

You spoke, we listened: Stakeholder-identified priorities for research and extension in the U.S. blackberry industry

Margaret Worthington


Michael Coe

Amanda McWhirt

Lizzy Herrera

Background Information

- Strik et al. (2007) report on Worldwide Blackberry Production
 - Production statistics
 - Issues facing the industry
 - Great document but out of date
 - Hard to find current information about US industry and research needs in one place
- SCRI planning grants
 - Fund grant planning meetings and related research



Worldwide Blackberry Production

By Radhika C. Strik¹, John R. Clark², Chad E. Finn³, and M. Pilar Ballester⁴

ABSTRACT. Under various names, raspberries, were planted, varieties, production systems, fruit, semi-cult, trailing, primocane-bearing blackberry

Keywords. A survey of worldwide blackberry (*Rubus* spp.) production was conducted in 2005. Results indicated there were an estimated 23,535 ha of blackberries planted and commercially sold worldwide, a 45% increase from 1995. Wild blackberries still make a significant contribution to worldwide production, with 8000 ha and 15,400 Mg harvested in 2004. There were 7692 ha of commercially cultivated blackberries in Europe, 7189 ha in North America, 1640 ha in Central America, 1937 ha in South America, 297 ha in Oceania, and 100 ha in Africa. Worldwide production of cultivated blackberries was 140,293 Mg in 2005. Of the blackberry area worldwide, 50% was planted to semierect cultivars, 25% to erect, and 25% to trailing types. 'Flammarion', 'Loch Ness', and 'Chester Thornless' were the most important semierect types, and 'Raspae' and 'Marion' the most common erect and trailing types, respectively. In general, erect and semierect cultivars are grown for fresh market and trailing cultivars for processing. Fresh fruit are usually picked from the final container to the field, whereas 75% of trailing blackberries for processing are picked by machine. Common production problems are reported. Production systems for field-grown blackberry differ with type, region, and region. For example, in Mexico, production systems are modified to extend the production season for 'Tiger' and other erect type cultivars from mid October to June. Organic blackberry production is reported to increase from the 2528 ha planted in 2005. An estimated 515 ha of blackberries were grown under tunnels, mainly to protect against adverse weather and large high priced markets. Based on this survey, there may be 27,852 ha of commercial blackberry planted worldwide in 2016, not including production from harvested wild plants.

¹Worldwide and Domestic Fruit Crops Specialist, Department of Horticulture, Oregon State University, 9717-2222 Corvallis, Oregon 97331-2222

²Horticulture, Department of Horticulture, Plant and Soil Science, University of Arkansas, Fayetteville, Arkansas 72702

³Orlando Specialty, 10010-020, Department of Agriculture, Orange County, California, 92668, United States, 714-244-1200

⁴Horticulture, Faculty Department of Horticulture and Forestry, Universidad Católica de Chile, Valdivia 509 000, Chile

The authors appreciate the contributions of the following persons in various countries presented and other not mentioned (see Appendix, location of fruit types):

⁵Corresponding author. E-mail: radhika@oregonstate.edu

Units

To convert U.S. to M, multiply by	U.S. unit	SI unit	To convert SI to U.S., multiply by
0.0025	hectare	ha	2.471
0.00023	ton	kg	2.205
0.00000023	ton	g	0.0011
0.0000000023	ton	Mg	1.0002
2.471*	acre	M ²	0.00025

208

Purpose

1. Assess national blackberry production, identify challenges, and predict future trends
2. Engage stakeholders from diverse production regions to identify priorities for breeding, research, and extension
3. Develop objectives for an SCRI proposal that integrates research and extension in the U.S. blackberry industry

