Southern Association of Agricultural Experiment Station Directors

Production and Marketing Practices and Trade Flows in the United States Green Industry, 2018

Southern Cooperative Series Bulletin #421
Green Industry Research Consortium
S-1065 Multistate Research Project
http://www.greenindustryresearch.org

May 19, 2020

Hayk Khachatryan, University of Florida
Alan W. Hodges, University of Florida
Charles R. Hall, Texas A&M University
Marco A. Palma, Texas A&M University

ISBN: 1-58161-421-9

S1065 Multi-state Project Cooperating States and Participants

S1065 Multi-state project (2015-2020) participants include Susan Barton (University of Delaware), Bridget Behe (Michigan State University), Cheryl Boyer (Kansas State University), Robin Brumfield (Rutgers University), Robert Brzuszek (Mississippi State University), Benjamin Campbell (University of Georgia), Vincent Duffy (Purdue University), Tom Fernandez (Michigan State University), Cory Gallo (Mississippi State University), William Graves (Iowa State University), Charlie Hall (Texas A&M University), Richard Harkess (Mississippi State University), Alan Hodges (University of Florida), Dewayne Ingram (University of Kentucky), Hayk Khachatryan (University of Florida), Jeff Kuehny (Louisiana State University), Lloyd Nackley (Oregon State University), Craig Nessler (Texas A&M University), Marco Palma (Texas A&M University), Benedict Posadas (Mississippi State University), Timothy Schauwecker (Mississippi State University), Richard Sloan (Mississippi State University), Ariana Torres (Purdue University), and Chengyan Yue (University of Minnesota)

Technical Committee

Hayk Khachatryan, University of Florida; Alan Hodges, University of Florida; Charlie Hall, Texas A&M University; Marco Palma, Texas A&M University

Acknowledgements

The 2019 *National Green Industry Survey* was conducted by the *Green Industry Research Consortium* (GIRC) of horticulturists and agricultural economists at U.S. land grant universities, organized as the S-1065 Multi-state project under the USDA-National Institute for Food and Agriculture (NIFA). The lead agricultural experiment stations for this study are the Food and Resource Economics Department at the University of Florida, the Department of Horticultural Sciences, and the Department of Agricultural Economics at Texas A&M University. A complete list of the GIRC participants, project objectives, previous reports, and resources can be found at www.greenindustryresearch.org.

This project was supported by a grant from the Horticultural Research Institute (HRI), and cost-sharing provided by the University of Florida and Texas A&M University. Assistance with preliminary survey data organization was provided by Alicia Rihn. The Florida Survey Research Center provided survey data entry services.

Table of Contents

List of Tables

List of Figures

Executive Summary

This report summarizes information on production and marketing practices and trade flows for U.S. ornamental plant grower and dealer firms, based on a national mail and Internet survey. The survey was conducted in mid-2019 and collected information on business practices and operating results for 2018 or fiscal year 2018-19. The main sections of the survey include questions about nursery and greenhouse irrigation and pest management practices, employment, annual sales, product types, market outlets, selling methods, advertising expenditures, and product distribution by state or country. The 2019 *National Green Industry Survey* is the seventh data collection effort conducted by the *Green Industry Research Consortium* since 1989. Following the previous report's structure, this seventh edition expanded the previous report by including horticultural retailers as well as wholesale growers, with detailed questions about the use of digital marketing tools.

Contact lists of ornamental plant grower and dealer firms for the survey were obtained from the state agricultural agencies responsible for phytosanitary inspection and licensing of plant businesses. A total of over 51,933 firms were compiled across all states, from which a sample of 43,877 firms were selected for the survey including 14,995 randomly selected firms receiving mailed questionnaires and 28,882 firms with valid email addresses that were contacted via email (Internet). Each firm initially received an introductory postcard, followed by two mailings of the survey instrument and reminder postcard messages. A total of 2,170 usable questionnaires were returned for the survey, representing an overall 4.9 percent response rate, including 1,141 respondents by mail (7.6% response rate) and 1,029 by email (3.6% response rate). Responses were received from all 50 states, with the largest number of responses from the Southeast, Midwest, and Northeast U.S. regions, representing 63 percent of the responses. Most results are reported by state and region. Some results are reported separately for grower (wholesaler) firms and plant dealer (retailer) firms.

A total of 1,727 (79.6%) participating firms reported annual sales totaling $2.39 billion in 2018, or an average of $1.39 million per firm. Respondents reported total employment of 35,719 permanent and temporary jobs, representing an average of 20.8 employees per firm, and average annual sales per employee of $66,972. Seventy-three percent of total sales reported were through wholesale channels and 20 percent at retail. The largest market channel for wholesale sales was re-wholesalers (26%), followed by landscape firms (23%), mass merchandisers (17%), single location garden centers (13%), home centers (7%), and multiple location garden centers (4%).

Among point-of-sale (POS) materials used in retail, the largest category reported was POS signs (19%), followed by bench tags (9%), posters (8%), and QR codes (1.4%). The majority of marketing materials used in retail were made in-house by the respondent firms (63%), while 13 percent were purchased from a supplier, 8 percent were received from a supplier for free, and 6 percent were purchased from other sources. *Facebook* was the dominant social media platform used, by 91 percent of respondent firms, followed by *Instagram* – a *Facebook* company – with 29 percent of firms, *Twitter* (12%), *LinkedIn* (9%), *Pinterest* (8%), *YouTube* (8%), *Yelp* (6%), *Houzz* (1.4%), *Reddit* (0.1%), and others (12%). Among firms that used websites for business practices, providing general information to clientele was the main purpose (24%), followed by displaying product availability (16%), online sales (8%), and other reasons (1%).

For factors potentially affecting the geographic range of business conducted by Green industry firms, plant offerings was rated as important/very important by 66 percent of respondents, followed by production (64%), transportation (63%), personnel (52%), and marketing (45%). In contrast, debt capital and equity capital were generally rated as not important. Among factors that potentially determine prices for Green industry products, cost of production was rated as important or very important by 71 percent of respondents, followed by grade of plants (60%), product uniqueness (59%), market demand (58%), inflation (46%), other growers' prices (43%), inventory levels (33%), and last year's prices (32%). Factors most affecting the overall health of the Green industry included market demand and weather uncertainty, rated as important/very important by 81 and 76 percent of respondents, respectively, followed by own managerial expertise (59%), labor (58%), ability to hire competent hourly employees (55%), competition/price undercutting (46%), balance of power with buyers and customers (45%), government regulations (39%), ability to hire competent management (38%), and environmental regulations (37%).

Production and Marketing Practices and Trade Flows in the United States *Green Industry*, 2018

Hayk Khachatryan, PhD, University of Florida, hayk@ufl.edu
Alan W. Hodges, PhD, University of Florida, awhodges@ufl.edu
Charles R. Hall, PhD, Texas A&M University, c-hall@tamu.edu
Marco A. Palma, PhD, Texas A&M University, mapalma@tamu.edu

Introduction

The *Green Industry Research Consortium* (GIRC), organized as the multi-state research project under the USDA-National Institute for Food and Agriculture (NIFA) has regularly conducted national surveys to document production, management, marketing, and trade practices within the U.S. Green industry since 1989. The 2019 *National Nursery Survey*, which gathered annual information for 2018 or the most recent fiscal year completed, represents the seventh such effort by the GIRC. Previous national surveys for 1988, 1993, 1998, 2003, 2008, and 2014 were reported by Brooker et al. (1990, 1995, 2000, 2005) and Hodges et al. (2010, 2015). The objective of these surveys is to document changes in business practices over time and across regions and provide information useful to stakeholders, including nursery/greenhouse growers, re-wholesalers, allied industry professionals, garden center retailers, state university Extension personnel and researchers. Additionally, the information is regularly used by industry stakeholders in communicating the relevance and economic impacts of the Green industry at the county, state and regional levels. The descriptive reports primarily focus on production issues such as plant types and forms grown, labor, irrigation methods, water sources, and pest management, along with marketing practices (distribution channels, selling methods, in-store advertising practices, and social media presence), and a range of factors affecting pricing strategies and overall business growth and opportunities. The reports also summarize domestic (regional and state) and international trade flows of finished products and propagation materials. The present survey expanded its focus on POS and digital marketing strategies used by industry representatives, thus attempting to identify needs and opportunities in active and effective communication with end consumers.

The Green industry has experienced unprecedented growth, innovation, and change over the last three decades, during which it has been among the fastest-growing agricultural industries in the 1980s and 1990s. Industry growth was primarily due to robust demand for ornamental plants and related supplies and services from commercial and residential construction. However, the economic recession of 2007-09

considerably reduced residential construction and home ownership rates. Decreased demand for horticultural products and services, coupled with an increasingly competitive business landscape, has placed considerable financial pressure on the industry (Hall 2010). After recovering from the 2007-09 recession, direct industry output for all Green industry sectors in 2013 was estimated at $136.44 billion (B), and total economic contributions, including regional economic multiplier effects, were estimated at $196.07 B (Hodges et al. 2015). According to the same study, the industry had direct employment of 1.59 million (M) full-time and part-time jobs, and total employment contributions of 2.03 M jobs in the broader economy. Since the previous study (conducted for 2007), the total economic contributions increased by 4.4% for employment, 2.0% for revenues, and 2.7% for real (price change-adjusted) GDP.

Business survival and growth in the current fast-paced, consumer-driven economy requires a progressive mindset and a willingness to strengthen existing or develop new core competencies or markets, which may incur higher risk. While the outlook may be somewhat uncertain in terms of the growth and nature of consumer demand, it is clear that innovativeness will continue to be a requisite skill in ensuring the survivability and profitability of Green industry firms in the future. Much of this innovativeness must focus on enhancing the value proposition offered by industry firms by emphasizing the economic benefits (e.g., enhanced property value), social benefits (e.g., health and well-being), and environmental benefits (e.g., energy/water savings , use of recyclable/compostable containers) that Green industry products and services offer to consumers (Hall and Dickson 2011).

Methods

Information collected in the 2019 *National Green Industry Survey* includes annual sales, fulltime and part-time employment, plant types produced, native plants, product forms, market distribution channels, interstate and international trade flows of finished products and propagation materials, selling methods, advertising forms, irrigation water sources and application methods, integrated pest management (IPM) practices, year of business establishment, and factors affecting business growth and pricing. All information collected pertained to business practices and operating results for the calendar year 2018 or fiscal year 2018-19. Questions in the survey asked respondents to indicate the percentage share of the total activity for each specific item (with all items totaling 100 percent), to indicate items on checklists, provide Yes/No answers, fill-in open-ended blanks, or rate factors using Likert scales or sliders. A copy of the survey questionnaire is provided in the Appendix. The questionnaire and survey protocol were approved by the University of Florida's Institutional Review Board for compliance with ethical standards for human test subjects research.

This study represented the seventh national survey conducted by the *Green Industry Research Consortium*, following previous surveys in 1988, 1993, 1998, 2003, 2008, and 2014. The content of the survey has remained very similar over time, in order to provide consistency in the time-series data, but has evolved in response to changes in the industry such as POS or digital marketing practices. For example, questions about market channels have been revised to capture sales to mass merchandise chain stores, home centers, and re-wholesalers. New questions were added to the 2004 survey to address water use and sources of irrigation water, sales of native plants, and integrated pest management (IPM) practices. The 2014 survey targeted plant dealer firms, including retail garden centers and landscape services providers, as well as growers for the first time, with new questions added regarding retail marketing practices. The present survey included detailed questions about social media use and advertising expenditures for digital marketing practices.

For the 2019 survey, a list of over 51,933 grower and plant dealer firms in the U.S. was compiled. The list contained information on the company name, contact person, mailing address, and in some cases, telephone numbers, email addresses, and type of business (grower or dealer). The listings for each state were obtained from members of the *National Plant Health Board*, an organization representing the plant health regulatory agencies in each state, which in most cases is the Department of Agriculture or its equivalent. All commercial growers and dealers of live plants are required to be registered and annually certified for compliance with phytosanitary regulations, so these lists of growers and dealers can be considered exhaustive to the extent of the force of law. Some states make their lists of firms available on a website, while others provide it upon request. The states of Alaska, Mississippi and Montana and the District of Columbia did not provide firm lists. Firm lists obtained from state agencies were supplemented with information available from the Dun & Bradstreet commercial database, available through the university library system. Email addresses of contact persons for firms listed by Dun and Bradstreet were compiled from company websites using the *Email Extractor* software. A sample of 43,877 firms were used for the survey, including 14,995 randomly selected firms for the mail survey, and 28,882 firms with email addresses for the email (Internet) survey, as shown in

Table 1. Firms to be surveyed via email were removed from the population considered for the mail survey to avoid duplication.

The surveys were distributed during March-May, 2019. Following best practices for survey research, an introductory letter was first sent to selected firms to explain the purpose and benefits of the project, and all printed survey materials contained the logos of the sponsoring organizations to enhance the credibility and legitimacy of the survey (Dillman et al. 2009). Two mailings of the survey questionnaire were sent to

firms selected for the mail survey, along with postage-paid return envelopes. Reminder postcards were mailed to respondents about one week after each survey mailing. Mailed questionnaires were imprinted with a code number matched to the mailing list, in order to identify respondents for quality control purposes. Completed surveys were returned to the University of Florida for data entry and analysis.

The online version of the survey was implemented at the same time as the mail survey and followed the same general approach. The *Qualtrics* survey software platform was used to send batch email invitations, record survey responses in security-encrypted form, and track respondents. Three invitations to participate in the survey were made in March and April 2019, with the second and third email invitations sent only to those firms that had not responded. Firms were invited to participate in the online survey by clicking a link in the email message directing them to the survey website. Respondents were then explicitly asked for consent to participate in the survey and were given the option to decline or "opt-out," as required by laws governing electronic communications. Consenting respondents were asked a qualifying question: "Which of the following business activities was your firm involved in last year (2018)?" Respondents answering "Nursery/greenhouse grower," "Retail nursery/garden center," or "Landscaping services" were then directed to proceed with the survey, while those answering "None of the above" were thanked and the survey was terminated. It should be noted that the online version of the questionnaire and emailed letters of invitation closely matched the content of the printed/mailed surveys, except for the initial qualifying question, and several additional questions on retail marketing practices, so the results are comparable.

A total of 43,877 firms were contacted for the survey by mail or email (Internet) methods. A total of 2,170 valid questionnaires were returned for the survey, including 1,141 (53% of the total sample) respondents by mail, representing a 7.6 percent response rate, and 1,029 (47% of the total sample) by email (3.6 response rate), as shown in Table 1. Across firm types, 1,068 (49% of the total sample) respondents were growers only, i.e., reported only wholesale sales, 240 (11%) were plant dealers reporting only retail sales, 463 (21%) were grower/dealers with a mix of wholesale and retail sales, and 399 (18%) were of unknown type (Table 1). In some cases, survey results are reported separately for grower and plant dealer firms, as well as all responding firms.

The survey data were analyzed for individual states and aggregated across eight broad physiographic regions, as shown in Figure 1. Regionally, the number of survey respondents was highest from the Southeast (587), followed by Midwest (453), Northeast (337), Pacific (264), Appalachian (218), Southcentral (173), Mountain (94) and Great Plains (44). The top ten states with the highest number of respondents were Florida (433), California (141), Michigan (134), New York (112), Georgia (96), Ohio

(83), Oregon (82), Pennsylvania (81), Texas (80), and Indiana (70). In eleven states with less than 10 respondents (AK, AR, AZ, CT, KS, MS, NV, RI, SD, UT, and WY), the results may be less reliable. Overall, 80 percent of respondents reported the key information of annual sales, and 75 percent reported the number of employees.

