Blueberry Cultivars of North America

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Summary. The blueberry cultivar situation in North America is undergoing rapid change. Attempts to grow blueberries in non-traditional areas, and increased biotic and abiotic challenges in traditional production areas, are fueling the search for superior, adapted cultivars. This survey of all blueberry-producing states/provinces in the United States and Canada provides the current status and projected trends in blueberry cultivar use in North America. Most (86%) of current hectareage is comprised of 25 northern highbush, 10 rabbiteye, and two southern highbush cultivars. 'Bluecrop' is the dominant northern highbush cultivar, with 35% of the highbush area, while 'Tifblue' occupies 40% of the rabbiteye area. Some historically important cultivars, such as 'Jersey', 'Weymouth', and 'Woodard' are in decline. New cultivars of all blueberry types are beginning to have a positive impact on the blueberry industry.

Data were collected on blueberry cultivars grown in the United States and Canada as part of a 1992 comprehensive survey questionnaire on the blueberry industry of North America (Moore, 1993). Information on cultivars was received from 35 states and four Canadian provinces. All major blueberry-producing states and provinces responded; therefore, the data reported herein can be considered to be essentially complete for the commercial cultivated blueberry industry.

Recent surveys of northern highbush (*Vaccinium corymbosum* L.) (Hanson and Hancock, 1990), rabbiteye (*V. ashei* Reade) (Spiers, 1990), half-high (*V. corymbosum* × *V. angustifolium*) (Finn et al., 1990), and low-chill highbush (mixed parentage) (Lyrene, 1990) cultivars have been published. Generally, the results of the present survey agree with those reports, although newly released cultivars now are beginning to have an impact and new trends in cultivar use by the blueberry industry are beginning to appear. This report provides the current blueberry cultivar situation in each producing state and province in the United States and Canada.

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Respondents were asked to estimate the current blueberry production area in their state/province, list the five most popular cultivars with the percentage of area planted to each, and to indicate whether each cultivar was increasing, decreasing, or stable in popularity. A total of 25 northern highbush (including five half-high cultivars), 10 rabbiteye, and two southern highbush cultivars were reported in the survey. The listed cultivars account for 86% of the cultivated blueberry hectareage in North America.

The hectareage of cultivated blueberries in each state and province and the major cultivars being grown are shown in Table 1. As expected, there is a wide diversity of cul-

vars depending on geographic location. The more cold-hardy northern highbush (*Vaccinium corymbosum* L.) cultivars are predominant in the northern United States and Canada, while rabbiteye (*V. ashei* Reade) cultivars are found in several southern states. Minnesota hectareage is planted exclusively to half-high blueberries, and new southern highbush (low-chill highbush) cultivars are emerging in several southern states.

The area planted to each cultivar and the current trend in cultivar popularity is shown in Table 2. A striking feature of this table is the dominance of 'Bluecrop' in northern highbush blueberry production. 'Bluecrop' occupies 35% of the northern highbush area

Table 1. Major blueberry cultivars in states/provinces in the United States and Canada.

