such as CN7, CN8, CN15 and possibly CN6 are of interest (Table 5).

In summary, the prospect of the strong strawberry industry of California continuing to flourish is very bright.

Table 5. Performance of winter planted day-neutral selections at Watsonville during 1976-77.

Item	G/P1 Yield by Periods Ending				Total		Size
	5/20	6/30	8/10	9/6	G/P1	T/A*	G/Fr
CN6	88	270	514	172	1043	40	17.7
CN7	78	590	619	113	1400	54	17.3
CN8	158	452	750	176	1535	59	22.4
CN15	56	414	512	159	1141	44	18.8

*34,848 plants/acre

Highbush Blueberry Cultivars

A. D. DRAPER[1]

About 1911, Dr. F. V. Coville of USDA began a series of crosses among six native selections of three *Vaccinium* species (*V. australe, V. corymbosum,* and *V. angustifolium*) that led to the release of the first highbush blueberry cultivar, Pioneer, in 1920. One wild selection, Rubel, and at least 55 cultivars from U. S. Department of Agriculture, State Agricultural Experiment Stations, and private breeders have since been propagated and distributed to growers. Highbush blueberry cultivars released by public agencies since 1960 are shown in Table 1. Some of the older blueberry cultivars (Greenfield, Redskin, and Catawba) were not distributed widely and disappeared soon after being introduced. Others (Jersey, Weymouth, Rubel, and Rancocas), because of disease resistance, plant vigor and habit, high production, and suitability for machine harvesting have remained in production. Other factors in determining popularity of cultivars are fruit quality, season of ripening, and resistance of fruit to breakdown. Cultivars also differ in areas of adaptation; some, such as Bluecrop, are much more widely adapted than others. Winter hardiness, number of chilling hours required for bud growth, heat tolerance, and soil requirements of cultivars are important in determining areas of adaptation.

In northern Florida and areas along the Gulfcoast low-chilling cultivars (less than 800 hours below 7°C) are required for consistent yearly production, three highbush varieties, Flordablue, Sharpblue, and Avonblue are grown.

In North Carolina, cane canker is a serious fungal pest of blueberry and in order for a planting to persist, it must be resistant or be vigorous enough to quickly replace canes that

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Table 1. Highbush blueberry varieties originated by public agencies since 1960.

Variety	Year Introduced	Parentage	Originating Agencies
Morrow	1964	Angola x Adams	USDA and NC AES
Darrow	1965	F-72 x Bluecrop	USDA and NJ AES
Elizabeth	1966	(Katharine x Jersey) x Scammell	New Jersey Blueberry Variety Council
Bluehaven	1967	Berkeley x Michigan 19-H (Mich. Lowbush 1 x HBS 120)	Mich. AES
Bluetta	1967	No. 3 (North Sedgwick lowbush) x Coville	USDA and NJ AES
Lateblue	1967	Herbert x Coville	USDA and NJ AES
Northland	1967	Berkeley x Michigan 19-H (Mich. Lowbush 1 x HBS 120)	Mich. AES
Meader	1971	Earliblue x Bluecrop	NH AES
Elliott	1973	Burlington x US 1 (Dixi [Jersey x Pioneer])	USDA
Harrison	1974	Croatan x US 11-93 (GM 37 x CU 5)	NC AES and USDA
Flordablue	1975	Fla 63-29 x Fla 63-12	Fla AES
Sharpblue	1975	Fla 61-5 x Fla 62-4	Fla AES
Patriot	1976	US 3 (Dixi x Michigan Lowbush 1) x Earliblue	USDA and Me AES
Avonblue	1977	E-66 x Fla 61-3	Fla AES
Spartan	1977	Earliblue x US 11-93 (GM 37 x CU 5)	USDA

are killed. Resistant cultivars vary in resistance to races of the fungus. For this reason, Croatan which has broader resistance than Wolcott, is now the leading cultivar. Earlier, Wolcott was considered to be resistant, but is now considered to be susceptible due to shifts in strains of the fungus. These two are followed by Murphy and a small amount of Morrow. Angola has practically disappeared from production. The two most widely grown susceptible cultivars are Jersey and Blueray. Two new cultivars, Harrison and Bluechip, are cane-canker resistant, large fruited, productive and are similar to Murphy in time of ripening.