The survey data were coded and entered into worksheets for tabulation and analysis. Annual sales for each firm were estimated at the midpoint or average of the indicated sales range, unless the actual sales were specified (Table 2). Sales for each product type, market channel, etc. within each firm were estimated from the annual sales, together with the reported percentage breakdown, so that results represent sales-weighted averages.

Figure 1. Map of U.S. regions for analysis of the Green industry

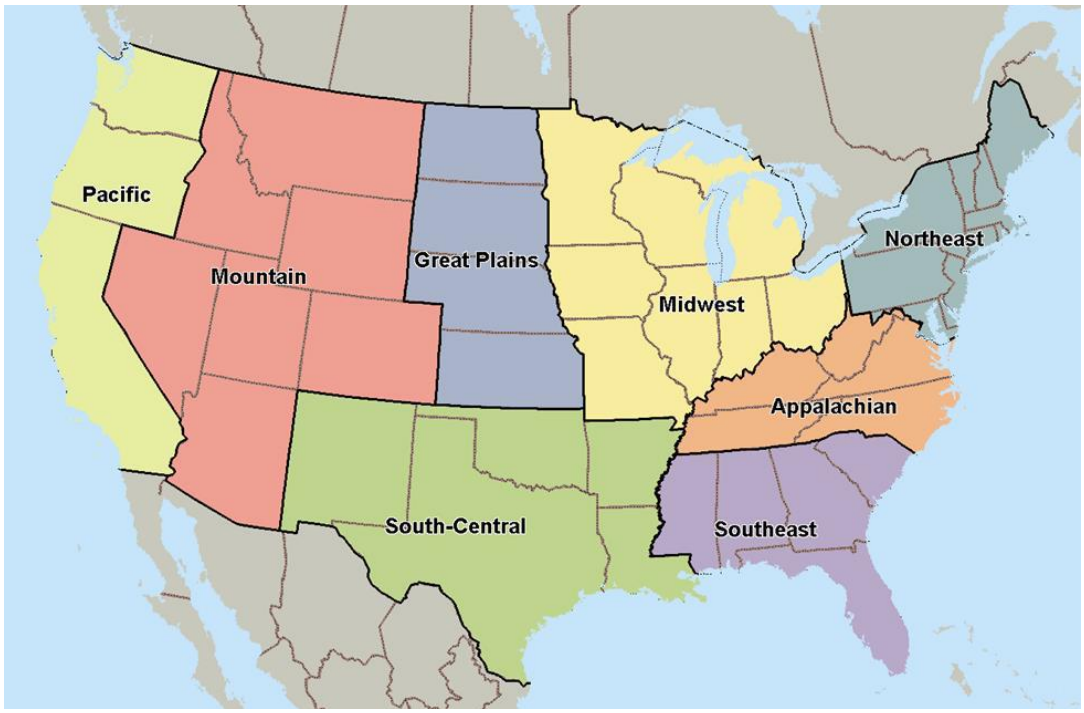


Table 1. Green industry population, mail and internet survey sample, and number of respondents, by state

Region, State	Population of Firms	Survey Sample by Survey Group		Total Number of Respondents	Respondents by Survey Group		Respondents by Firm Type			
		Internet	Mail		Internet	Mail	Grower only	Dealer only	Grower and Dealer	Type NA

Appalachian	**5,029**	**3,461**	**1,039**	**218**	**119**	**99**	**113**	**13**	**59**	**33**
KY	669	400	178	45	17	28	27	1	11	6
NC	1,235	662	369	65	34	31	40		22	3
TN	2,347	2,088	167	64	57	7	25	5	10	24
VA	665	305	218	25	11	14	12	4	9	
WV	113	6	107	19		19	9	3	7	
Great Plains	**1,004**	**660**	**302**	**44**	**19**	**25**	**7**	**12**	**15**	**10**
KS	119	16	103	9	1	8	2	2	4	1
ND	101	2	99	10		10	2	4	4	
NE	737	635	60	21	17	4	2	5	5	9
SD	47	7	40	4	1	3	1	1	2	
Midwest	**11,811**	**7,727**	**2,579**	**453**	**249**	**204**	**133**	**58**	**97**	**165**
IA	442	71	235	26	1	25	9	4	8	5
IL	847	243	397	31	1	30	11	6	11	3
IN	2,323	2,040	166	70	58	12	9	10	13	38
MI	3,481	2,698	495	134	110	24	38	15	11	70
MN	474	59	259	20	2	18	11	1	5	3
MO	507	199	188	22	8	14	6	7	4	5
OH	2,871	2,348	339	83	66	17	20	9	18	36
WI	866	69	500	67	3	64	29	6	27	5
Mountain	**2,211**	**1,088**	**847**	**94**	**51**	**43**	**30**	**14**	**15**	**35**
AZ	156	59	97	5	1	4	3	1	1	
CO	924	706	144	44	36	8	8	7	5	24
ID	373	284	58	16	14	2	6	3	2	5
MT	277	9	166	12		12	7	1	3	1
NV	70	4	66	2		2			1	1
UT	187	24	163	8		8	5	1	2	
WY	224	2	153	7		7	1	1	1	4
Northeast	**7,144**	**2,114**	**3,151**	**337**	**60**	**277**	**178**	**32**	**106**	**21**
CT	291	151	90	5	2	3	3	2		
DE	371	341	22	15	13	2	5	6	3	1
MA	225	41	115	11	4	7	3	2	2	4
MD	381	35	207	17	1	16	12	1	4	
ME	804	629	110	29	18	11	17	3	7	2
NH	478	387	53	10	8	2	6	1	3	
NJ	857	57	499	38		38	24	1	9	4
NY	2,169	83	1,271	112	4	108	61	6	42	3
PA	1,115	108	638	81	2	79	38	7	31	5
RI	111	11	100	7	1	6	3	2		2
VT	342	271	46	12	7	5	6	1	5	
Pacific	**7,246**	**1,916**	**3,456**	**264**	**50**	**214**	**174**	**23**	**54**	**13**

AK	30	9	21	3		3	1		2	
CA	3,618	145	2,211	141	1	140	91	12	35	3
HI	186	31	155	13		13	11		2	
OR	2,456	1,642	533	82	47	35	53	11	11	7
WA	956	89	536	25	2	23	18		4	3
Southcentral	**4,671**	**2,071**	**1,707**	**173**	**53**	**120**	**77**	**24**	**36**	**36**
AR	237	146	56	3		3	1		2	
LA	1,741	1,341	259	57	41	16	17	3	8	29
NM	205	7	134	13		13	8	2	3	
OK	702	497	138	20	10	10	4	6	7	3
TX	1,786	80	1,120	80	2	78	47	13	16	4
Southeast	**12,817**	**9,845**	**1,914**	**587**	**428**	**159**	**356**	**64**	**81**	**86**
AL	377	152	139	19	6	13	15	1	2	1
FL	8,810	6,826	1,237	433	308	125	269	50	57	57
GA	2,760	2,366	255	96	82	14	45	10	15	26
MS	152	10	142	2		2	2			
SC	718	491	141	37	32	5	25	3	7	2
Grand Total	**51,933**	**28,882**	**14,995**	**2,170**	**1,029**	**1,141**	**1,068**	**240**	**463**	**399**

Table 2. Ranges for annual sales categories reported in the survey and values used to estimate sales

Sales Range	Estimated Value	Sales Range	Estimated Value
Less than $250,000	$125,000	$5,000,000 to $9,999,9999	$7,500,000
$250,000 to $499,9999	$375,000	$10,000,000 to $14,999,999	$12,500,000
$500,000 to $999,999	$750,000	$15,000,000 to $19,999,999	$17,500,000
$1,000,000 to $1,999,999	$1,500,000	$20,000,000 to $29,999,999	$25,000,000
$2,000,000 to $2,999,999	$2,500,000	$30,000,000 to $39,999,999	$35,000,000
$3,000,000 to $3,999,999	$3,500,000	$40,000,000 to $49,999,999	$45,000,000
$4,000,000 to $4,999,999	$4,500,000	$50,000,000 or more	$50,000,000

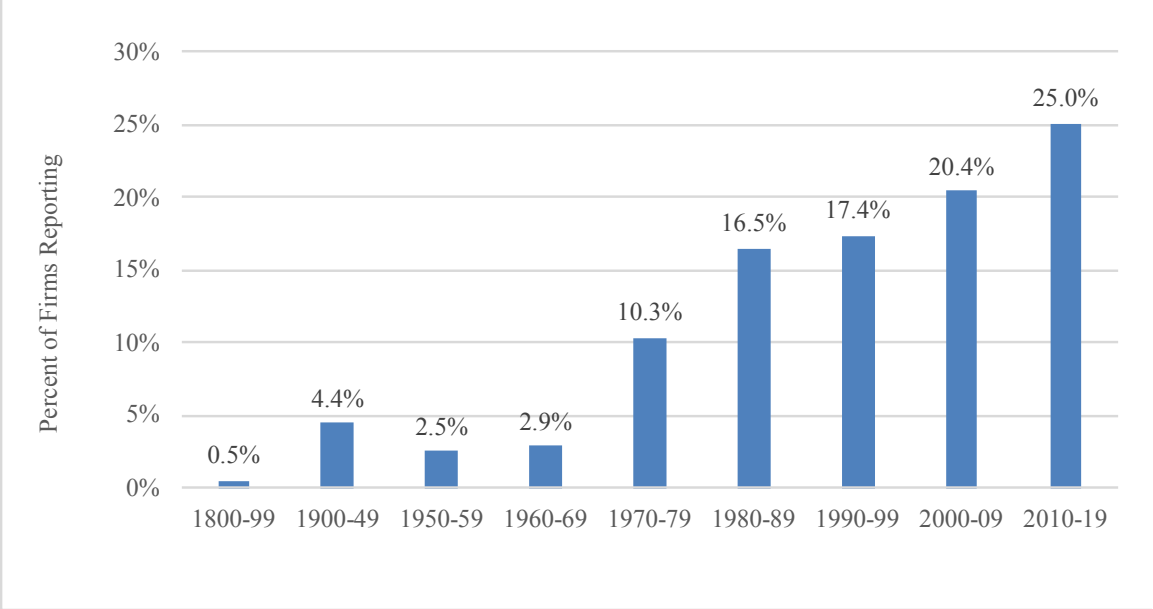
Note: Respondents selecting the $50 Mn or more range were further asked to provide the specific sales value. For responses where the specific was not provided, $50 Mn was used for calculations.

Results

Period of Establishment

The distribution of firm establishment date (by decade) of the surveyed firms is shown in Figure 2. One quarter (25%) of firms were established during 2010-18, while 20 percent were established during 2000-09, 17 percent during the 1990s, 17 percent during the 1980s, and 10 percent during the 1970s, with smaller shares in prior decades. With more than 60 percent of the firms established since the 1990s, this pattern reflects the turnover of firms in the industry with progressively fewer firms surviving from earlier periods. Cumulatively, about 10 percent of firms have been in existence since before the 1960s, including about one-half percent since the 1800s and 4 percent since the early 1900s. The percentage of firms established during the most recent period of 2010-19 (25%) is about 4 percent higher than the number of firms established during 2000-09, suggesting that the rate of new business formation has slightly increased. Based on other sources, it is well-accepted that a substantial number of firms exited the industry during the recession of 2008-09 and for a period several years after.

Figure 2. Distribution of surveyed U.S. Green industry firms by decade established



Annual Sales

Annual sales for 2018, as reported by 1,727 survey respondents, totaled $2.392 billion (Bn) and averaged $1.39 million (Mn) per firm (Table 3). Sales through wholesale market channels totaled $1.74 Bn and averaged $1.34 Mn per firm, while sales at retail totaled $474 Mn, averaging $0.53 Mn per firm. The

Southeast region had reported annual sales of $542 Mn, followed by the Midwest ($489 Mn), Pacific ($485 Mn), Southcentral ($280 Mn), Northeast ($276 Mn), Appalachian ($135 Mn), Mountain ($125 Mn) and Great Plains ($61 Mn). It should be noted that these are reported sales for the survey respondents only and they do not represent expanded sales for the entire industry. Average sales per firm were highest in the Pacific regions ($2.05 Mn) and Southcentral (nearly $2.00 Mn) regions, and lowest in the Northeast ($0.93 Mn) and Appalachian ($0.78 Mn) regions. Among individual states, average annual sales per firm were highest in Kansas ($5.86 Mn), Arizona ($5.57), Oklahoma ($5.37), Oregon ($3.43), and Idaho ($3.16). It is worth mentioning that Kansas, Arizona, and several other states (including Alaska, Arkansas, Connecticut, Massachusetts, Mississippi, Nevada, New Hampshire, Rhode Island, South Dakota, Utah, Vermont, and Wyoming) had less than 10 respondent firms. Retail sales represented 20 percent of overall annual sales reported and ranged from 7 percent (Southeast) to 73 percent (Great Plains) across regions.

Table 3. Annual sales reported by surveyed U.S. Green industry firms in 2018, by region and state

Region, State	Number of Firms Reporting Sales	Total Annual Sales (Mn$)	Average Sales Per Firm (Mn$)	Wholesale Sales (Mn$)	Average Wholesale Sales Per Firm (Mn$)	Retail Sales (Mn$)	Average Retail Sales Per Firm (Mn$)	Percentage of Sales at Retail
Appalachian	**173**	**135.4**	**0.782**	**92.5**	**0.675**	**40.2**	**0.468**	**29.7%**
KY	37	13.3	0.360	6.8	0.262	4.7	0.393	35.4%
NC	55	42.0	0.764	34.6	0.706	6.7	0.247	15.9%
TN	43	50.6	1.177	30.4	0.920	20.1	0.915	39.8%
VA	20	24.0	1.200	16.3	1.016	7.7	0.595	32.2%
WV	18	5.4	0.300	4.5	0.343	0.9	0.078	17.3%
Great Plains	**40**	**61.1**	**1.528**	**16.5**	**0.591**	**44.6**	**1.273**	**72.9%**
KS	9	52.7	5.857	11.4	2.284	41.3	5.162	78.3%
ND	10	1.7	0.173	0.8	0.138	0.9	0.100	52.1%
NE	18	5.0	0.280	3.6	0.256	1.5	0.097	29.0%
SD	3	1.6	0.540	0.7	0.241	0.9	0.299	55.4%
Midwest	**360**	**488.7**	**1.357**	**415.3**	**1.544**	**66.7**	**0.318**	**13.7%**
IA	25	20.7	0.828	17.1	1.140	1.5	0.123	7.1%
IL	28	19.7	0.704	11.9	0.700	5.2	0.273	26.3%
IN	53	54.7	1.032	45.0	1.046	9.6	0.301	17.6%
MI	91	208.4	2.290	190.7	2.578	16.6	0.378	8.0%
MN	17	35.4	2.081	34.7	2.313	0.5	0.061	1.6%
MO	19	21.9	1.153	13.2	0.940	8.8	0.730	40.0%
OH	65	81.5	1.253	66.7	1.418	14.5	0.322	17.8%