State or province	Production area (ha)	Major cultivars*
Alabama	195	Tifblue (60,I); Climax (20,D), Premier (10,I); Brightwell (5,I); Woodard (5,D)
Arkansas	524	Bluecrop (70,I); Collins (12,D); Bluejay (8,I); Blueray (5,S); Elliott (5,S)
Connecticut	81	Blueray (20,S); Berkeley (17,D); Bluecrop (15,I); Collins (11,S); Bluetta (4,D)
Delaware	26	Blueray (S); Earliblue (S); Bluecrop (S); Bluetta (S)
Florida	853	Sharpblue (25,I); Climax (20,S); Beckyblue (10,D); Aliceblue (10,D); Powderblue (10,I)
Georgia	1668	Tifblue (44,S); Climax (24,I); Woodard (8,D); Brightwell (7,I); Delite (2,D)
Idaho	40	Bluecrop; Blueray; Northland; Patriot; Earliblue
Illinois	81	Earliblue (D); Jersey (D); Bluecrop (S); Blueray (S); Elliott (I)
Indiana	304	Jersey (37,D); Bluecrop (23,S); Blueray (13,S); Berkeley (6,D); Coville (4,D)
Iowa	2	Patriot (33,I); Blueray (33,I); Northblue (33,I)
Kansas	3	Bluecrop (35,S); Blueray (30,S); Collins (25,S); Patriot (8,S); Northsky (2,S)
Kentucky	18	Earliblue (30,D); Blueray (30,S); Berkeley (15,S); Darrow (10,S); Patriot (5,D)
Louisiana	163	Tifblue (60,S); Climax (25,S); Premier (5,S); Brightwell (5,I); Woodard (2,D)
Maryland	65	Bluecrop (50,S); Blueray (10,S); Earliblue (10,I); Spartan (10,I); Elliott (10,I)
Massachusetts	304	Bluecrop (33,I); Berkeley (25,S); Earliblue (10,D); Blueray (10,S); Coville (10,S)
Michigan	6885	Jersey (40,D); Bluecrop (30,I); Rubel (8,D); Elliott (7,I); Blueray (4,S)
Minnesota	32	Northblue (80,I); Northcountry (15,S); St. Cloud (4,I); Northsky (1,D)
Mississippi	450	Tifblue (40,D); Premier (20,I); Brightwell (20,I); Climax (10,D)
Missouri	122	Bluecrop (30,S); Blueray (30,S); Collins (15,D); Patriot (10,I); Elliott (8,I)
Nebraska	1	Bluecrop; Blueray; Jersey; Patriot; Spartan
New Hampshire	664	Bluecrop (20,D); Blueray (20,S); Patriot (15,I); Northland (15,S); Earliblue (15,D)
New Jersey	3321	Bluecrop (50,S); Weymouth (30,D); Bluetta (10,D); Duke (5,I); Elliott (5,S)
New York	486	Bluecrop (40,I); Blueray (20,I); Patriot (20,I); Berkeley (10,S); Jersey (5,D)
North Carolina	1580	Croatan (60,S); Murphy (6,D); New Murphy (5,D); Tifblue (5,S); O'Neal (4,I)
Ohio	113	Coville (25,D); Berkeley (20,I); Bluecrop (15,I); Collins (10,D); Jersey (10,D)
Oklahoma	81	Bluecrop (30,D); Blueray (30,D)
Oregon	668	Bluecrop (30,I); Berkeley (25,I); Earliblue (7,D); Jersey (7,D)
Pennsylvania	202	Bluecrop (S); Patriot (I); Spartan (I); Elliott (S); Blueray (S)
South Carolina	159	Tifblue (50,D); Climax (20,I); Woodard (5,S); Premier (5,S); Delite (5,D)
Tennessee	73	Tifblue (60,I); Climax (20,I); Woodard (5,D); Homebell (1,D)
Texas	526	Tifblue (50,S); Climax (25,I); Brightwell (10,I); Delite (10,D); Premier (5,S)
Vermont	40	Bluecrop (S); Berkeley (S); Coville (S); Herbert (S)
Virginia	85	Bluecrop (30,I); Premier (8,I); Powderblue (8,I); Blueray (5,S); Collins (5,D)
Washington	486	Bluecrop (25,S); Jersey (15,S); Berkeley (10,S); 1613A (10,I); Blueray (5,D)
Wisconsin	2	Northblue (I); Northcountry (I); Northsky (I); Friendship (I); Patriot (I)
Canada		
British Columbia	1822	Bluecrop (50,I)
Nova Scotia	71	Coville (21,S); Bluecrop (17,S); Jersey (13,S); Berkeley (13,S); Blueray (10,S)
Ontario	263	Bluecrop (70,I); Northland (10,D); Elliott (5,I); Berkeley (5,D); Blueray (5,D)
Quebec	81	Patriot (I); Blueray (S); Bluecrop (S); Berkeley (D); Northland (D)

*Parentheses following cultivar name show percent of area occupied by the cultivar, and whether the cultivar is increasing (I), stable (S), or decreasing (D) in popularity.

and is expected to increase (10 states) or remain stable (12 states) in all reporting states but two. In contrast, 'Jersey' and 'Weymouth', the second- and third-most-planted highbush cultivars, are in decline. Previously, Hanson and Hancock (1990) reported that 'Bluecrop' occupied 32.4% of the highbush blueberry hectareage worldwide, while 'Jersey' and 'Weymouth' were planted on 18.7% and 6.0% of highbush hectareage, respectively. Another notable feature of 'Bluecrop' is its listing as a "top 5" cultivar in 26 states and provinces, ranging from Arkansas in the southern United

States, north to the Canadian provinces, and west to Oregon and Washington. This wide popularity indicates broad climatic and edaphic adaptation of 'Bluecrop'.

The fourth-leading highbush in hectareage, 'Croatan', was listed by only one state, North Carolina, and its hectareage is stable. 'Blueray' was listed on 23 state surveys, but does not seem to be increasing, perhaps due to its inability to be harvested mechanically. Among new cultivars, 'Elliott' is increasing the most, and is currently in fifth place in hectareage.

Based on trend projections, there likely

will be a future increase in plantings of the northern highbush cultivars 'Bluecrop', 'Elliott', 'Patriot', 'Spartan', and 'Duke'; and of the half-high cultivars 'Northblue' and 'St. Cloud'. Conversely, the cultivars 'Jersey', 'Weymouth', 'Rubel', 'Berkeley', 'Bluetta', 'Earliblue', 'Northland', 'Collins', 'Murphy', and 'Coville' will probably decline in popularity.

