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Highbush Blueberry Cultivars and Production Trends[1]

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Abstract

Highbush blueberry (*Vaccinium corymbosum* L.) production in North America has increased dramactically over the last 10 years (5). Acreage has expanded rapidly in all of the traditional regions and strong industries have developed in several non-traditional areas as well. This paper will summarize the current status of highbush blueberry acreage and cultivar use in North America. Since significant highbush blueberry industries will likely develop in several countries outside of North America, acreage trends in these countries are also discussed.

The following fruit researchers and Extension workers were contacted in 1989 to compile information for specific production areas: Richard Hayden (Purdue University, Lafayette, IN), David Handley (University of Maine, Orono, ME), Dominic Marini (University of Massachusetts, E. Bridgewater, MA), Steven Justace (Vermont Department of Agriculture, Burlington, VT), Paul Eck (Rutgers Univer-

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Table 1. Highbush blueberry acreage in the major producing countries, 1979, 1989, and 1999 (anticipated).

	Hectares		
	1979	1989	1999
Australia	0	90	100
Canada			
British Columbia	1000	1600	2400
Ontario	20	220	350
Quebec	10	80	200
Chile	1	30	4500
F. R. Germany	160	260	300
France	0	25	100
Holland	120	200	300
Italy	1	15	50
New Zeland	25	400	400
Poland	100	140	300
United States			
Indiana	100	140	180
Michigan	4050	6100	7500
New England[1]	400	500	600
New Jersey	3440	3890	4250
New York	240	400	650
North Carolina	1660	1740	1860
Ohio	100	120	140
Oregon	200	530	930
Ozark Region[2]	80	500	800
Washington	320	360	490
TOTAL	12027	17320	26360

[1]Includes CT, MA, ME, NH, RH, VT.
[2]Includes AK, MO, OK.

Acreage. Highbush blueberry acreage in 1979, 1989, and 1999 (anticipated) is summarized in Table 1. Acreage increased in all locations between 1979 and 1989, and further increases are expected over the next ten years in all areas but New Zealand. Worldwide acreage expanded 44% since 1979 and is projected to rise an additional 52% between 1989 and 1999.

Currently, 93% of the blueberry acreage worldwide is located in North America. Michigan accounts for the greatest percentage of North American acreage (38%), followed by New Jersey (24%), North Carolina (11%) and British Columbia (10%). It is predicted that by 1999, North American acreage will represent 77% of blueberry plantings worldwide. The majority of the growth outside of North America is anticipated in Chile.

Although highbush blueberry acreage is clearly increasing (Table 1), it is difficult to predict accurately what impact this growth will have on worldwide production. Average yields vary considerably by region (2), and yield potential in some newer production areas (Chile) is not clear. Highbush blueberries may require six to eight

years to reach maximum productivity, further complicating production projections. However, North American blueberry production increased at an annual rate of 10% between 1976 and 1986 and was projected to increase at a similar rate through 1995 (5).

Cultivars. The five most important cultivars in each production area are summarized in Table 2. Cultivars comprising the greatest proportion of total worldwide acreage are listed in Table 3. Figures in Table 3 were calculated from current acreage (Table 1) and cultivar importance (Table 2) in each region.

The most striking statistic is the dominance of 'Bluecrop' in both the USA and world. 'Bluecrop' was released in 1952 (New Jersey) and now encompasses 32% of the total acreage (Table 3), is the leading cultivar in nearly all production regions, and its acreage is still increasing in most regions surveyed (Table 2).

'Jersey' (released in 1928, New Jersey) is the second leading cultivar worldwide, though it is less widely utilized than 'Bluecrop.' Nearly 90% of its acreage is located in Michigan. Virtually all of the acreage of 'Croatan' (1954 release, North Carolina), the

Table 2. Leading cultivars in each production region. Cultivars in italics are the ones most often planted currently.

Location	Cultivars and % of regional acreage
Australia	*Bluecrop* (20) *Brigitta* (20) Denise Blue (15) Bluerose (15)
Canada	
British Columbia	*Bluecrop* (40) Rancocas (20) June (10) Pemberton (10) Hardiblue (5)
Ontario	*Bluecrop* (40) Northland (15)[y] Blueray (10) *Patriot* (10)[y]
Quebec	Northland (25) Bluecrop (25) Blueray (25) Berkeley (10) *Patriot* (10)
Chile	Bluecrop (30) Blueray (20)
France	Bluecrop (50) Collins (20) *Patriot* (12) *Bluetta* (10)[y]
F. R. Germany	*Bluecrop* (25) Bluetta (15) Earliblue (5) Berkeley (10) Blueray (5) Herma (5)
Holland	*Bluecrop* (35) Goldtraube (25) Berkeley (13) Dixi (10) Burlington (10)
Italy	*Blueray* (25) *Berkeley* (20) *Coville* (20) *Darrow* (15) *Bluecrop* (15)
New Zealand	Jersey (20) Atlantic (20) Dixi (15) Burlington (10)
Poland	*Bluecrop* (70) Weymouth (10) Jersey (10) Herbert (5) Darrow (5)
United States	
Indiana	Bluecrop (60) Elliot, Jersey
Michigan	Jersey (46) *Bluecrop* (23) Bubel (10) *Elliot* (4) Blueray (3)
N. Carolina	*Croatan* (60) Murphy (10) Jersey (8) New Murphy (6) Harrison (3)
New England[z]	Bluecrop Blueray Berkeley Jersey Patriot
New Jersey	*Bluecrop* (55) Weymouth (25) Blueray (10) Bluetta (5) *Duke* (5)
New York	Bluecrop (40) *Blueray* (25) *Patriot* (20) Berkeley (10) Northland (5)
Ohio	Coville (20) Blueray (15) Berkeley (15) Bluecrop (10) Jersey (10)
Oregon	*Bluecrop* (30) *Berkeley* (25) Earliblue (7) Jersey (7)
Ozark Region	*Bluecrop* (75) Collins (15) Blueray (4) Bluejay (3) Bluetta (2)
Washington	*Bluecrop* (25) Jersey (15) Weymouth (10) Berkeley (10) *Bluejay* (10)