In New Jersey, harvesting by machine has influenced the cultivars in new plantings. Bluecrop, which harvests reasonably well mechanically and is productive, is now the leading cultivar. It has replaced acreages of older cultivars which are not consistently productive or do not pick well mechanically, such as Coville, Concord, Berkeley and June. Even the once popular Blueray is fading out because Bluecrop picks better by machine and because Blueray is very susceptible to red ringspot virus. Older plantings of Weymouth, the standard early variety for many years, are still productive and have not been replaced by either Earliblue or Bluetta. Both have better flavor than Weymouth, but Earliblue is not consistently productive and though Bluetta is productive, growers do not like its

low-growing bush habit. Older cultivars which harvest well by machine, such as Jersey and Burlington are still being planted. There appears to be increasing interest in Collins, a second early sort, because of its machining capabilities and good quality.

New cultivars, Patriot and Elliott, are being tried; Patriot, for early fresh fruit, and Elliott, for very late fruit for mechanical harvesting and processing.

In Michigan, about 65% of the fruit is for processing and most fields are picked mechanically. Jersey is by far the leading variety. The next two cultivars in acreage planted are Rubel and Bluecrop. However, Rubel is no longer being planted. Bluecrop will, in the next few years, be second to Jersey in acreage. Bluehaven and Northland have not been widely planted. New varieties being planted are Spartan and Elliott. Spartan is a second early cultivar that is productive, has good fruit quality and can be harvested by machine. It gives Michigan growers a cultivar that yields fruit suitable for fresh or processing sales. Trial plantings of the new Bluejay will be set in the next few years. It has a good bush and fruit that can be picked by hand or machine.

In Washington, Bluecrop is being planted heavily. Some Blueray and Bluetta are increasing, though Bluetta does not hold up well during rainy periods which often occur. Collins is not being widely planted because of field losses of plants after planting. Older cultivars which are being planted primarily because of adaptability to machine harvest are Rancocas, Pemberton, Berkeley, Dixi, Jersey, Rubel, and 1613-A. New cultivars Patriot, Spartan, and Elliott are being propagated for trial plantings. Bluehaven and Northland are also being tried.

In Oregon, the leading cultivar in plant sales for the past few years has been Bluecrop. Last year Bluecrop was followed by Collins, Washington, and Olympia. Other varieties being planted are Bluetta, Earliblue, Burlington, Jersey, Rubel, Laniera (N-51-G), and 1613-A.

In Arkansas, the blueberry industry is very young. Most of the Arkansas fruit enters fresh fruit markets and initial plantings were made of cultivars with high quality. Blueray is the leading variety followed by Collins, Coville and Bluecrop. Some growers are beginning to use machines for picking and therefore Bluecrop and Coville are being planted for that purpose.

In British Columbia, 10 years ago Rancocas occupied almost one-fourth of the acreage, followed by Bluecrop, Dixi, Jersey, Weymouth, Rubel, Pemberton, June, Concord, and Stanley in descending order. Since then, Bluecrop has been planted three times more than any other cultivar and now occupies the largest acreage. Rancocas, Stanley, Pemberton, Jersey, June, Weymouth, Coville, and Dixi, were planted in addition to the Bluecrop. There is interest in newer varieties such as Northland, Spartan, and Bluejay, but planting stock is scarce and they have not been adequately tested in Canada.

In general, the cultivars that have continued to be planted are those that are productive and that can be either hand or machine harvested. All blueberry-growing areas desire productive early cultivars that produce high-quality fruit that can be machine harvested.