Among rabbiteye cultivars, 'Tifblue' dominates, occupying 40% of the rabbiteye hectareage (Table 2). It is listed among the top five cultivars in all eight rabbiteye-producing states. However, the percentage of rabbiteye hectareage occupied by 'Tifblue' is less than the 53% reported for 1989 by Spillers (1990). 'Climax', in second place, also is listed by eight states and is increasing in popularity in four states. 'Brightwell', a relatively new cultivar, occupies third place in rabbiteye plantings and shows a strong increase in popularity. 'Woodard', once a major cultivar, is in rapid decline. 'Premier' and 'Powderblue' are expected to increase in importance in the future, while 'Delite' is declining in all states in which it is grown.

Only two southern highbush cultivars were reported in this survey. 'Sharpblue' is a major cultivar in Florida, while

Table 2. *Blueberry cultivars in North America, 1992.*

Cultivar	Area		No. states in top 5 ^a	Trend ^a		
	Hectares	Percent ^b		Increasing	Stable	Decreasing
Highbush						
Bluecrop	6173	35	26	10	12	2
Jersey	3030	17	9	0	2	6
Weymouth	996	6	1	0	0	1
Croatan	948	5	1	0	1	0
Blueray	740	4	23	2	16	3
Elliott	703	4	8	5	3	0
Rubel	551	3	1	0	0	1
Berkeley	420	2	12	2	6	4
Bluetta	335	2	3	0	1	2
Patriot	211	1	11	7	1	1
Earliblue	189	1	8	1	1	5
Duke	166	1	1	1	0	0
Northland ^w	126	1	4	0	1	2
Collins	106	1	6	0	2	4
Murphy	95	<1	1	0	0	1
Coville	85	<1	5	0	3	2
New Murphy	79	<1	1	0	0	1
1613A	49	<1	1	1	0	0
Bluejay	42	<1	1	1	0	0
Northblue ^w	27	<1	3	3	0	0
Spartan	7	<1	3	2	0	0
Northcountry ^w	5	<1	2	1	1	0
Darrow	2	<1	1	0	1	0
Northsky ^w	1	<1	2	0	1	1
St. Cloud ^w	1	<1	1	1	0	0
Rabbiteye						
Tifblue	1583	40	8	3	3	2
Climax	815	21	8	4	2	2
Brightwell	276	7	5	5	0	0
Premier	187	5	6	3	3	0
Woodard	158	4	5	0	1	4
Delite	93	2	3	0	0	3
Powderblue	92	2	2	2	0	0
Aliceblue	85	2	1	0	0	1
Beckyblue	85	2	1	0	0	1
Homebell	2	<1	1	0	0	1
Southern highbush						
Sharpblue	213	56	1	1	0	0
O'Neal	63	17	1	1	0	0

^aNumber of respondents indicating the trend for the cultivar.

^bPercent of total area within each species type.

^cOf 35 states and four provinces reporting.

^wThese cultivars were derived from crossing *V. corymbosum* x *V. angustifolium* and are commonly classed as "half-high" blueberries.

'O'Neal' plantings are increasing in North Carolina. Moore's (1993) survey indicated that southern highbush cultivars would show the greatest percentage of growth in plantings of all cultivated blueberries by the year 2000; therefore, the hectareage of these and newer southern highbush cultivars are expected to take a sharp upturn.

Respondents were asked to list new cultivars that show promise in their states/provinces. Eleven northern highbush, six rabbiteye, and nine southern highbush cultivars were listed by one or more respondents (Table 3). Some of these cultivars also appear on the list of major cultivars in other states (Tables 1 and 2).

The most-promising new northern highbush cultivar, based on responses, is 'Duke', which was listed on 11 returns. Preliminary testing indicates that 'Duke' may be similar to 'Bluecrop' in being widely adapted, because it is listed as promising from Arkansas to Ontario and west to Oregon and British Columbia. 'Bluejay', 'Nelson', 'Toro', and 'Patriot' were also listed as promising on several ballots.

Among newer rabbiteye cultivars, 'Briteblue' and 'Brightwell' appear promising across the southern United States, as do the southern highbush 'Georgiagem', 'Cooper', 'Gulfcoast', and 'Blueridge'. 'Sharpblue' and 'O'Neal' are already established cultivars in some states, while 'Reveille' and 'Bladen' are too new to have been evaluated adequately outside of North Carolina.

Several significant changes have occurred in the blueberry cultivar situation in the past decade. Among major changes listed by survey respondents are: Southern highbush increasing in the southern United States; new half-high cultivars being planted in the upper Midwest; a switch to cultivars that can be machine-harvested; a shift to more-hardy cultivars ('Patriot', 'Blueray', and 'Northland') in New England; a shift to earlier-ripening rabbiteye cultivars; and a general trend toward increased plantings of 'Bluecrop', 'Duke', and 'Elliott', with decreased interest in 'Collins' and 'Covill'.