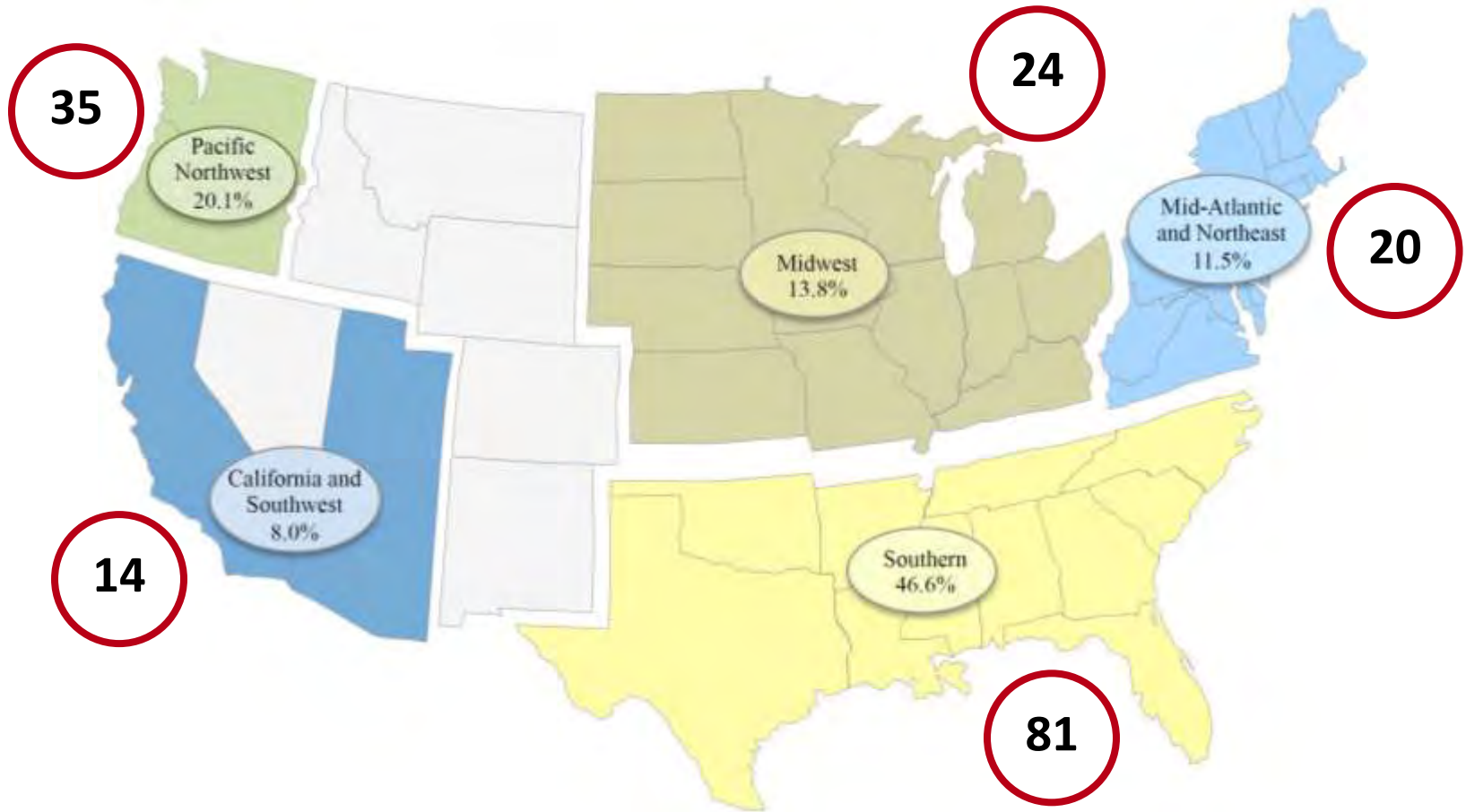
Survey Topics

- Organizational information
- General Questions for Growers
 - Fresh Market
 - Processing
 - Pest and Disease Issues
 - Cultural Issues
 - Other Issues
- Postharvest Issues and Consumer Demand
- Research and Breeding Priorities

Demographics

29	Oregon, Arkansas
24	North Carolina
9	California
7	Alabama, Georgia
6	Washington
5	Kentucky, Missouri, Ohio
4	Maryland, Michigan, Oklahoma, Virginia
3	Kansas, Mississippi, New Jersey, South Carolina, Utah
2	Connecticut, Florida, Tennessee
	Arizona, Indiana, Iowa, Maine, Massachusetts, Nevada,
1	New Hampshire, New York, Pennsylvania, Vermont, West Virginia
174	Total

Demographics



- Hands up! - Who took the survey?