WI	62	46.4	0.748	36.0	0.819	10.0	0.271	21.6%
Mountain	**78**	**124.5**	**1.597**	**80.6**	**1.391**	**43.6**	**0.948**	**35.0%**
AZ	5	27.8	5.565	22.4	7.453	5.5	1.366	19.6%
CO	36	31.4	0.872	15.6	0.578	15.5	0.675	49.5%
ID	12	37.9	3.157	27.0	2.704	10.8	1.549	28.6%
MT	10	1.3	0.126	1.1	0.143	0.1	0.041	9.6%
NV	2	4.3	2.125	2.3	1.125	2.0	1.000	47.1%
UT	8	17.9	2.236	9.4	1.880	8.5	2.122	47.4%
WY	5	4.0	0.804	2.9	0.952	1.2	0.389	29.0%
Northeast	**297**	**275.9**	**0.929**	**190.0**	**0.896**	**40.7**	**0.250**	**14.8%**
CT	4	1.7	0.417	0.2	0.081	1.5	0.753	90.3%
DE	11	2.8	0.255	1.7	0.247	1.1	0.154	38.4%
MA	8	3.0	0.372	1.9	0.265	1.1	0.281	37.8%
MD	17	18.8	1.107	16.0	1.336	2.8	0.399	14.8%
ME	20	1.0	0.048	0.5	0.044	0.4	0.033	44.4%
NH	8	2.8	0.344	0.8	0.212	1.9	0.315	68.8%
NJ	33	39.5	1.195	35.9	1.434	3.6	0.326	9.1%
NY	106	71.0	0.670	48.8	0.677	12.2	0.210	17.2%
PA	76	124.0	1.631	74.0	1.213	15.0	0.318	12.1%
RI	6	10.4	1.734	9.6	2.400	0.8	0.201	7.7%
VT	8	1.1	0.139	0.6	0.104	0.4	0.091	32.8%
Pacific	**237**	**484.8**	**2.046**	**358.3**	**2.024**	**112.4**	**1.013**	**23.2%**
AK	3	1.0	0.333	0.3	0.125	0.8	0.750	75.0%
CA	134	232.9	1.738	148.3	1.440	75.1	1.138	32.2%
HI	12	8.2	0.685	3.3	0.363	0.3	0.066	4.0%
OR	64	219.4	3.427	183.4	4.585	35.9	0.972	16.4%
WA	24	23.4	0.974	23.1	1.004	0.3	0.137	1.2%
Southcentral	**140**	**279.5**	**1.996**	**88.6**	**0.798**	**85.2**	**1.167**	**30.5%**
AR	3	0.4	0.125	0.1	0.106	0.0	0.019	5.0%
LA	38	54.7	1.439	50.6	1.368	4.1	0.227	7.5%
NM	12	17.9	1.494	3.7	0.530	14.2	1.777	79.3%
OK	11	59.0	5.368	1.4	0.198	2.7	0.333	4.5%
TX	76	147.4	1.940	32.7	0.555	64.2	1.689	43.5%
Southeast	**402**	**542.3**	**1.349**	**498.6**	**1.614**	**40.1**	**0.246**	**7.4%**
AL	15	6.9	0.460	4.5	0.446	2.4	0.474	34.3%
FL	292	447.6	1.533	416.9	1.853	28.0	0.233	6.2%
GA	66	77.6	1.176	69.4	1.240	7.9	0.293	10.2%
MS	2	0.9	0.438	0.9	0.438	-	-	0.0%
SC	27	9.3	0.343	6.9	0.430	1.9	0.169	20.0%
Grand Total	**1,727**	**2,392.2**	**1.385**	**1,740.4**	**1.338**	**473.5**	**0.534**	**19.8%**

Note: Sales values are given in million dollars.

Employment

A total of 35,719 employees were reported for all U.S. Green industry survey respondents in 2018, including 20,631 (57.8%) permanent employees, 12,633 (35.4%) temporary, part-time or seasonal employees, and 2,455 (6.9%) foreign national employees authorized to work in the U.S under the H2A visa program (

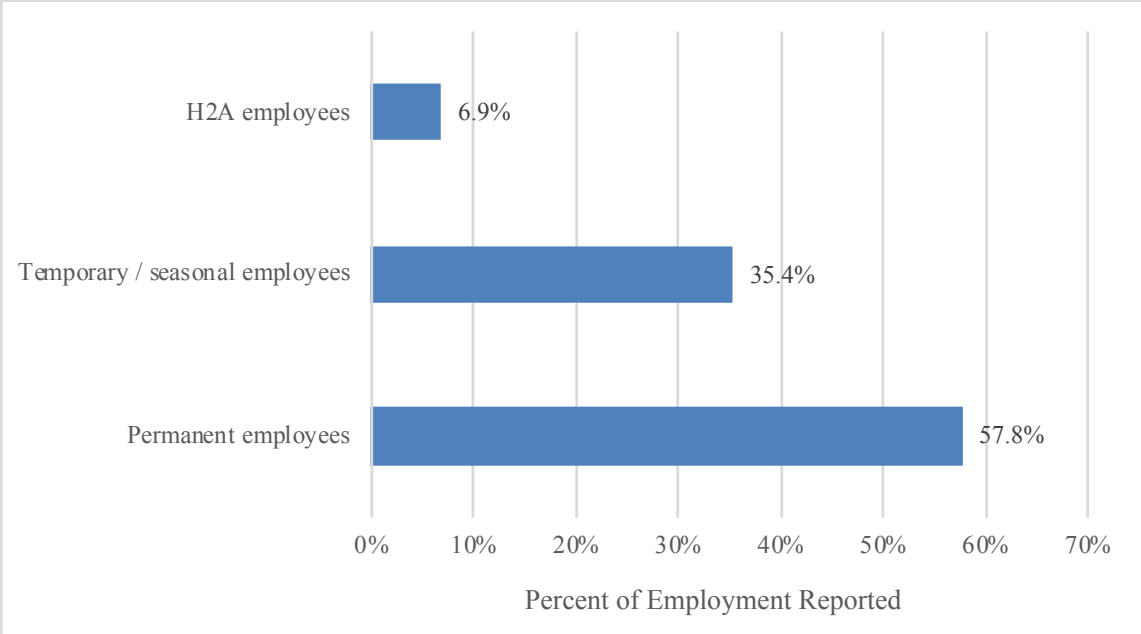
Table 4; Figure 3). The Southeast and Midwest regions had the highest employment reported with 10,474 and 9,162 employees, respectively, followed by the Pacific (5,509), Northeast (3,446), Appalachian (2,695), Southcentral (2,590), Mountain (1,558), and Great Plains (285), as shown in

Table 4.

The national average number of employees per firm was 20.8, including 11 fulltime/permanent employees, 7.5 temporary/part-time/seasonal, and 1.9 H2A employees (Table 5). The states with the highest average number of permanent employees were Massachusetts (42.4), Arizona (38.0), Oklahoma (26.6), Oregon (26.3), and Michigan (19.1). The states with the highest average number of temporary employees per firm, which can be taken as an indication of seasonality in the business as well as firm size, were Arizona (75.5), Michigan (20.9), Rhode Island (14.4), and Delaware (14.3), Table 5. States with the largest percentage of H2A employees, which may be an indication of labor shortages, were Ohio (16%), Arizona (15%), Florida (14%), Wisconsin (11%), and Rhode Island (10%),

Table 4.

Figure 3. Distribution of U.S. Green industry employment by employee type, 2018



More than two-thirds (71%) of firms reported that their number of fulltime/permanent employees had remained the same over the past five years, while 11 percent had decreased employment, and 19 percent had increased employment. For part-time/temporary/seasonal employees, a similar share of firms kept the same number of employees (68%), decreased (12%) or increased (20%) employment.

Table 4. Employment reported by surveyed U.S. Green industry firms in 2018, by region and state

Region, State	Firms Reporting Employment	Total Employment	Fulltime, Permanent Employees	Part-Time Temporary, Seasonal, Employees	H2A Employees	Percent Permanent Employees	Percent Part-Time, Temporary, Seasonal Employees	Percent H2A Employees
Appalachian	**171**	**2,695**	**1,323**	**1,233**	**139**	**49%**	**46%**	**5%**
KY	36	227	120	100	7	53%	44%	3%
NC	56	1,087	319	705	63	29%	65%	6%
TN	46	916	537	315	64	59%	34%	7%
VA	21	378	287	86	5	76%	23%	1%
WV	12	87	60	27	0	69%	31%	0%
Great Plains	**38**	**285**	**99**	**182**	**4**	**35%**	**64%**	**1%**

KS	9	84	45	39	0	54%	46%	0%
ND	8	71	12	58	1	17%	82%	1%
NE	17	81	31	47	3	38%	58%	4%
SD	4	49	11	38	0	22%	78%	0%
Midwest	**365**	**9,162**	**4,330**	**4,260**	**572**	**47%**	**46%**	**6%**
IA	25	278	142	136	0	51%	49%	0%
IL	28	286	140	146	0	49%	51%	0%
IN	61	777	492	282	3	63%	36%	0%
MI	100	4,504	2,097	2,261	146	47%	50%	3%
MN	17	399	223	152	24	56%	38%	6%
MO	20	281	142	119	20	51%	42%	7%
OH	66	1,806	847	675	284	47%	37%	16%
WI	48	831	247	489	95	30%	59%	11%
Mountain	**78**	**1,558**	**733**	**740**	**85**	**47%**	**47%**	**5%**
AZ	5	401	190	151	60	47%	38%	15%
CO	35	543	258	285	0	48%	52%	0%
ID	15	420	209	191	20	50%	45%	5%
MT	7	49	15	34	0	31%	69%	0%
NV	2	19	16	3		84%	16%	0%
UT	8	64	23	41	0	36%	64%	0%
WY	6	62	22	35	5	35%	56%	8%
Northeast	**257**	**3,446**	**1,615**	**1,692**	**139**	**47%**	**49%**	**4%**
CT	3	14	7	7	0	50%	50%	0%
DE	12	207	26	172	9	13%	83%	4%
MA	9	553	424	129	0	77%	23%	0%
MD	13	215	133	70	12	62%	33%	6%
ME	21	69	31	37	1	45%	54%	1%
NH	7	60	41	19	0	68%	32%	0%
NJ	31	395	197	198	0	50%	50%	0%
NY	80	933	395	465	73	42%	50%	8%
PA	66	843	313	498	32	37%	59%	4%
RI	6	118	34	72	12	29%	61%	10%
VT	9	39	14	25	0	36%	64%	0%
Pacific	**213**	**5,509**	**3,637**	**1,723**	**149**	**66%**	**31%**	**3%**
AK	3	26	3	23	0	12%	88%	0%
CA	116	2,496	1,505	895	96	60%	36%	4%
HI	12	100	82	18	0	82%	18%	0%
OR	63	2,520	1,917	550	53	76%	22%	2%
WA	19	367	130	237	0	35%	65%	0%

Southcentral	**139**	**2,590**	**2,087**	**466**	**37**	**81%**	**18%**	**1%**
AR	3	5	3	2		60%	40%	0%
LA	45	426	263	130	33	62%	31%	8%
NM	11	199	107	92	0	54%	46%	0%
OK	16	502	453	47	2	90%	9%	0%
TX	64	1,458	1,261	195	2	86%	13%	0%
Southeast	**456**	**10,474**	**6,807**	**2,337**	**1330**	**65%**	**22%**	**13%**
AL	15	87	70	17	0	80%	20%	0%
FL	332	9,190	5,893	2,003	1294	64%	22%	14%
GA	81	1,018	749	247	22	74%	24%	2%
MS	2	23	13	10	0	57%	43%	0%
SC	26	156	82	60	14	53%	38%	9%
Grand Total	**1,717**	**35,719**	**20,631**	**12,633**	**2,455**	**58%**	**35%**	**7%**

Table 5. Average number of employees per firm for U.S. Green industry survey respondents in 2018, by region and state

Region, State	Total Employees	Fulltime or Permanent	Part-time or Seasonal	H2A Workers
	Number of Employees			
Appalachian	**15.8**	**7.4**	**7.3**	**1.1**
KY	6.3	4.0	2.9	0.4
NC	19.4	5.5	13.1	1.5
TN	19.9	10.5	6.8	1.4
VA	18.0	12.0	4.1	0.4
WV	7.3	3.8	1.9	0.0
Great Plains	**7.5**	**2.4**	**4.8**	**0.2**
KS	9.3	5.0	6.5	0.0
ND	8.9	1.3	6.4	0.3
NE	4.8	1.6	2.5	0.2
SD	12.3	2.8	9.5	0.0
Midwest	**25.1**	**11.2**	**11.2**	**2.1**
IA	11.1	6.2	6.5	0.0
IL	10.2	5.6	7.0	0.0
IN	12.7	7.3	4.1	0.0
MI	45.0	19.1	20.9	1.5

MN	23.5	14.9	8.9	3.0
MO	14.1	8.4	6.0	1.7
OH	27.4	11.8	9.4	4.7
WI	17.3	4.4	9.1	4.1
Mountain	**20.0**	**9.2**	**9.5**	**1.3**
AZ	80.2	38.0	75.5	60.0
CO	15.5	6.8	7.5	0.0
ID	28.0	13.1	11.9	1.3
MT	7.0	2.1	3.8	0.0
NV	9.5	8.0	3.0	
UT	8.0	3.8	6.8	0.0
WY	10.3	3.7	5.8	1.0
Northeast	**13.4**	**5.8**	**6.2**	**0.8**
CT	4.7	2.3	1.8	0.0
DE	17.3	2.0	14.3	0.8
MA	61.4	42.4	11.7	0.0
MD	16.5	8.3	4.7	1.1
ME	3.3	1.2	1.3	0.0
NH	8.6	5.1	2.1	0.0
NJ	12.7	5.5	7.6	0.0
NY	11.7	4.5	5.7	1.6
PA	12.8	5.0	7.0	0.8
RI	19.7	6.8	14.4	6.0
VT	4.3	1.4	2.3	0.0
Pacific	**25.9**	**15.3**	**10.0**	**1.3**
AK	8.7	1.5	7.7	0.0
CA	21.5	11.9	12.4	2.7
HI	8.3	6.8	3.0	0.0
OR	40.0	26.3	7.4	0.8
WA	19.3	5.7	13.9	0.0
Southcentral	**18.6**	**13.6**	**3.7**	**0.4**
AR	1.7	1.5	2.0	
LA	9.5	5.4	2.6	0.8
NM	18.1	9.7	9.2	0.0
OK	31.4	26.6	3.4	0.2
TX	22.8	16.8	3.8	0.1
Southeast	**23.0**	**13.2**	**5.1**	**3.2**

AL	5.8	4.1	1.3	0.0
FL	27.7	15.4	6.0	4.3
GA	12.6	9.0	3.3	0.3
MS	11.5	6.5	5.0	0.0
SC	6.0	2.5	1.9	0.5
Grand Total	**20.8**	**11.0**	**7.5**	**1.9**

Firm Size Distribution

Annual sales were reported in the survey either as a specific amount or as a range, from less than $250,000 to more than $50 million (Table 2). Over half (63.5%) of the respondents were firms with less than $250,000 in annual sales, while 18.1 percent of firms had sales of $250,000 to $999,000, 13.6 percent had sales of $1 to $4.9 Mn, 2.3 percent had sales of $5 to 9.9 Mn, and 2.5 percent of firms had annual sales of $10 Mn or higher, including 0.4 percent with sales $50 Mn or more (Figure 4). Approximately 20 percent of firms did not report annual sales. Two states where all surveyed firms reported less than $250,000 in annual sales were Maine and Arkansas (Table 6). The states with the highest percentage of firms reporting $10 Mn or higher in annual sales were Arizona (40%), Kansas (11.1%), Oklahoma (9.1%), New Mexico (8.3%), Idaho (8.3%), and Oregon (6.3%), as shown in Table 6.