[z]Estimates of percent of acreage not available.
[y]Have *V. angustifolium* in ancestry.

Table 3. Most popular cultivars worldwide in 1989.

Cultivar	Total hectares	% of area worldwide
Bluecrop	5450	32.4
Jersey	3150	18.7
Croatan	1040	6.2
Weymouth	1010	6.0
Blueray	780	4.6
Rubel	610	3.6
Rancocas	320	1.9
Berkeley	280	1.7
Elliot	240	1.4
Bluetta	220	1.3

third leading cultivar worldwide, is present in North Carolina. 'Weymouth' (1936, New Jersey) is found predominately in New Jersey.

Several newer cultivars are beginning to gain in importance. 'Elliot' (1974, Michigan) is already 1.4% of the worldwide acreage. 'Patriot' (1976, Maine-USDA) is commonly planted in Ontario, Quebec, France, New England and New York. 'Bluejay' (1978, Michigan) has attracted interest in Washington, Australia, British Columbia, Holland, Poland, Arkansas and

Table 4. Characteristics of current cultivars which limit production.

Characteristic	Location
	Climate and Soil Limitations
Winter hardiness	New England, Michigan, New Jersey, New York, Quebec, Ontario, Poland
Adapt to mineral or high pH soils	New York, Ohio, Ozark Region, F. R. Germany, France, Hollnad, Italy
Drought tolerance	Ohio, Ozark Region
Heat tolerance	Australia, France
Spring frost	New Jersey, Michigan and F. R. Germany
	Diseases
Canker[z]	Michigan (P, F), New England, New Jersey (B), New York (P), Ozark Region (P), Poland (F), Germany (P, F)
Virus	Michigan (Blueberry leaf mottle, shoestring), New Jersery (red ringspot), Oregon (Blueberry scorch), Washington (Blueberry scorch)
Phytophthora root rot	Ozard Region, Chile
Mummyberry	New England, British Columbia
	Fruit Characteristics
Stem scar	New Jersey, North Carolina, Australia
Firmness	New Jersey, North Carolina
Prolonged ripening season	New Jersey, Poland
Lack of early or late ripening cultivars	Australia, New Zealand, Michigan, F. R. Germany
Shelf and storage life	Australia, North Carolina

[z]Includes Phomopsis (P), Fusicoccum (F), and Bortyosphaeria (B).

Ohio. 'Spartan' (1977, USDA) shows promise in Holland, Poland, Michigan and New Jersey. Of the very new releases, 'Duke' (1987, New Jersey-USDA) and 'Nelson' (1989, USDA) have received preliminary praise in the Pacific Northwest, New Jersey and Michigan. The New Zealand cultivars 'Nui,' 'Puru' and 'Reka' hold promise in that country (4), and two new German cultivars, 'Greta' and 'Gila,' show potential in the F. R. Germany (1).

Factors Limiting Production. Resource people in each region were asked to list the characteristics of currently available cultivars which limit production or the potential for expansion of blueberry acreage. Limitations related to climate and soils, diseases and fruit characteristics were cited (Table 4).

Susceptibility of cultivars to winter injury and spring frosts is a serious limitation in northern regions of North America and Europe. Drought and heat tolerance of cultivars were also considered limitations in some of the warmer regions. Lack of cultivars adapted to mineral soils or alkaline pH was a limitation in numerous production regions.

Lack of cultivar resistance to various canker and virus diseases was a widely stated limitation to production. The most serious virus diseases were Blueberry leaf mottle and shoestring (MI), Red ringspot (NJ) and Blueberry scorch (OR, WA). Other diseases limiting production in specific regions included Botrytis, Phytophthora root rot and Mummyberry.

Several fruit characteristics which influence fresh marketing of fruit also limited production. Fruit firmness, stem scar characteristics and shelf life are problems associated with fresh marketing of berries in New Jersey, North Carolina and Australia. Lack of cultivars which extend the harvest season (both early and late) restricted production in some regions.

Conclusions

In spite of numerous factors limiting the production of highbush blueberry cultivars worldwide, acreage is increasing dramatically. 'Bluecrop' is by far the dominant cultivar, with numerous others being widely planted. Worldwide acreage is expected to expand by 54% over the next decade and much of the expansion will come in non-traditional areas such as Chile.

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