Respondents were asked to list the major genetic limitations of blueberry cultivars available at present. Limitations reported (in order of frequency of listing) were: Lack of cold hardiness (11); susceptibility to spring frosts (7); lack of adaptation to high soil pH (7); lack of upland and heavy soil adaptation (6); lack of adaptation to machine-harvest (5); drought susceptibility (4); early bloom of rabbiteye and southern highbush cultivars (4); poor fruit quality (4); susceptibility to cane blight (4), phytophthora root rot (3), phomopsis rot (3), viruses (2), fusarum canker (1), mummyberry (1), and necrotic

Table 3. *Promising new blueberry cultivars in North America.*

Cultivar	States/provinces
Northern highbush	
Duke	Ark., B.C., Conn., Ind., Mich., Mo., N.H., N.J., Ont., Ore, Pa.
Bluejay	Conn., Idaho, Ind, Ky., Ohio, Que., Wash.
Nelson	Ind., Mich, Mo., N.H., N.J., N.Y., Ore.
Toro	B.C., Idaho, N.Y., Ont., Ore.
Patriot	Ill., Ky., Mass., Wash., Wis.
Elliott	Ill., Mich., Ohio, Okla.
Spartan	Conn., Ind., Que.
Northblue	Idaho, Minn, Que.
Sierra	N.J., N.Y.
St. Cloud	Minn.
Northsky	Neb.
Rabbiteye	
Briteblue	Ga., La., S.C., Tenn.
Brightwell	La., S.C., Texas
Powderblue	La., S.C.
Centurion	S.C.
Snowflake	Fla.
Windy	Fla.
Southern highbush	
Georgiagem	Ga., La., Texas
Cooper	La., Miss., Texas
Gulfcoast	La., Miss.
Blueridge	Miss., Va.
Cape Fear	La.
Sharpblue	Texas
O'Neal	Okla.
Reveille	N.C.
Bladen	N.C.

ringspot (1); poor fruit set (1); and lack of early ripening cultivars with good fruit quality (1). It is noteworthy that several of these limitations are associated with the current trend in North America of expanding blueberry production into nontraditional climatic and soil regions. As blueberry production continues to expand into new areas, cultivar limitations in adaptability are becoming more apparent.

A part of the 1992 survey concerned blueberry research programs in progress. Of 10 areas of blueberry research reported, cultivar testing was listed most often, ongoing in 32 of 35 reporting states and provinces. This high activity in cultivar testing indicates the general perception that blueberry production problems can be addressed best by new superior cultivars. Interest is especially high in identifying cultivars with improved cold hardiness, soil adaptability, and disease and insect resistance.

Despite the need for improved cultivars and the wide interest in testing genetic material, only 10 states/provinces reported involvement in breeding programs. These are: Alaska, Arkansas, Florida, Georgia, Michigan, Minnesota, Mississippi, New Jersey, North Carolina, and British Columbia. Many

"As blueberry production continues to expand into new areas, cultivar limitations in adaptability are becoming more apparent."

of these are cooperative programs with the USDA. Of the 10 breeding programs, five are involved with improvement of northern highbush (Arkansas, Michigan, New Jersey, North Carolina, British Columbia), four with rabbiteye improvement (Florida, Georgia, Mississippi, North Carolina), and five with breeding southern highbush (Arkansas, Florida, Georgia, Mississippi, North Carolina). In several states, dual programs are conducted to improve two or more types of blueberry (Arkansas, Florida, Georgia, Mississippi, North Carolina). The Minnesota program is focused on developing half-high cultivars for the upper Midwest by hybridizing highbush and lowbush. In Alaska, a breeding program has been initiated recently to improve the native species, *V. uliginosum* L.

Future outlook

The blueberry cultivar situation in North America recently has entered into an era of rapid change. This has been brought about by recent releases of new cultivars and intensified production problems caused by biotic and abiotic agents. The current trend to increase blueberry production in nontraditional climates and soils is revealing a new set of problems and challenges. The best approach to adapting blueberries to varying soils, sites, and pest pressures appears to be

through genetic manipulation of the host plant. Much of the current breeding effort is directed toward meeting these challenges.

The blueberry industry of North America has grown rapidly in the past half-century and has potential for even greater expansion in the future. The key to achieving this potential on state, regional, and national levels will be in the availability of superior, adapted blueberry cultivars. Current activities in blueberry breeding instill optimism for the future, but it is imperative that blueberry breeding programs be maintained and sustained if the blueberry industry of North America is to achieve its full potential.

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