Figure 4. Distribution of annual sales reported by U.S. Green industry firms in 2018

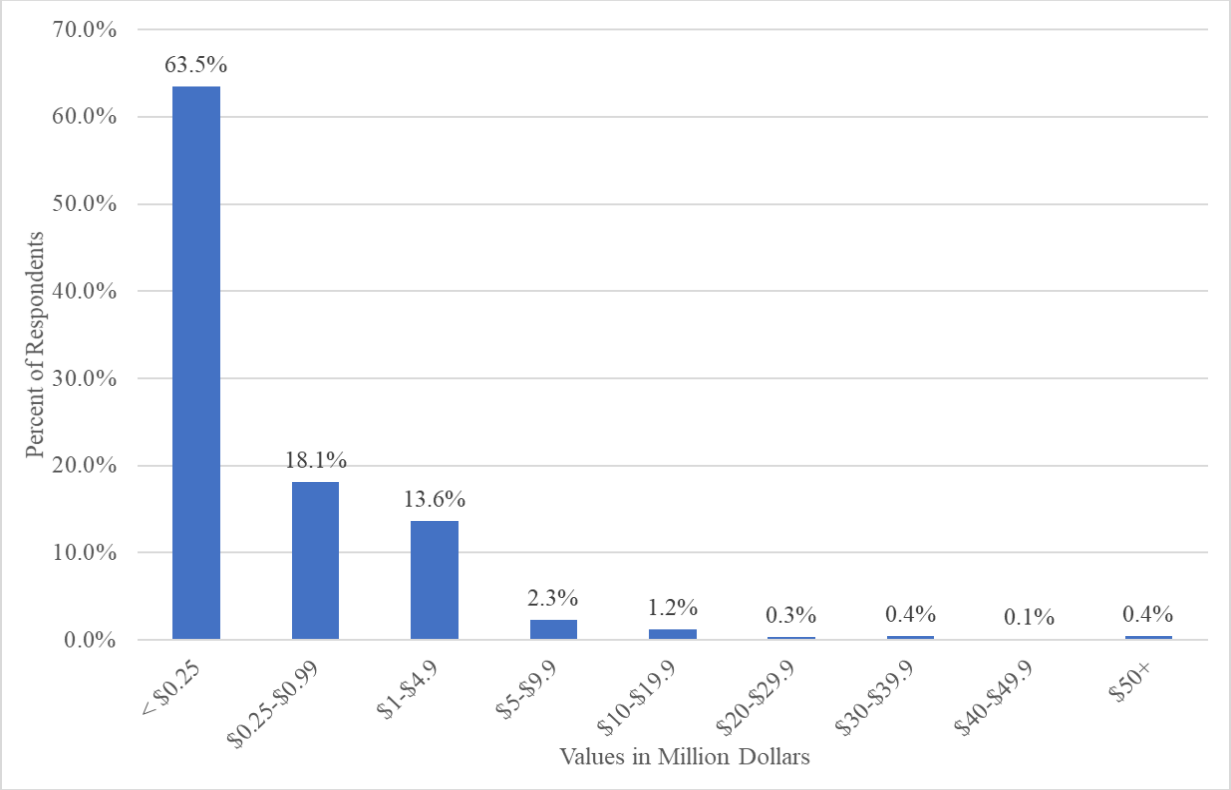


Table 6. Distribution of annual sales in 2018 reported by U.S. Green industry firms, by state and region

Region, State	Less than $0.25 Mn	$0.25-$0.99 Mn	$1-$4.9 Mn	$5-$9.9 Mn	$10-$19.9 Mn	$20-$29.9 Mn	$30-$39.9 Mn	$40-$49.9 Mn	$50+ Mn	$10+ Mn
	Percent of Firms									
Appalachian	**62.4**	**20.2**	**13.9**	**2.9**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**
KY	67.6	18.9	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	60.0	20.0	18.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0
TN	58.1	20.9	14.0	4.7	2.3	0.0	0.0	0.0	0.0	2.3
VA	50.0	30.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
WV	83.3	11.1	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Great Plains	**67.5**	**25.0**	**5.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.5**	**2.5**
KS	66.7	11.1	11.1	0.0	0.0	0.0	0.0	0.0	11.1	11.1
ND	70.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NE	72.2	22.2	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SD	33.3	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Midwest	**64.2**	**15.8**	**15.8**	**1.1**	**1.7**	**0.3**	**0.6**	**0.0**	**0.6**	**3.1**
IA	60.0	24.0	12.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
IL	64.3	10.7	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IN	71.7	7.5	15.1	1.9	3.8	0.0	0.0	0.0	0.0	3.8
MI	53.8	24.2	16.5	1.1	1.1	0.0	1.1	0.0	2.2	4.4
MN	82.4	0.0	11.8	0.0	0.0	0.0	5.9	0.0	0.0	5.9
MO	57.9	5.3	36.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OH	66.2	16.9	12.3	0.0	3.1	1.5	0.0	0.0	0.0	4.6
WI	69.4	16.1	11.3	1.6	1.6	0.0	0.0	0.0	0.0	1.6
Mountain	**55.1**	**14.1**	**16.7**	**10.3**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**	**3.8**
AZ	20.0	20.0	0.0	20.0	40.0	0.0	0.0	0.0	0.0	40.0
CO	72.2	5.6	13.9	8.3	0.0	0.0	0.0	0.0	0.0	0.0
ID	16.7	25.0	33.3	16.7	8.3	0.0	0.0	0.0	0.0	8.3
MT	80.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NV	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UT	37.5	25.0	12.5	25.0	0.0	0.0	0.0	0.0	0.0	0.0
WY	60.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northeast	**70.4**	**16.2**	**10.4**	**1.0**	**0.3**	**1.0**	**0.7**	**0.0**	**0.0**	**2.0**
CT	75.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DE	81.8	9.1	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MA	50.0	37.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MD	47.1	17.6	29.4	5.9	0.0	0.0	0.0	0.0	0.0	0.0
ME	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NH	62.5	25.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NJ	51.5	36.4	9.1	0.0	0.0	3.0	0.0	0.0	0.0	3.0
NY	74.5	15.1	7.5	0.9	0.9	0.9	0.0	0.0	0.0	1.9
PA	69.7	13.2	13.2	0.0	0.0	1.3	2.6	0.0	0.0	3.9
RI	66.7	0.0	16.7	16.7	0.0	0.0	0.0	0.0	0.0	0.0
VT	87.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific	**56.1**	**21.5**	**14.8**	**3.8**	**1.7**	**0.4**	**0.8**	**0.4**	**0.4**	**3.8**
AK	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA	53.7	26.1	11.9	4.5	1.5	0.7	1.5	0.0	0.0	3.7
HI	75.0	8.3	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OR	60.9	14.1	15.6	3.1	3.1	0.0	0.0	1.6	1.6	6.3
WA	45.8	20.8	29.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0
Southcentral	**59.3**	**21.4**	**12.9**	**2.9**	**0.7**	**0.0**	**0.7**	**0.7**	**1.4**	**3.6**

AR	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LA	60.5	21.1	13.2	2.6	0.0	0.0	2.6	0.0	0.0	2.6
NM	50.0	25.0	16.7	0.0	8.3	0.0	0.0	0.0	0.0	8.3
OK	54.5	27.3	9.1	0.0	0.0	0.0	0.0	0.0	9.1	9.1
TX	59.2	21.1	13.2	3.9	0.0	0.0	0.0	1.3	1.3	2.6
Southeast	**65.4**	**17.4**	**13.7**	**1.7**	**1.2**	**0.2**	**0.0**	**0.0**	**0.2**	**1.7**
AL	60.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FL	68.8	14.0	13.0	2.4	1.4	0.0	0.0	0.0	0.3	1.7
GA	47.0	31.8	18.2	0.0	1.5	1.5	0.0	0.0	0.0	3.0
MS	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SC	77.8	14.8	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grand Total	**63.5**	**18.1**	**13.6**	**2.3**	**1.2**	**0.3**	**0.4**	**0.1**	**0.4**	**2.5**

Note: Categories are denominated in million dollars.

Ornamental Plant Types

The distribution of eighteen major ornamental plant types sold in 2018 by U.S. Green industry firms is summarized as the share of total sales reported in Figure 5. Nationally, across all industry groups, the largest specific plant type sold was bedding plant-flowering annuals, representing 12.4 percent of total sales reported. Miscellaneous other non-specific plants represented 12.9 percent of sales. The second tier of plant types as a share of sales were herbaceous perennials (8.0%), deciduous shade/flowering trees (7.9%), evergreen trees (7.8%), liners, cuttings, and plugs (7.5%), deciduous shrubs (6.2%), and broad-leaved evergreen shrubs (5.8%). The third tier of plant types included bedding plants-vegetables, fruits, and herbs (5.3%), flowering potted plants (4.8%), roses (4.5%), and tropical foliage (4.3%). Plant types that represented less than 4 percent of sales were fruit trees (3.8%), narrow-leaved evergreen shrubs (3.3%), vines and ground covers (3.1%), sod (1.3%), and Christmas trees (0.8%). Plant types that increased as a share of sales since the previous survey for 2013 were liners, cuttings, plugs, tropical foliage, flowering potted plants, roses, evergreen trees, narrow-leaved evergreen shrubs, and broad-leaved evergreen shrubs.

Plant type sales are summarized by state/region in Table 7. Plant types that had an above national average percentage of total regional sales were flowering annual bedding plants in the Midwest (22%), Great Plains (19%), Northeast (15%), and Southcentral (10%), deciduous shade and flowering trees in the Mountain (19%), Great Plains (17%), Appalachian (12%), and Southeast (10%), deciduous shrubs in the Great Plains (10%) Appalachian (9%), and Southcentral (9%), evergreen trees in the Northeast (21%),

Great Plains (14%), Mountain (11%), and Appalachian (10%), roses in the Northeast (17%) and Mountain (15%), herbaceous perennials in the Midwest (15%), Appalachian (12%), and Great Plains (10%), vegetables, fruits, and herbs in the Pacific (10%) and Great Plains (9%), flowering potted plants in the Midwest (10%), fruit trees in the Pacific (13%), tropical foliage in the Southeast (18%), propagated materials (liners, cuttings, plugs, etc.) in the Pacific (14%), and miscellaneous other plant types in the Southcentral (29%), and Pacific (24%) regions.

Figure 5. Distribution of U.S. Green industry sales by plant types in 2018

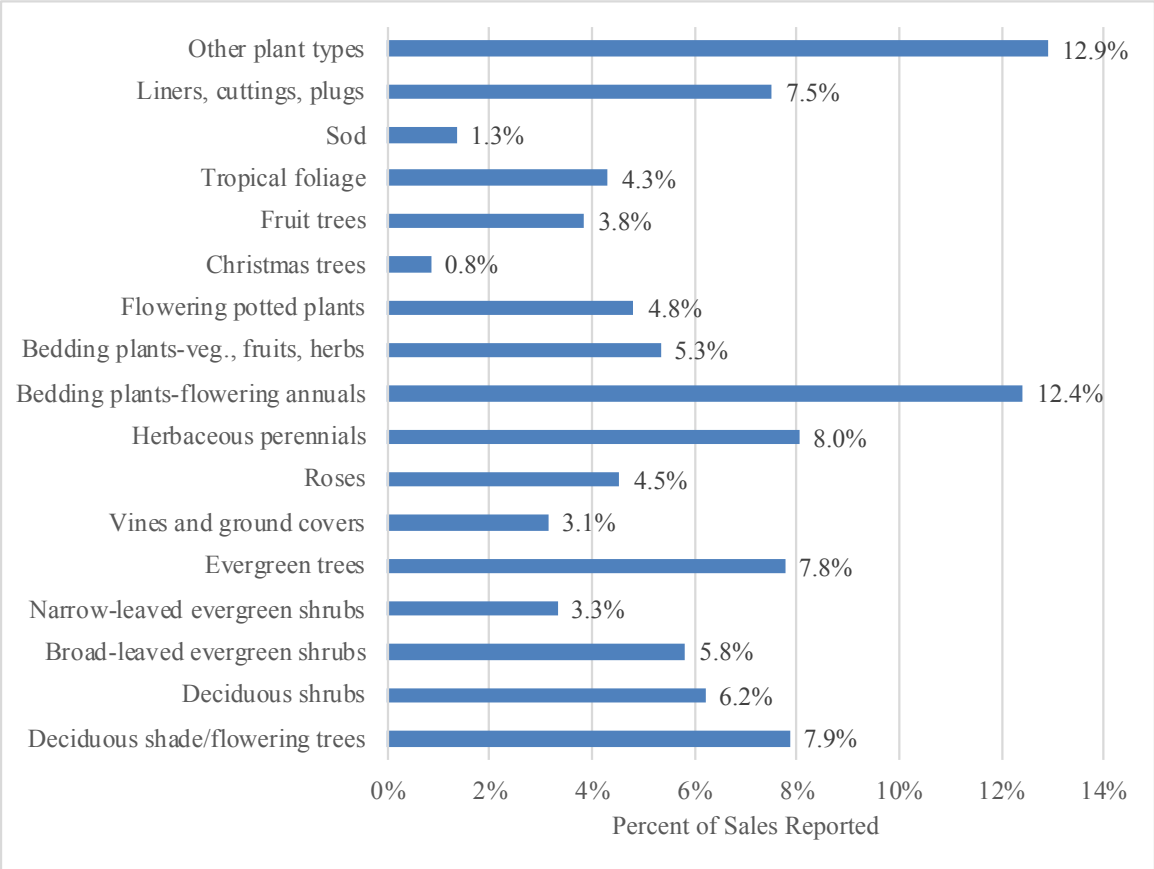


Table 7. Distribution of ornamental plant types sold by Green industry firms in U.S. states and regions in 2018

Region, State	Deciduous shade and flowering trees	Deciduous shrubs	Broad-leaved evergreen shrubs	Narrow-leaved evergreen shrubs	Evergreen trees	Vines and ground covers	Roses	Herbaceous perennials	Bedding plants-flowering annuals
	Percent of Total Sales								