Demographics

- “Which term best describes your organization’s role in the blackberry industry?”

137	Grower/Farm
23	Marketer
14	Processor
13	Researcher
11	Extension/Consultant
11	Shipper/Packer
9	Nursery
7	Other

- Coming later – acreage, sales, employees, etc...

Pest and Disease Issues

- Spotted wing drosophila
- Raspberry crown borer
- Broad mite
- Red berry mite
- Two-spotted spider mite
- Thrips
- Red-necked cane borer
- Stink bugs
- Strawberry clipper
- Nematodes
- Raspberry bushy dwarf virus
- Blackberry yellow vein disease
- Other viruses
- Phytophthora root rot
- Downy Mildew
- Powdery Mildew
- Anthracnose
- Orange rust**
- Cane and leaf rust**
- Septoria leaf spot
- Orange felt disease
- Botrytis
- Cane blight
- Double blossom/ rosette

Pest and Disease Issues

	National	CA-SW	MA-NE	Midwest	PNW	South
Spotted wing drosophila	1	1	1	1	1	1
Raspberry crown borer					1	
Broad mite	3	2				2
Red berry mite		2				
Two-spotted spider mite		2	3			3
Thrips		2				
Stink bugs	2			1	3	2
Other viruses	2		2			2
Phytophthora root rot	3	3			2	3
Downy Mildew	3	2		2		
Anthracnose	2	2	3	3	3	1
Orange rust	3		1			2
Cane and leaf rust			1			3
Septoria leaf spot	3		2		3	3
Botrytis	2	3	1		2	2
Cane blight	3		2			2

Not major issues: Red-necked cane borer, Strawberry Clipper, Nematodes, Raspberry bushy dwarf virus, Blackberry yellow vein disease, Powdery Mildew, Orange Felt Disease, Double Blossom/Rosette

Missing from list: Japanese Beetles and June bugs!

Cultural Issues

	National	CA-SW	MA-NE	Midwest	PNW	South
Weed control	1	3	1	1	1	1
Postharvest losses	3	1	3			2
Red drupelet reversion	2	1	2			2
Thorns and other contaminants		3			2	
White drupelet disorder/sunscald/UV damage	2		1	3	2	2
Poor or uneven drupelet or berry set		3				3
Winter injury to canes or buds	2		1	2	2	3
Insufficient chilling hours						3
Rain during harvest season	2		3		2	1
Drought stress						2

Production Issues

	National	CA-SW	MA-NE	Midwest	PNW	South
Labor availability	1	1	1	1	1	1
Labor cost	1	1	1	3	1	1
Loss of effective compounds for pest, weed, or disease control	2	2	2	3	3	2
Low prices for blackberries	1	1		3	1	2
Competition from imported blackberries	2	2			1	2
Cost of land	3	1	3		1	3
Lack of access to clean plants of desired cultivars/varieties						
Lack of consumer demand for blackberries					2	
Costs of regulatory compliance and documentation	3	2	3		1	3
Lack of reliable access to markets					2	3

Postharvest Issues

	National	CA-SW	MA-NE	Midwest	PNW	South
White drupelet disorder or sunscald/UV damage	2		2	2		2
Red drupelet reversion	2	1				2
Contamination with thorns or other foreign material					1	
Leaky or overly soft berries	1	1			1	1
Botrytis or other fruit rots	2	2			1	2

Complaints from Consumers and Grocers about Blackberries

- **Flavor** (too tart, not sweet enough, especially if picked too early; “off” taste) [29]
- Wet, soft, leaky or over-ripe berries [12]
- Lack of berries to sell, especially locally-grown berries; berries imported or shipped long distances often have lower quality and hurt reputation [12]
- Seeds [9]
- Red drupelet reversion [8]
- Cost too high [8]
- Short shelf life in stores or in home refrigerators [8]
- Thorns [4]
- Desire for organically grown or reduced-pesticide berries [2]
- *Flavor was frequently mentioned by respondents from all regions; other complaints varied by region*

