

Post Harvest Fruit Quality of Primeark 45 and Primeark Freedom Blackberries from 2014 Coastal California Production

***Mark Gaskell, Farm Advisor
UC Cooperative Extension – San Luis Obispo, CA.***

Primocane fruiting cultivars are rapidly transforming California fresh market blackberry production. The Prime-Ark 45 variety has become the variety of choice for open field and high tunnel production because of its long production season coupled with high yields, flexible pruning management, and good fruit quality. On the central California coast, Prime-Ark 45 can be managed to produce from at least July 1 to December 15 in a typical season; a period that fills much of the market window when little fruit is arriving from competing production areas in Mexico.

A newer cultivar of primocane fruiting blackberries – Prime-Ark Freedom – was released by the U. of Arkansas in 2013 and it also offers thorn-free vegetative canes in addition to the other attractive characteristics of the Prime-Ark 45 cultivar. The thorn-free trait would be attractive for ease of pruning and harvest management and possibly also might be beneficial for U-Pik operations.

Initial reports from Arkansas trials have indicated high yields of good quality fruit was possible with the Prime-Ark Freedom but that the harvested fruit while having good flavor, appearance, and size, may be somewhat softer than the Prime-Ark 45 and may not hold up as well in transit or storage. This fruit quality comparison was conducted to compare fruit quality from coastal California production to those initial reports from Arkansas to provide growers with up to date information comparing production and fruit quality of the two cultivars.

An initial trial planting of 100 plants of the Prime-Ark Freedom was planted on a commercial berry farm in Nipomo, California (Latitude 35.013132; Longitude - 120.456837) on March 12, of 2014. The planting was established from 8 week-old transplants from tissue culture. Several rows Prime-Ark 45 plants were simultaneously planted beside the 2 rows of PA Freedom. These trial rows were established as part of a larger commercial PA 45 blackberry planting and throughout the season, received similar irrigation, fertilization and other cultural practices as the commercial planting.

Initial flowering of the PA 45 began in early September, 7-10 days earlier than the PA Freedom. The fruit for this evaluation was harvested on October 17, 2014 and preceded the PA Freedom by 7-10 days. Fruit was picked by commercial picking crews and packed into 6 oz. clamshells as part of a normal picking and packing operation. Six clamshells of each cultivar were then randomly selected and transported to the laboratory in a cooler with ice packs for subsequent fruit quality evaluations.

Four replicates of 10 fruits were randomly selected from the 6 clamshells and weighed, measured with a millimeter micrometer, and the samples were then crushed and the juice measured for % Brix and pH using standard laboratory procedures. Total titratable acidity (TA) was determined by titrating a known volume of fruit juice with 0.1 N NaOH until pH reached 8.2. The milliliters of NaOH required were used to calculate TA, which is expressed as percentage of citric acid. The sugar acid ratio was calculated based on Brix and TA. Previous studies have suggested that a ratio of 10 or greater best match flavor expectations of consumers. Whole fruit were subjected to a firmness evaluation using a Universal Penetrometer firmness tester that measured 0.1mm depressions when fruit is subjected to 100 g. for 5 seconds. Results are presented in the following table.

Cultivar	Fruit Wgt (g)	Fruit Length (mm)	Brix (%)	pH	Titratable Acidity (g/L)	Sugar/Acid Ratio	Firmness (0.1mm 100g/5 sec.)
PA 45	5.96	27	9.7	2.86	1.62	9.74	24
Freedom	11.09	33	8.6	2.91	1.57	8.74	16
ANOVA F	**	**	**	ns	ns	ns	**

Overall, the fruit of the PA Freedom was larger and heavier but was not as firm as the PA 45. The PA Freedom was also somewhat lower in Brix than the PA 45 but other fruit quality characteristics were not significantly different. The differences in fruit firmness had been reported also for these two cultivars from earlier trials in Arkansas. The PA Freedom fruit was markedly larger in this sampling and it is possible that the differences in firmness may be related to differences in fruit size. PA 45 in production from more mature plantings typically has fruit averaging 7-9 grams. This fruit quality comparison is from the initial production from primocanes planted earlier in the season and the differences represent fruit quality from more mature plantings.

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