Appalachian	**11.6**	**8.6**	**11.5**	**3.9**	**9.7**	**1.7**	**1.5**	**12.1**	**8.2**
KY	14.2	6.7	4.6	3.7	0.9	0.5	0.8	1.3	30.9
NC	9.7	4.1	12.6	3.4	3.7	2.9	1.0	22.0	2.9
TN	12.1	7.4	7.5	2.7	7.9	1.5	1.2	11.6	8.5
VA	15.0	18.7	18.0	6.1	27.0	0.7	3.1	2.6	3.1
WV	3.4	3.5	2.2	2.5	1.4	0.4	0.2	4.6	22.2
Great Plains	**16.9**	**9.6**	**4.5**	**0.7**	**13.8**	**1.1**	**2.9**	**10.1**	**19.4**
KS	25.3	7.3	5.6	1.1	5.6	0.6	2.0	3.7	18.2
ND	10.1	6.2	3.7	0.4	39.6	1.3	2.9	3.1	10.4
NE	13.3	13.0	6.1	0.6	11.0	1.4	3.4	16.3	25.9
SD	17.8	9.5	0.0	0.6	5.9	0.8	3.3	14.7	17.3
Midwest	**6.9**	**7.4**	**3.3**	**3.0**	**3.5**	**1.8**	**1.9**	**14.8**	**21.8**
IA	7.5	2.6	0.1	0.1	1.9	0.7	0.2	2.2	18.0
IL	10.5	8.5	4.0	4.5	8.0	1.4	3.7	6.6	11.2
IN	19.3	15.1	7.2	7.2	4.5	1.1	1.2	7.3	6.2
MI	1.3	2.6	0.9	0.9	1.7	2.4	0.3	21.8	38.9
MN	3.2	1.6	0.7	0.4	5.4	0.0	0.0	1.2	0.5
MO	13.2	14.6	14.6	3.0	8.7	0.9	1.7	12.0	14.6
OH	12.9	17.4	6.9	6.6	2.8	1.2	3.7	15.3	4.1
WI	14.1	14.1	5.6	7.0	6.5	2.5	8.2	10.3	7.2
Mountain	**19.1**	**6.6**	**4.2**	**3.2**	**11.1**	**4.5**	**14.9**	**4.5**	**8.2**
AZ	13.2	2.7	8.8	6.9	11.9	10.0	35.9	1.9	0.0
CO	17.4	11.6	2.8	1.5	16.1	0.5	4.5	12.6	9.7
ID	57.6	11.3	0.2	0.0	13.5	2.8	2.2	2.0	7.4
MT	0.5	0.7	0.0	0.0	0.2	0.4	0.7	5.9	29.3
NV	5.0	0.0	0.0	0.0	10.0	0.0	5.0	0.0	20.0
UT	13.3	6.3	1.0	1.0	5.1	1.4	0.2	2.1	17.5
WY	0.3	0.3	0.0	0.0	0.3	0.0	2.7	5.5	31.1
Northeast	**6.9**	**6.0**	**5.3**	**3.2**	**20.8**	**1.8**	**17.0**	**6.8**	**14.8**
CT	4.5	13.5	9.0	0.0	0.0	0.9	9.0	0.4	37.5
DE	2.4	8.4	0.6	0.6	0.6	0.6	0.0	10.7	5.9
MA	5.1	0.0	0.0	0.0	12.0	0.0	0.0	3.3	20.8
MD	26.8	15.1	5.2	5.1	2.7	0.0	2.3	3.9	8.1
ME	15.1	6.0	0.0	0.0	14.6	1.8	0.3	27.0	23.7
NH	2.8	2.8	2.8	0.8	0.9	0.8	2.8	12.8	17.6
NJ	15.0	10.6	21.4	7.6	3.9	6.7	7.8	20.2	3.4
NY	3.0	2.8	1.4	1.8	4.9	1.8	4.1	6.3	37.6
PA	2.7	4.1	0.9	1.0	41.8	0.3	32.6	2.2	7.6
RI	4.5	16.8	25.0	42.1	5.6	0.0	0.0	0.9	0.0

VT	29.3	15.6	0.4	3.8	0.0	0.6	0.9	6.3	22.0
Pacific	**5.9**	**4.0**	**2.7**	**2.8**	**3.3**	**1.8**	**1.4**	**3.5**	**8.0**
AK	5.3	6.0	0.0	0.0	0.0	0.0	2.3	1.1	30.0
CA	4.3	2.3	2.4	1.6	1.5	2.6	2.1	1.0	6.5
HI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
OR	9.1	7.4	3.2	5.5	4.2	0.7	0.2	8.2	7.9
WA	7.9	4.8	3.9	2.5	18.2	0.9	0.8	6.5	25.6
Southcentral	**5.8**	**8.8**	**8.6**	**2.2**	**6.8**	**7.9**	**1.3**	**5.9**	**9.8**
AR	30.0	7.5	33.5	0.0	1.5	2.5	0.0	25.0	0.0
LA	0.9	19.7	4.6	0.7	0.8	25.3	0.3	0.3	5.5
NM	7.6	8.2	1.5	7.4	6.3	6.0	2.9	10.8	24.9
OK	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.4	1.9
TX	11.3	9.0	17.0	3.3	14.1	4.7	2.3	11.2	14.3
Southeast	**9.8**	**4.3**	**11.2**	**5.7**	**8.5**	**4.7**	**3.3**	**6.5**	**6.9**
AL	25.5	2.7	14.8	6.7	27.4	9.3	5.2	1.4	0.6
FL	7.8	2.2	6.1	4.2	7.3	3.1	0.8	7.7	6.2
GA	11.7	9.6	22.2	9.1	10.1	8.1	9.2	3.7	8.4
MS	0.0	0.0	0.0	0.0	0.0	0.1	0.5	3.4	74.1
SC	31.2	4.6	25.4	5.2	7.4	7.0	1.2	10.4	2.5
Grand Total	**7.9**	**6.2**	**5.8**	**3.3**	**7.8**	**3.1**	**4.5**	**8.0**	**12.4**

Table 7 **(**continued**)**. Distribution of ornamental plant types sold by Green industry firms in U.S. states and regions in 2018

Region, State	Bedding plants-vegetables, fruits, and herbs	Flowering potted plants	Christmas trees	Fruit trees	Tropical foliage	Sod	Propagated material (liners, cuttings, plug, etc.)	Other plant types
				Percent of Total Sales				
Appalachian	**3.9**	**2.6**	**3.0**	**4.3**	**2.5**	**1.4**	**12.2**	**1.5**
KY	6.4	10.1	0.3	1.2	3.1	0.0	15.4	0.1
NC	3.2	1.7	5.8	0.1	0.6	3.2	21.8	1.4
TN	3.3	2.2	0.3	22.4	2.7	0.2	7.9	0.6
VA	2.8	0.9	1.4	0.1	0.0	0.0	0.4	0.1
WV	11.0	1.5	3.4	0.3	27.4	0.8	0.3	14.9
Great Plains	**9.2**	**5.2**	**1.0**	**2.7**	**1.3**	**0.0**	**0.0**	**1.7**

KS	21.2	0.6	1.1	2.3	2.9	0.0	0.0	2.4
ND	6.5	3.3	2.2	7.2	0.3	0.0	0.0	2.8
NE	1.7	5.2	0.6	0.0	1.2	0.0	0.0	0.2
SD	8.5	14.7	0.4	4.0	0.1	0.0	0.0	2.5
Midwest	**5.7**	**9.7**	**1.0**	**0.9**	**1.7**	**3.2**	**4.1**	**9.4**
IA	3.8	39.8	0.6	0.6	5.0	0.0	15.5	1.4
IL	10.0	4.2	1.6	0.3	0.8	13.6	0.6	10.5
IN	1.8	5.5	0.3	0.5	0.7	21.6	0.0	0.4
MI	1.9	11.8	1.6	0.0	0.4	0.3	7.0	6.5
MN	0.6	17.3	0.0	0.1	8.6	0.0	0.0	60.3
MO	5.4	3.0	0.4	1.9	4.4	0.7	0.0	0.9
OH	25.6	1.1	0.4	0.0	0.3	0.0	0.0	1.7
WI	3.3	1.3	0.6	6.8	2.2	7.4	1.5	1.4
Mountain	**8.2**	**3.1**	**0.2**	**0.4**	**2.9**	**2.3**	**0.3**	**6.2**
AZ	0.0	0.0	0.0	0.0	0.0	0.0	0.8	8.0
CO	8.9	8.1	0.9	0.4	3.7	0.0	0.1	1.2
ID	0.5	1.7	0.0	0.4	0.0	0.0	0.0	0.4
MT	19.0	0.6	0.0	0.1	0.0	0.0	0.1	42.3
NV	50.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
UT	21.6	4.2	0.0	0.4	8.4	9.5	0.0	8.0
WY	12.4	2.7	0.0	0.5	1.1	0.0	0.0	43.0
Northeast	**3.7**	**7.4**	**1.4**	**0.3**	**0.6**	**0.6**	**1.5**	**1.9**
CT	4.3	5.2	15.7	0.0	0.0	0.0	0.0	0.0
DE	2.4	1.1	8.0	0.0	0.0	0.0	58.8	0.1
MA	3.4	46.7	0.0	0.0	3.0	0.0	0.0	5.7
MD	1.9	5.1	0.0	0.2	0.0	6.1	6.1	11.4
ME	6.1	0.7	0.9	0.0	0.1	0.0	0.0	3.6
NH	13.9	10.2	6.6	2.0	11.5	0.0	0.0	11.7
NJ	1.3	0.9	0.4	0.1	0.0	0.0	0.0	0.7
NY	8.8	18.8	1.9	0.9	1.5	0.7	1.1	2.6
PA	1.8	3.5	1.2	0.0	0.1	0.0	0.1	0.1
RI	0.0	0.0	4.3	0.0	0.0	0.0	0.8	0.0
VT	8.5	1.8	1.6	0.1	0.0	0.0	9.1	0.0
Pacific	**9.6**	**2.1**	**0.6**	**12.6**	**3.4**	**0.2**	**14.0**	**24.1**
AK	42.5	0.0	0.0	0.0	0.4	0.0	0.0	12.5
CA	13.6	1.9	0.0	20.5	2.8	0.1	2.9	33.9
HI	1.4	10.0	0.0	0.1	57.5	0.0	0.6	28.7

OR	2.8	0.3	2.0	0.7	1.3	0.1	39.1	7.5
WA	5.7	11.1	0.0	0.0	0.4	2.0	1.0	8.7
Southcentral	**2.2**	**0.8**	**0.4**	**0.9**	**0.8**	**0.7**	**8.4**	**28.6**
AR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LA	1.3	0.5	0.2	0.4	0.2	0.3	39.0	0.0
NM	12.7	0.3	3.0	5.5	1.0	0.0	0.0	2.0
OK	1.0	0.3	0.0	0.0	0.1	1.4	0.0	93.8
TX	1.7	1.5	0.4	0.9	1.6	0.6	0.4	5.7
Southeast	**1.9**	**3.8**	**0.1**	**1.5**	**18.0**	**1.0**	**8.3**	**4.5**
AL	0.4	1.6	0.0	4.2	0.3	0.0	0.0	0.0
FL	1.7	5.1	0.1	2.1	26.7	1.0	11.3	6.4
GA	2.3	0.9	0.0	0.1	0.1	1.1	2.5	0.7
MS	7.3	12.4	0.0	0.0	2.1	0.0	0.0	0.0
SC	2.7	0.3	0.2	0.1	0.1	0.0	0.2	1.5
Grand Total	**5.3**	**4.8**	**0.8**	**3.8**	**4.3**	**1.3**	**7.5**	**12.9**

Native Plants

Native plants are commonly defined as plants that were present in a state or local area before European settlement. In recent years, there has been increasing emphasis on using native plants for landscaping because they may be well adapted to the prevailing environmental conditions, require less maintenance, and are less likely to become invasive. For the U.S. overall, native plants represented 9.1 percent of total sales reported by survey respondents for 2018. In the previous national survey for 2013, native plants represented 17.1 percent of total sales, suggesting that native plants are declining in popularity. The share of total sales of native plants in each state and region are shown in Table 8. The states with the highest reported share of sales in native plants were Arkansas (47%), Pennsylvania (35%), Arizona (34%), Ohio (32%), Maryland (32%), Virginia (27%), and Alabama (25%). Across regions, native plant sales ranged from 23 percent in the Northeast to 1 percent in the Great Plains region.

Table 8. Native plants sales as a percentage of total sales by Green industry firms in U.S. states and regions in 2018

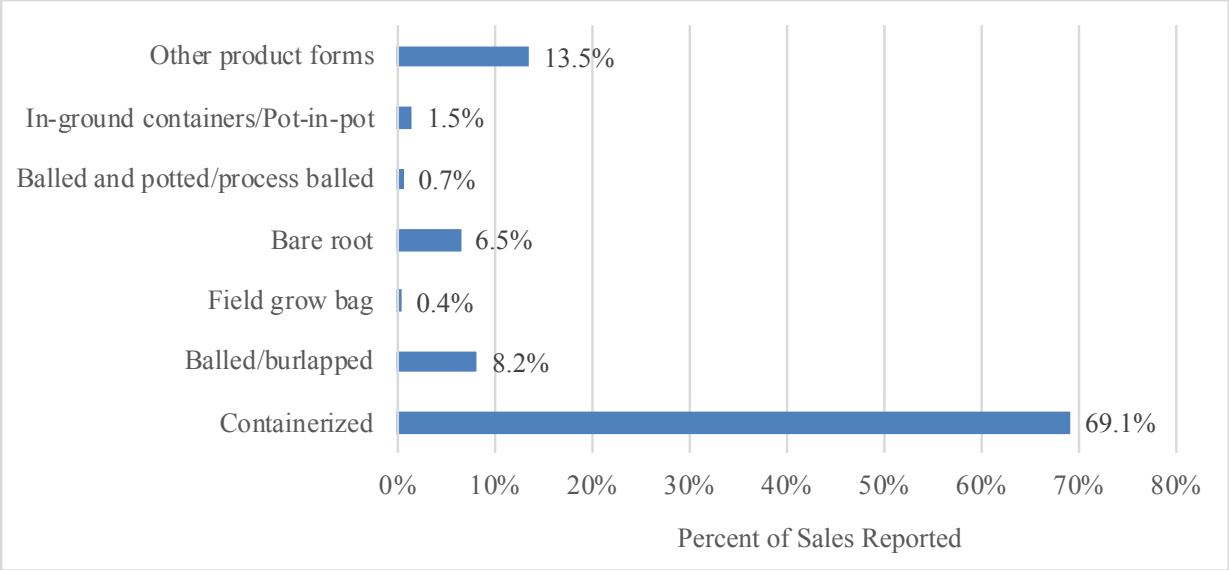
Region, State	Percent of Total Sales	Region, State	Percent of Total Sales	Region, State	Percent of Total Sales

Appalachian	**12.5**	**Mountain**	**10.9**	**Pacific**	**3.5**
KY	18.6	AZ	33.5	AK	0.1
NC	14.2	CO	9.6	CA	4.4
TN	3.4	ID	0.8	HI	0.5
VA	27.1	MT	0.7	OR	1.4
WV	5.3	NV	0.0	WA	15.1
Great Plains	**0.8**	UT	5.1	**Southcentral**	**6.0**
KS	0.1	WY	0.4	AR	46.7
ND	12.2	**Northeast**	**23.0**	LA	1.1
NE	4.7	CT	6.7	NM	4.7
SD	2.2	DE	8.9	OK	0.2
Midwest	**10.8**	MA	6.3	TX	10.3
IA	2.4	MD	32.3	**Southeast**	**6.9**
IL	14.8	ME	23.2	AL	24.9
IN	5.5	NH	10.3	FL	5.6
MI	6.3	NJ	22.3	GA	12.5
MN	1.3	NY	4.4	MS	0.0
MO	8.0	PA	35.3	SC	8.9
OH	32.0	RI	3.7		
WI	10.4	VT	14.7		
				Grand Total	**9.1**

Nursery Product Forms

Respondents were asked to indicate the percentage distribution of their sales by product form (root packaging media), including containerized, balled and burlapped, field grow bag, bare root, balled and potted/process balled, in-ground containers (including pot-in-pot), and other types (e.g., cut trees, budwood, scions, seeds, tissue culture plantlets, unrooted cuttings). Container-grown plants were the dominant product form reported in the survey, representing 69 percent of overall sales (Figure 6). The second tier of product forms included balled and burlapped (8.2% of sales), bare root (6.5%), and miscellaneous other forms (13.5%). In-ground containers/pot-in- pot systems, balled/potted plants, and field grow bags had less than 2 percent market share. The share for containerized products decreased by 4 percentage points compared with the previous national survey for 2013. All other specific product forms stayed relatively the same compared with the previous results, except miscellaneous which increased by 5 percent.