Recommendations for Increasing the Demand for Blackberries

- More research and education/marketing focused on health benefits [22]
- More and better general marketing and education about blackberries; recipes etc... [21]
- More consistently high quality blackberry availability [19]
 - Longer season, more growers, more awareness of and adherence to quality practices
 - Reducing the amount of low-quality berries in the marketplace
- Better flavor [17]
- Better firmness [6]
- Focus on harvesting and marketing blackberries as a fresh-frozen product [5]
 - if produced properly (picked at optimal time and immediately frozen) this can provide consistent high quality and year-round availability
- Reduction in red drupelet reversion [5]
- Longer shelf life [4]
- Seedless or smaller/softer seeds [2]

Research and Promotion of Health Benefits

Please rate your level of agreement with the following statements:	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
Investment in health benefits research would make selling blackberries easier (vs. other berries or fruits) and lead to greater sales volume	4.3%	5.1	3.6	19.6	30.4	37.0
Investment in health benefits research would justify charging higher prices for blackberries and lead to greater profitability per volume	6.6	5.8	9.5	35.8	18.2	24.1

Limits to Growth of the U.S. Blackberry Industry

- Labor availability and cost [25]
- Imported fruit that may have lower quality and/or production costs due to different regulations, and may be shipped into U.S. areas during the local harvest season [19]
- Better flavor [11]
- Better, more consistent fruit quality [9]
- More and better general marketing and education about blackberries [9]
- More research and education/marketing focused on health benefits [8]
- Pricing and profitability [7]
- Spotted wing drosophila, insect pests. [7]
- Cost of complying with regulations. [4]

Priorities for Research and Breeding

	National	CA-SW	MA-NE	Midwest	PNW	South
Red drupelet reversion		1	3			3
Improvement of postharvest shelf life	2	1	3		3	2
Health benefits of blackberries	2	3		2	2	2
Mechanical harvest of fresh market blackberries		3				
Substrate or containerized production		3				
Long-cane production		3				
New pruning and training practices (RCA etc.)	3	3		2		3
Breeding for low-chill environments		2				
Breeding for disease resistance	1	1	1	1	2	1
Breeding for cold hardiness or short growing seasons	2	2	2	2	2	
Breeding for improved flavor	1	1	1	1	1	1
Breeding for ideal plant architecture	3	2	3		3	2
Breeding for firmness to improve harvest and postharvest quality	1	1	2	3	2	1
Breeding for heat tolerance in primocane blackberries	2	1	2	2	3	1
Development of molecular breeding tools		2				
Control of spotted wing drosophila	1	1	1	1	1	1
Control of broad mite	3	1				2
Efficient irrigation strategies	3	2		2		3

Recommendations for Additional Blackberry Research

- Spotted wing drosophila, insect pests [14 comments]
- Disease resistance [15 comments]
- Improved plant architecture to support mechanical harvest, easier manual picking and pruning, or other labor efficiencies. [11]
- Better fruit quality (shelf life, visual appeal, firmness) [11]
- Better flavor [10]
- More research and education/marketing focused on health benefits [6]
- More and better general marketing and education about blackberries. [6]
- Red reversion, thornlessness, heat and drought tolerance weed control, cold-hardiness, organic or reduced-chemical growing practices, more efficient breeding [5 or fewer]

Next Steps

- Finish analysis and publish findings
- Use this information to guide proposal development and lists of research priorities
 - Already used for development of a Southern Pest Management Strategic Plan (PMSP)
 - Planning meeting today and tomorrow
- Please let me know if you have any thoughts/priorities/concerns not captured in the survey!

mlworthi@uark.edu

984.227.9787

Acknowledgments

- Michael Coe and Lizzy Herrera
- Amanda McWhirt, Chad Finn, Gina Fernandez, Bernadine Strik, Ellen Thompson, Mark Bolda, John Clark, Debby Wechsler, Mary Peterson, Lacy Nelson
- Everyone who took the survey!



North American
Raspberry & Blackberry
Association



United States Department of Agriculture
National Institute of Food and Agriculture