bc	10,200 ab	12,848 ab	14,617 bc	13,066 a	11,377
US 1526	5,990 bc	12,565 a	17,366 a	16,141 bc	13,637 a	13,140

[1]Duncan's multiple range test. Values within years that have different letters are significantly diffeffrent at the 5 percent level.

Table 2. Fruit weights of thornless blackberry cultivars, 1967-1971.

Cultivar	Fruit weights in gms/25 berries 1967	1968	1969	1970	1971	Mean
Smoothstem	114 b[1]	112 cd	105 c	104 c	121 bc	111
Thornfree	124 b	117 bc	113 c	112 c	118 bc	117
US 1492	114 b	117 bc	114 bc	114 bc	125 bc	117
US 1513	136 a	138 a	135 a	131 a	128 ab	134
US 1523	97 c	103 d	102 c	109 c	112 c	105
US 1526	124 b	123 b	125 ab	125 ab	138 a	127

[1]Duncan's multiple range test. Values within years that have different letters are significantly different at the 5 percent level.

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Table 3. Dates of ripening of blackberry cultivars, 1967-1971.

Cultivar	1967	1968	1969	1970	1971	Mean 1968-1971
Smoothstem	8/8[1]	7/31	8/1	8/3	8/2	8/2
Thornfree	7/30	7/24	7/24	7/25	7/27	7/25
US 1492	7/28	7/22	7/18	7/22	7/24	7/22
US 1513	8/3	7/28	7/27	7/26	7/26	7/27
US 1523	7/29	7/20	7/18	7/21	7/24	7/22
US 1526	8/6	7/31	7/31	7/30	7/30	7/31

[1]Dates are estimates of when 10 percent of the crop was first ripe for each cultivar as indicated by fruit weight per picking date.

of 5-10-5 was broadcast in mid April. Three or four canes, 5 to 6 feet long, with lateral branches 8 to 10 inches long, were retained in each hill for fruiting. Fruit was harvested on a three to four-day schedule. Plot yields were recorded by weight, and fruit size was determined by weighing 25 berries per plot at each picking.

The first yields were recorded in 1967, three years after planting; and 'Thornfree', with more than 4½ tons per acre, outyielded all other cultivars (Table 1). Yields increased in 1968, and again in 1969, for all cultivars, as the plants matured in size. Yields were heavy in 1970, with 'Smoothstem' yielding nearly 11 tons per acre, followed by a decline in 1971 for all cultivars. Mean yields during the five-year period for four of the six cultivars were 6½ to 7 tons per acre, which is considerably more than is usually obtained from other blackberry cultivars under similar conditions. In the breeding and selection for the thornless canes, a character for high production has been obtained.

Fruit weights were consistent during the five years for each cultivar, with US 1513 the largest, and US 1523 the smallest (Table 2). 'Smoothstem', 'Thornfree', and US 1492 did not differ significantly in fruit weight. Fruit size was maintained throughout the season in all cultivars.

Fruit ripening began in late July or early August, about four weeks later than 'Bailey' and 'Darrow'. The date when 10 percent of the crop was ripe was estimated by determining the quantity of fruit harvested during the first one or two pickings in each plot. After the first year, the cultivars were consistent in sequence of ripening, and relatively consistent in date of ripening (Table 3). US 1492 and US 1523 averaged three days earlier than 'Thornfree', and 'Thornfree' was eight days earlier than 'Smoothstem'. Each cultivar was picked eight to ten times each season at three- or four-day intervals.

In summary, relatively high yields of 6½ to 7 tons of fruit per acre were obtained with 'Smoothstem' and 'Thornfree', in a comparison with four other thornless blackberry cultivars over a 5-year period. None of the unnamed selections was superior to 'Smoothstem' and 'Thornfree'. 'Smoothstem' and 'Thornfree' appear to be attracting interest in areas where they are not subject to winter injury. They are generally winter hardy south of the Mason-Dixon Line and westward to Missouri and Arkansas. 'Thornfree' is more winter hardy than 'Smoothstem', but 'Smoothstem' is more vigorous. Both grow vigorously in southeastern United States and the Gulf Coast area, but the plants are not as productive as they are farther north.