Figure 6. Distribution of ornamental plant product forms sold by Green industry firms in the U.S. in 2018



Containerized products constituted over 90 percent of sales in West Virginia, Kansas, South Dakota, Montana, Nevada, Utah, Wyoming, Connecticut, Hawaii, Arkansas, Louisiana, New Mexico, Oklahoma, Georgia and Mississippi, as shown in Table 9. Balled/burlapped products represented over 40 percent of sales in Indiana (41%), Idaho (57%), Rhode Island (75%), Vermont (43%), Alabama (46%), and South Carolina (48%). Balled/burlapped plants were a significant share of sales in Rhode Island (75%) and Idaho (57%). Bare root products were significant in North Dakota (51%) and Delaware (59%). In-ground containers, field grown bag, and in-ground containers/pot-in-pot systems were not more than 10 percent in any state. Various other non-specific product forms were an important share of sales in North Carolina (43%), Pennsylvania (51%), and Minnesota (60%).

Table 9. Distribution of sales of nursery product forms by Green industry firms in U.S. states and regions in 2018

Region, State	Containerized	Balled/ burlapped	Field grow bag	Bare root	Balled and potted/process balled	In-ground containers/ Pot-in-pot	Other product forms
			Percent of Total Sales				
Appalachian	**58.5**	**13.9**	**0.4**	**6.2**	**0.6**	**2.5**	**17.9**
KY	74.8	12.8	2.2	0.7	2.6	0.4	6.5

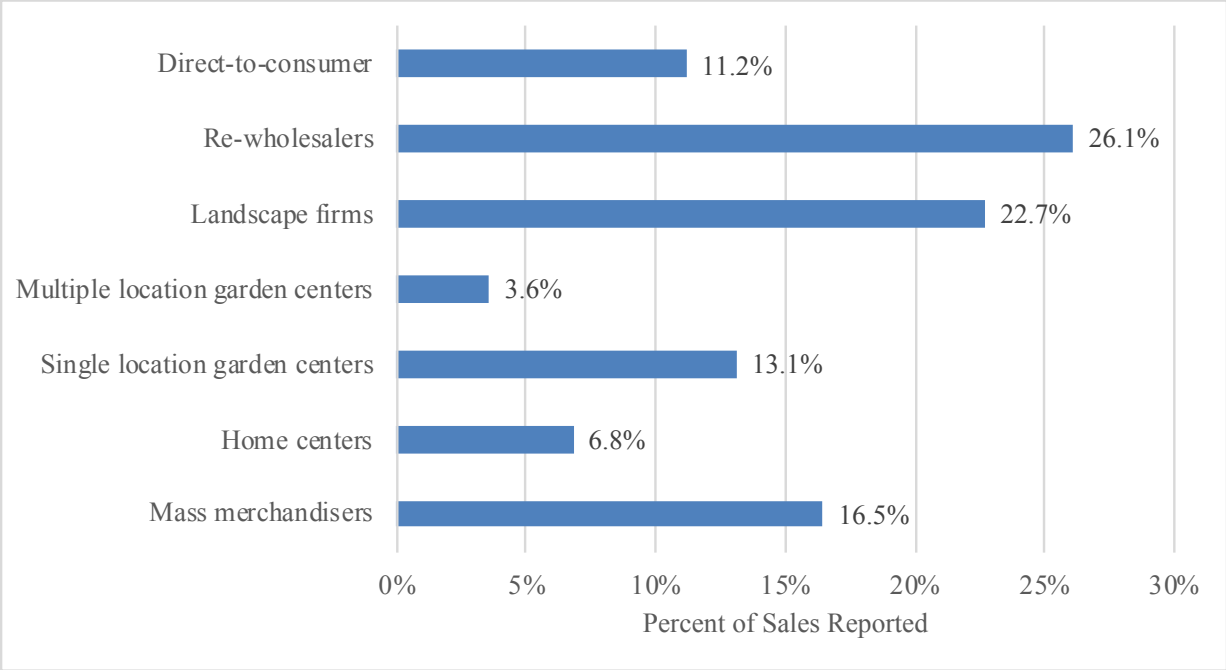
NC	50.2	5.7	0.0	0.9	0.0	0.2	43.1
TN	73.1	4.7	0.0	20.0	1.1	0.4	0.6
VA	44.1	37.7	0.5	7.2	0.3	9.7	0.5
WV	91.1	6.7	0.0	0.0	0.0	0.0	2.2
Great Plains	**96.3**	**1.3**	**0.4**	**1.5**	**0.0**	**0.3**	**0.2**
KS	99.1	0.9	0.0	0.0	0.0	0.0	0.0
ND	48.8	0.0	0.0	50.7	0.5	0.0	0.0
NE	77.7	9.2	5.9	0.0	0.0	4.2	3.0
SD	97.6	0.6	0.0	1.4	0.0	0.0	0.4
Midwest	**73.8**	**9.7**	**0.2**	**4.2**	**0.1**	**2.1**	**9.8**
IA	86.3	10.3	1.0	0.4	0.0	0.2	1.7
IL	80.6	14.6	0.4	2.3	0.4	0.7	1.0
IN	52.5	41.2	0.2	0.0	0.8	5.3	0.0
MI	88.1	2.6	0.1	7.3	0.1	0.1	1.7
MN	31.1	7.4	0.0	0.5	0.0	0.7	60.3
MO	85.4	10.7	1.7	0.0	1.1	0.8	0.2
OH	58.5	10.9	0.4	0.3	0.0	7.1	22.8
WI	67.4	20.3	0.0	5.0	0.0	5.4	1.9
Mountain	**68.3**	**15.6**	**0.6**	**13.8**	**1.4**	**0.0**	**0.3**
AZ	62.9	0.0	0.0	37.0	0.0	0.0	0.1
CO	68.4	27.4	1.4	0.0	2.5	0.1	0.1
ID	34.3	56.8	0.0	0.0	6.9	0.0	2.1
MT	97.6	1.0	0.0	1.3	0.0	0.0	0.0
NV	90.0	0.0	0.0	10.0	0.0	0.0	0.0
UT	90.1	8.4	1.0	0.4	0.0	0.0	0.0
WY	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Northeast	**41.1**	**13.9**	**0.8**	**14.4**	**0.5**	**1.8**	**27.4**
CT	97.3	0.0	0.0	0.4	0.0	0.0	2.3
DE	36.5	0.0	0.1	58.8	0.0	0.0	4.6
MA	87.3	12.7	0.0	0.0	0.0	0.0	0.0
MD	59.4	30.3	0.0	0.0	0.0	0.0	10.3
ME	61.3	16.6	0.0	18.4	0.0	0.0	3.7
NH	82.7	0.0	0.1	0.0	0.8	0.0	16.4
NJ	58.7	32.6	0.0	0.2	0.0	7.7	0.8
NY	76.4	8.7	2.9	2.4	1.7	2.1	5.8
PA	15.1	6.8	0.4	26.7	0.2	0.3	50.5
RI	17.9	75.2	0.0	0.0	0.0	2.6	4.3

VT	56.6	43.4	0.0	0.0	0.0	0.0	0.0
Pacific	**65.3**	**2.5**	**0.6**	**9.4**	**1.8**	**1.7**	**18.8**
AK	87.5	0.0	0.0	0.0	0.0	0.0	12.5
CA	61.7	0.2	0.0	12.5	0.0	1.6	24.0
HI	96.6	0.0	0.0	0.0	2.0	0.0	1.3
OR	69.2	5.5	1.2	4.6	5.3	2.2	12.0
WA	70.9	9.3	3.4	7.3	0.0	0.0	9.0
Southcentral	**90.2**	**6.9**	**0.2**	**0.4**	**0.5**	**0.9**	**0.9**
AR	100.0	0.0	0.0	0.0	0.0	0.0	0.0
LA	97.8	0.1	0.4	0.0	0.0	0.0	1.7
NM	91.0	3.6	0.6	0.1	3.6	0.0	1.0
OK	89.8	6.8	0.0	0.6	0.0	2.8	0.0
TX	86.5	10.8	0.1	0.6	0.1	1.4	0.6
Southeast	**78.8**	**6.9**	**0.3**	**1.4**	**0.1**	**1.0**	**11.5**
AL	49.4	45.8	0.0	3.6	0.0	1.1	0.0
FL	76.6	4.2	0.4	1.4	0.2	0.4	16.8
GA	89.9	6.7	0.0	1.2	0.0	2.2	0.0
MS	100.0	0.0	0.0	0.0	0.0	0.0	0.0
SC	47.9	48.2	0.2	0.9	0.0	2.5	0.4
Grand Total	**69.1**	**8.2**	**0.4**	**6.5**	**0.7**	**1.5**	**13.5**

Market Channels

Respondents were asked to specify the percentage of total sales to different wholesale market outlets, including mass merchandisers, home centers, single location garden centers, multiple location garden centers, landscape firms, re-wholesalers, and others. The most popular outlet, as a share of total wholesale sales, was re-wholesaler firms representing 26 percent of sales nationally, followed by landscape firms (23%) and mass merchandisers (17%), single location garden centers (13%), direct-to-consumer (11%), home centers (7%), and multiple location garden centers (4%), as shown in Figure 7. The share of wholesale sales to mass merchandisers increased by 8 percent from 2013 and the share to re-wholesalers increased by 6 percent, while the share to single location garden centers decreased by 4 percent, and the share to multiple location garden centers remained about the same.

Figure 7. Distribution of wholesale market channel sales of Green industry firms in the U.S. in 2018



Results for market channel sales for individual states and regions are shown in Table 10. Re-wholesalers' market sales as a share of total sales were in excess of 50 percent for Arizona (57%), Idaho (58%), Delaware (100%), New Jersey (51%), and South Carolina (53%). Sales to landscape firms were highest in Indiana (81%), Colorado (77%), Nebraska (70%), Vermont (69%), Maryland (65%), Illinois (59%), Missouri (57%), Wyoming (55%), and Alabama (54%). Sales to mass merchandisers were highest in New York (68%), Hawaii (65%), Michigan (58%), and Montana (56%). Sales to single location garden centers were highest in Nevada (100%), Kansas (91%), Arkansas (70%), Massachusetts (61%), Utah (57%), and Minnesota (53%).

Table 10. Distribution of wholesale market channel sales by Green industry firms in U.S. states and regions in 2018.

Region, State	Mass merchandisers	Home centers	Single location garden centers	Multiple location garden centers	Landscape firms	Re-wholesalers	Direct-to-consumer
			Percent of Wholesale Sales				
Appalachian	**8.2**	**1.4**	**12.7**	**1.9**	**24.2**	**35.4**	**16.1**
KY	15.9	1.9	13.1	1.4	32.8	20.7	14.2

NC	0.9	0.7	15.1	1.4	22.0	40.6	19.3
TN	43.5	6.2	7.8	6.2	1.9	26.1	8.2
VA	0.0	0.6	9.9	1.7	35.7	39.4	12.7
WV	14.1	0.0	12.9	0.0	29.4	21.8	21.7
Great Plains	**0.0**	**2.7**	**45.2**	**2.2**	**34.3**	**3.1**	**12.6**
KS	0.0	0.0	91.1	8.9	0.0	0.0	0.0
ND	0.0	0.0	21.1	0.0	0.0	21.0	57.9
NE	0.0	0.0	30.1	0.0	69.8	0.0	0.1
SD	0.0	20.8	42.3	0.0	6.8	0.0	30.2
Midwest	**34.3**	**14.8**	**13.2**	**1.8**	**17.6**	**11.1**	**7.2**
IA	25.1	2.9	13.4	23.2	14.8	17.6	3.0
IL	0.0	0.0	6.1	0.0	58.5	16.5	18.8
IN	0.6	0.0	5.7	0.0	80.7	6.1	6.9
MI	58.2	24.5	1.6	0.6	0.6	14.2	0.3
MN	35.1	0.0	53.3	0.0	8.0	1.5	2.1
MO	5.1	0.1	4.7	0.1	57.4	0.1	32.6
OH	0.0	0.4	32.1	0.0	36.7	10.2	20.6
WI	0.4	23.7	11.2	4.0	28.6	7.4	24.7
Mountain	**4.1**	**0.2**	**17.7**	**7.6**	**30.8**	**36.4**	**3.1**
AZ	0.0	0.0	8.8	4.8	29.8	56.6	0.0
CO	0.0	0.0	5.1	1.4	77.4	12.7	3.4
ID	0.0	0.0	10.1	3.6	21.2	57.7	7.4
MT	55.6	13.4	13.5	6.7	0.7	0.3	9.7
NV	0.0	0.0	100.0	0.0	0.0	0.0	0.0
UT	16.2	0.0	56.8	24.3	1.1	0.0	1.6
WY	0.0	0.0	4.6	0.0	55.4	9.2	30.8
Northeast	**13.9**	**1.7**	**22.3**	**5.7**	**18.1**	**35.1**	**3.2**
CT	0.0	0.0	20.0	80.0	0.0	0.0	0.0
DE	0.0	0.0	0.0	0.0	0.0	99.6	0.4
MA	5.0	0.0	60.8	0.0	17.3	16.0	0.9
MD	0.0	0.0	5.4	6.2	64.6	23.5	0.2
ME	0.0	0.0	34.7	3.5	23.0	28.0	10.7
NH	0.0	0.0	0.0	0.0	0.0	45.9	54.1
NJ	0.4	7.2	15.3	0.6	24.1	50.7	1.8
NY	67.6	0.2	6.4	0.0	6.7	12.2	6.9
PA	0.0	0.1	36.9	10.6	10.1	39.7	2.5
RI	0.0	0.0	18.8	18.8	15.3	46.9	0.3

VT	2.2	0.0	16.7	3.3	69.0	3.3	5.3
Pacific	**16.8**	**3.8**	**10.2**	**5.4**	**16.3**	**17.5**	**30.1**
AK	0.0	50.0	0.0	0.0	0.0	0.0	50.0
CA	15.4	4.4	5.7	5.1	18.7	11.1	39.7
HI	64.6	4.3	4.4	9.2	1.3	7.6	8.6
OR	9.5	1.1	26.3	8.3	7.0	44.6	3.2
WA	32.8	4.6	12.1	1.7	19.6	12.0	17.2
Southcentral	**3.1**	**0.2**	**6.4**	**1.1**	**41.6**	**37.9**	**9.7**
AR	0.0	0.0	70.0	0.0	30.0	0.0	0.0
LA	4.4	0.0	2.3	0.1	45.6	47.1	0.6
NM	0.0	0.0	24.5	0.0	3.0	3.0	69.4
OK	0.0	0.0	0.1	0.0	44.8	7.1	48.0
TX	1.2	0.7	11.6	3.2	39.1	27.7	16.5
Southeast	**1.0**	**6.7**	**9.3**	**3.4**	**31.4**	**42.0**	**6.1**
AL	0.0	0.0	7.2	1.7	53.9	33.0	4.1
FL	1.1	9.6	8.5	2.8	26.2	47.4	4.5
GA	0.9	0.7	11.5	5.4	43.0	29.3	9.1
MS	0.0	10.7	24.7	6.6	37.9	0.0	20.1
SC	1.6	0.0	4.3	1.0	23.6	52.6	16.8
Grand Total	**16.5**	**6.8**	**13.1**	**3.6**	**22.7**	**26.1**	**11.2**

Irrigation Water Sources and Application Methods Used

The use of water resources for agricultural irrigation and horticultural production is becoming an increasingly important issue (Guo et al. 2019; White et al. 2019; Ingram et al. 2018; Ingram et al. 2017; Ingram et al. 2015). Respondents were asked to indicate the percentage of water used for irrigation that was obtained from the following sources: natural surface, recaptured sources, city (municipal) water supplies, and groundwater wells. Overall, 44 percent of respondents indicated that groundwater wells were a source of water for their irrigation, followed by city water supplies (21%), natural surface water (18%), recaptured sources (6%), and reclaimed water (2%), as shown in Figure 8. Note that respondents were allowed to indicate multiple sources. Among grower firms, a higher share of firms reported using groundwater wells (56%) and natural surface water (24%), while a slightly lower share used city water (22%). On the other hand, a higher share of plant dealer firms reported using wells (37%) and city water (33%).

The survey data on water sources were weighted by annual sales level to estimate the distribution of total water volume used by the source, as shown in Figure 9. Groundwater wells represented 54 percent of the total water used, followed by city water (25%), natural surface water (17%), recaptured (3%), and reclaimed (1%). Again, grower firms had a higher reliance on wells (56%) and city water (21%), which were also the two primary sources used by plant dealer firms at 47% and 39%, respectively.

Survey respondents were also asked about irrigation water application methods used, including overhead sprinklers, drip, sub-irrigation (ebb/flood), hand watering, and other methods. The majority (50%) of respondents reported using overhead sprinkler irrigation, followed by drip irrigation (30%), sub-irrigation (4%), and other unspecified methods (19%), as shown in Figure 10. Among Internet survey respondents, 13 percent of firms also indicated using hand watering. Note that respondents were allowed to choose more than one water application method. Grower firms tended to use overhead (62%) and drip irrigation (40%) more than plant dealer firms (42% and 21%, respectively). The percentage of firms using water-conserving drip irrigation (4%) remained about the same as in the previous survey in 2013.

In terms of volume of water used, based on sales-weighted data, overhead irrigation represented nearly half (47%) of total use, followed by drip irrigation (20%), hand watering (13%), sub-irrigation (2%), and other methods (18%), as shown in Figure 11.

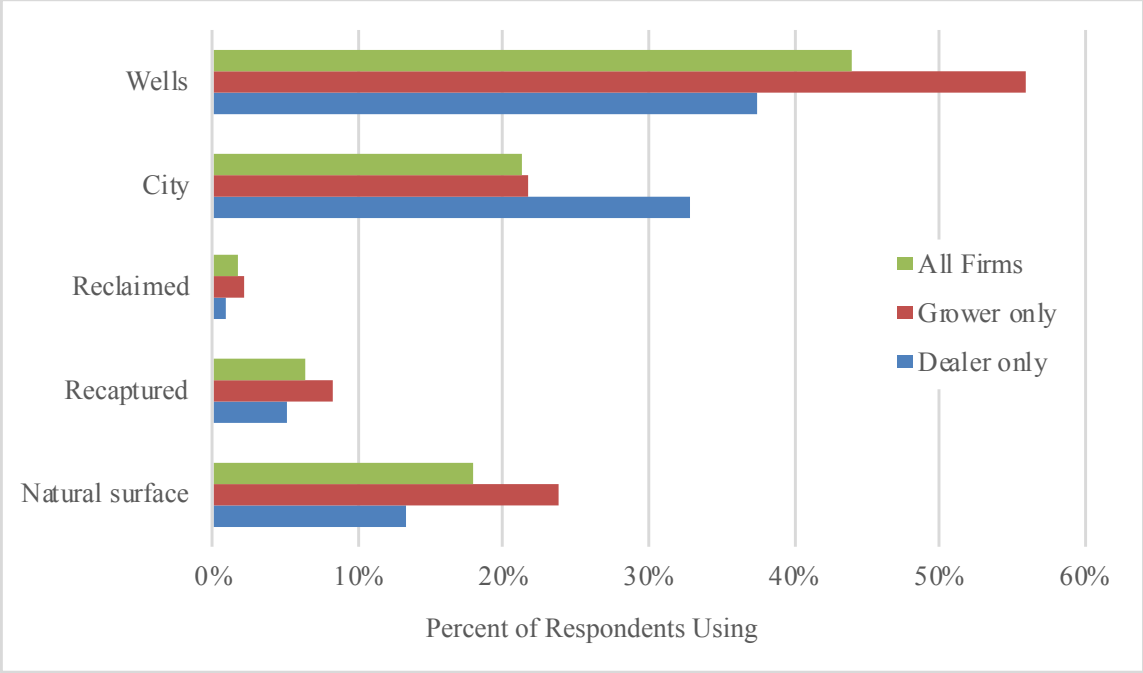
State and region level results on the percentage of respondents using different water sources and application methods are shown in

Table 11. Nineteen states had 50 percent or more of participating firms using wells (AL, FL, MD, ME, MN, MS, MT, NC, ND, NH, NJ, NM, NV, OR, PA, TX, VA, WA, and WI), while several states had less than 30 percent of respondents using wells (CO, DE, HI, IN, KS, KY, LA, MI, OH, RI, SD, TN, UT, and WV). States in which at least half of firms used city water for irrigation were AR, AZ, HI, KS, MS, SD, UT, and WY. States with the highest percentage of firms using natural surface water were AK (67%) and MS (100%). States in which 20 percent or more of firms used either recaptured or reclaimed water were SD and HI. States with over 70 percent of firms using overhead water irrigation were AK, AL, AR, HI, MS, MT, NC, and ND. States with 40 percent or more of firms using drip irrigation were AL, AZ, CA, IA, KY, MS, MT, NJ, NM, NV, NY, TX, UT, and VT. States that reported above 10 percent of firms using the sub-irrigation method included AK, AZ, ID, MA, MD, MO, ND, NH, NM, PA, RI, and UT (

Table 11).

Survey respondents were also asked about the use of "smart" irrigation, i.e., systems using soil moisture or weather sensors to control irrigation and apply water only when needed by plants. Overall, about 11 percent of respondents reported using this technology. States reporting above-average use of smart irrigation systems were AL, FL, IA, IN, KY, MA, MD, ME, MI, MN, MT, NC, NV, OH, RI, TN, and UT (Table 11).

Figure 8. Irrigation water sources used by U.S. Green industry firms in 2018



Trends over time in water use for irrigation are also important for measuring efforts toward resource conservation in the industry. Approximately 69 percent of all firms reported that their water use per acre had remained the same over the past five years, while 14 percent responded that it has increased, and 17 percent said it has decreased (Figure 12). Among grower firms, a slightly larger share of respondents said that water use intensity has decreased (18%), and 17 percent of dealer firms reported a decrease in water use. A higher percentage of firms, including growers and dealers, had water use remain the same at approximately 70 percent. States in which a third or more of firms with decreased water use were AR, DE, KS, MA, SD, and WY, while states in which a third or more firms increased water use were AR, ID, KY, MO, MS, OK, and SD (

Table 11).

Figure 9. Distribution of irrigation water volume used by source by U.S. Green industry firms in 2018

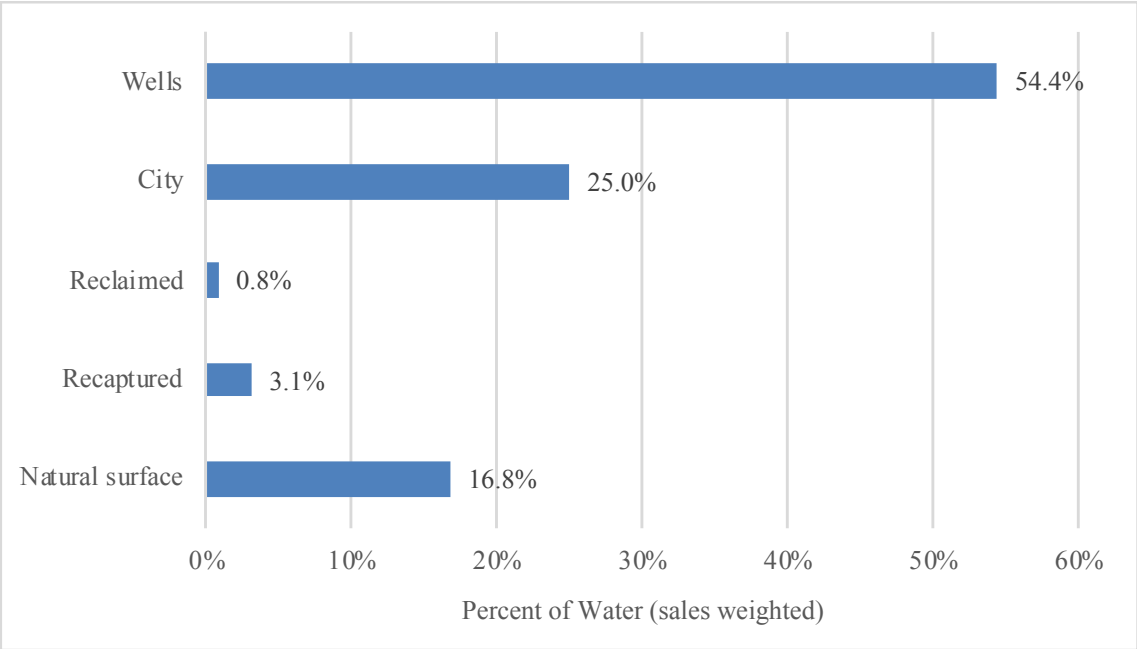


Figure 10. Irrigation application methods used by U.S. Green industry firms in 2018

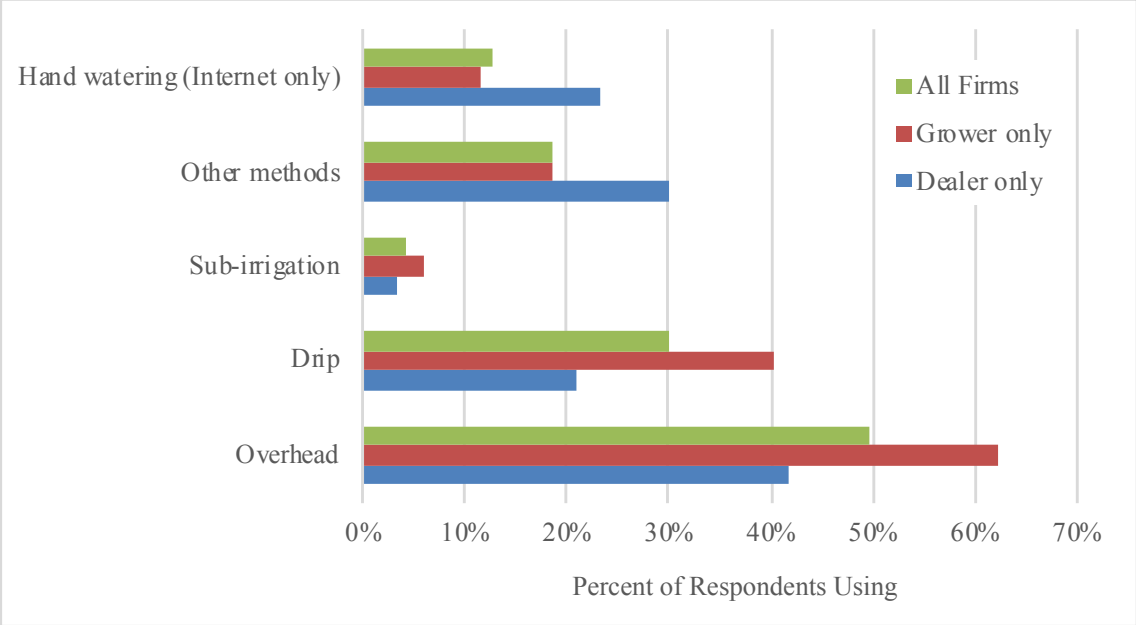


Figure 11. Distribution of irrigation water use by application method for U.S. Green industry firms in 2018

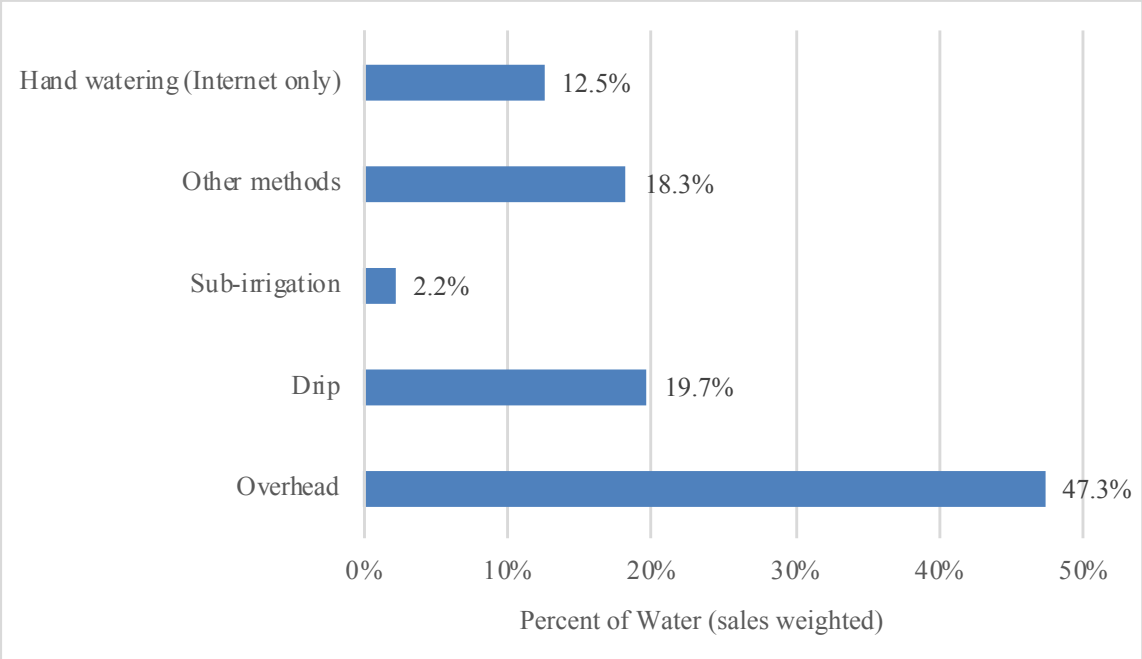


Figure 12. Distribution of change in irrigation water use per acre for U.S. Green industry firms in 2018

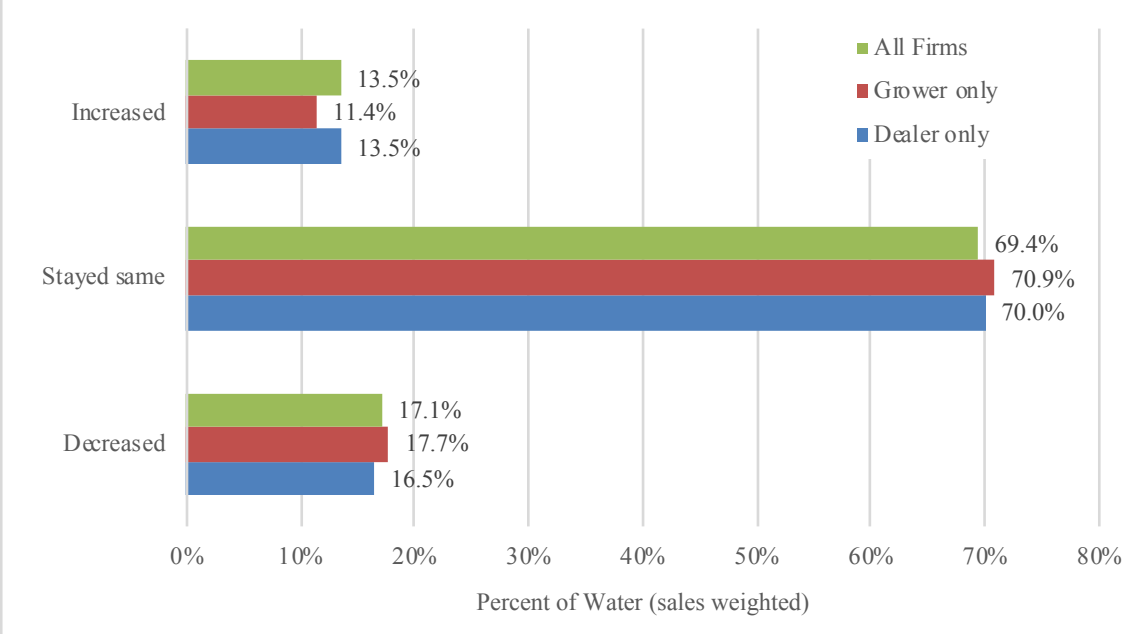


Table 11. Irrigation water sources and application methods used by Green industry firms in U.S. states and regions in 2018

Region, State	Firms Using Irrigation Water Sources					Firms Using Irrigation Methods				Change in Water Use Per Acre			Smart Irrigation Systems
	Natural surface	Recaptured	Reclaimed	City	Wells	Overhead	Drip	Sub-irrigation	Other methods	Decreased	Stayed same	Increased	
	Percent of Firms												
Appalachian	**29**	**4**	**2**	**25**	**33**	**56**	**30**	**3**	**21**	**13**	**69**	**18**	**13**
KY	27	4	0	33	18	58	49	2	11	3	64	33	12
NC	38	5	5	12	57	77	26	6	25	16	69	16	16
TN	19	3	2	31	14	34	19	0	17	17	66	17	15
VA	36	4	0	16	56	64	32	4	28	27	64	9	5
WV	26	5	0	42	26	42	32	0	37	0	93	7	6
Great Plains	**9**	**7**	**2**	**36**	**32**	**48**	**18**	**2**	**23**	**20**	**60**	**20**	**6**
KS	0	0	0	78	11	56	22	0	22	33	50	17	0
ND	20	10	0	30	50	70	10	10	30	10	70	20	10
NE	10	5	5	19	33	38	19	0	14	18	64	18	9
SD	0	25	0	50	25	25	25	0	50	33	33	33	0
Midwest	**16**	**6**	**1**	**17**	**34**	**35**	**23**	**5**	**16**	**19**	**69**	**13**	**11**
IA	12	4	0	46	31	58	50	8	15	19	62	19	19
IL	19	3	6	23	45	48	29	0	19	14	73	14	0
IN	13	6	3	20	19	26	19	4	16	18	71	11	15
MI	16	7	1	10	27	25	16	7	10	23	62	15	13
MN	20	0	0	10	60	45	25	5	20	29	71	0	13
MO	5	14	0	32	45	45	36	14	18	0	64	36	11
OH	16	6	0	18	20	29	22	5	13	19	69	11	15
WI	22	9	1	7	63	49	22	1	27	19	75	6	4
Mountain	**19**	**4**	**0**	**29**	**26**	**43**	**30**	**7**	**17**	**18**	**71**	**11**	**14**
AZ	40	0	0	60	40	60	40	20	40	20	80	0	0
CO	16	5	0	30	5	27	20	7	11	28	67	6	11
ID	31	0	0	13	31	50	38	13	6	0	67	33	11
MT	25	8	0	8	75	75	42	0	17	0	90	10	27
												10	
NV	0	0	0	0	50	50	50	0	0	0	0	0	100
UT	13	13	0	50	25	63	50	13	25	29	71	0	13
WY	0	0	0	57	43	29	14	0	57	40	60	0	0
Northeast	**23**	**6**	**1**	**18**	**54**	**57**	**33**	**6**	**24**	**16**	**72**	**12**	**11**
CT	0	0	0	20	40	60	0	0	40	0	100	0	0

DE	27	0	0	27	27	33	7	0	33	43	43	14	11
MA	9	0	0	9	36	36	18	18	0	33	50	17	17
MD	18	6	0	6	71	65	29	18	29	27	67	7	27
ME	28	10	0	3	66	55	17	0	28	13	58	29	13
NH	20	10	0	10	60	60	20	10	30	11	78	11	11
NJ	8	3	0	13	74	61	42	3	18	27	64	9	10
NY	29	7	2	27	48	55	43	4	24	11	78	12	13
PA	23	7	2	12	57	64	35	10	27	18	76	6	8
RI	14	14	0	29	29	43	0	14	14	20	60	20	20
VT	42	0	0	25	42	67	42	0	17	0	83	17	0
Pacific	**15**	**6**	**2**	**34**	**48**	**62**	**47**	**3**	**23**	**19**	**70**	**12**	**10**
AK	67	0	0	0	33	100	33	33	0	0	100	0	0
CA	9	4	2	47	49	64	57	2	30	24	64	12	11
HI	8	23	8	85	0	85	31	0	0	9	91	0	0
OR	28	10	1	15	54	55	38	1	17	11	72	16	9
WA	8	0	0	8	56	60	32	8	12	11	84	5	10
Southcentral	**11**	**9**	**2**	**32**	**40**	**41**	**28**	**3**	**22**	**17**	**66**	**17**	**9**
AR	0	0	0	67	33	100	0	0	0	33	33	33	0
LA	9	5	5	19	19	30	11	4	9	17	72	11	11
NM	23	8	0	23	77	23	46	23	23	15	69	15	8
OK	15	10	0	25	30	40	20	0	15	15	46	38	0
TX	10	11	1	43	51	50	41	1	34	16	69	15	11
Southeast	**16**	**7**	**3**	**14**	**53**	**53**	**28**	**4**	**14**	**17**	**70**	**13**	**13**
AL	16	16	0	26	53	74	47	0	0	6	76	18	20
FL	16	8	3	12	57	54	29	4	13	20	68	12	15
GA	14	5	0	16	42	41	23	1	18	9	72	19	6
MS	100	0	0	50	50	100	50	0	50	0	50	50	0
SC	19	3	3	35	43	57	24	5	22	14	76	10	4
Grand Total	**18**	**6**	**2**	**21**	**44**	**50**	**30**	**4**	**19**	**17**	**69**	**13**	**11**

Integrated Pest Management Practices

Green industry firms routinely use Integrated Pest Management (IPM) as part of their Best Management Practices that seek to minimize the application of chemicals, decrease disease/pests, and reduce impacts on beneficial insects or non-pest organisms. Respondents were asked to select from a list of 22 possible IPM practices that they routinely follow. The percentages of Green industry firms who reported using these practices are shown in

Figure 13. The most common IPM practices used in 2018 were the removal of pest-infested plants (59%), cultivation/hand weeding (50%), spot treatment with pesticides (44%), inspection of incoming stock (40%), elevating or spacing plants for air circulation (38%), and alternating pesticides to avoid chemical resistance (37%). A second tier of practices followed by at least 20 percent of firms was ventilating greenhouses (30%), managing irrigation to reduce pests (28%), using mulches to suppress weeds (25%), adjust pesticides to protect beneficial insects (22%), and disinfecting benches and ground covers (22%). A third group of practices used by at least 10 percent of firms were adjusting fertilization rates (19%), identifying beneficial insects (19%), using pest-resistant varieties (17%), monitoring pest populations with a tarp or sticky boards (17%), using beneficial insects (15%), using bio-pesticides/lower toxicity (12%), and keeping pest activity records (10%). Finally, the least commonly used IPM practices were screening and using barriers to exclude pests (8%), soil solarization and sterilization (5%), treating retention pond water (2%), and using sanitized water foot baths (2%). All IPM practices except using sanitized water foot baths, soil solarization/sterilization, monitoring pest populations with a tarp or sticky board, inspecting incoming stock, and treating retention pond water were used more frequently by growers compared to plant dealers or all firms (

Figure 13).

Table 12 presents the detailed results for the percentage of respondents using various IPM practices by region and state. Differences in the prevalence of these practices across states presumably reflect variations in pest pressures, agroclimatic factors, pesticide regulations, crop mix, and management knowledge and experience. States where 80 percent or more of firms reported removing infested plants, which was the top IPM practice reported by all firms, included Alaska, Arizona, California, Kansas, Mississippi, Montana, New Jersey, North Dakota, Texas, Utah, Vermont, and Virginia. States where at

least 70 percent of firms reported using cultivation and hand weeding, the second-highest ranked practice overall, included Alaska, Arizona, California, Kansas, North Dakota, and South Dakota. Finally, states where at least 70 percent of firms reported using spot treatment with pesticides, the third-highest ranked IPM practice overall, included Arkansas, Kansas, Maryland, North Dakota, Pennsylvania, South Dakota, and Utah.

Figure 13. Integrated pest management (IPM) practices used by U.S. Green industry growers, dealers and all firms in 2018

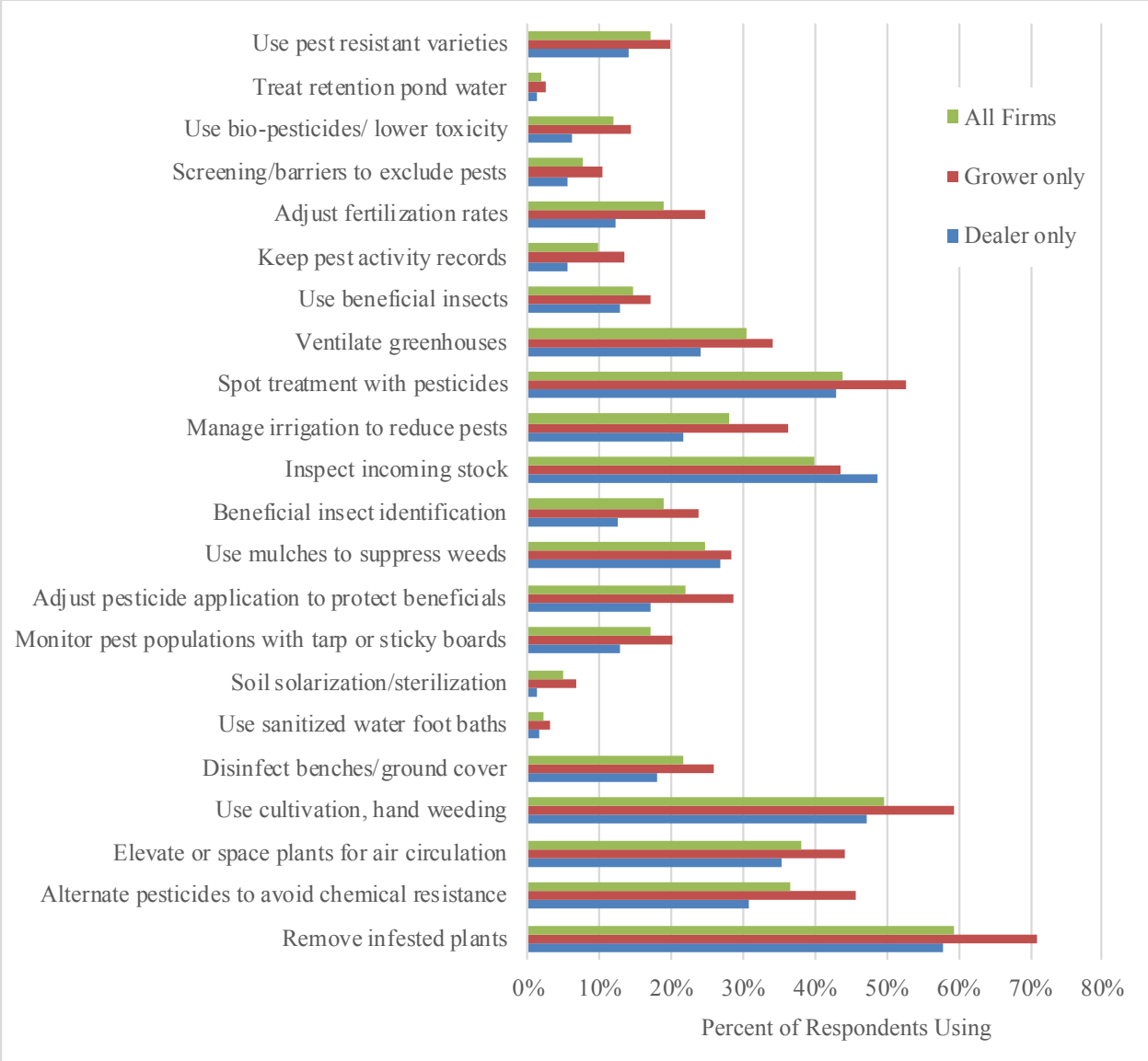


Table 12. Integrated pest management (IPM) practices used by U.S. Green industry firms in 2018, by state and region

Region, State	Remove infested plants	Alternate pesticides to avoid chemical resistance	Elevate or space plants for air circulation	Use cultivation, hand weeding	Disinfect benches/ground cover	Use sanitized water foot baths	Soil solarization/sterilization	Monitor pest populations with tarp or sticky boards	Adjust pesticide application to protect beneficials	Use mulches to suppress weeds	Beneficial insect identification
						Percent of Firms Using					
Appalachian	**61**	**45**	**40**	**53**	**27**	**4**	**5**	**21**	**24**	**17**	**22**
KY	64	56	47	44	31	2	0	22	20	18	16
NC	71	58	52	68	37	8	6	34	35	18	26
TN	38	20	19	34	14	0	6	11	13	14	17
VA	80	56	56	64	32	4	0	16	24	12	20
WV	74	47	32	68	16	5	11	11	37	32	37
Great Plains	**70**	**43**	**55**	**55**	**34**	**0**	**7**	**36**	**14**	**32**	**11**
KS	89	56	56	78	56	0	0	44	22	33	11
ND	100	40	90	70	30	0	10	40	30	50	0
NE	52	33	38	33	33	0	5	29	5	24	14
SD	50	75	50	75	0	0	25	50	0	25	25
Midwest	**48**	**26**	**31**	**38**	**15**	**1**	**4**	**15**	**16**	**26**	**15**
IA	77	50	46	42	31	4	4	19	23	50	23
IL	68	52	45	55	23	0	10	19	39	29	13
IN	29	17	21	26	11	0	3	7	10	9	13
MI	32	17	22	24	12	1	4	13	11	16	13
MN	75	30	35	55	5	0	10	30	20	35	15
MO	68	32	50	59	27	5	0	32	32	45	32
OH	42	23	23	30	14	2	1	8	11	22	11
WI	73	34	48	69	13	0	7	19	21	49	19
Mountain	**49**	**32**	**26**	**38**	**21**	**4**	**2**	**18**	**16**	**21**	**18**
AZ	100	60	20	80	20	20	20	40	20	0	20
CO	30	18	14	23	11	2	2	11	11	14	11
ID	50	50	25	50	19	0	0	25	31	31	19
MT	83	50	42	58	50	17	0	50	25	25	42
NV	50	0	50	50	50	0	0	0	0	50	50
UT	88	50	75	63	25	0	0	0	0	50	13
WY	29	14	14	14	29	0	0	0	14	14	14
Northeast	**72**	**44**	**47**	**54**	**28**	**1**	**6**	**24**	**23**	**32**	**22**
CT	60	40	40	40	40	0	20	0	20	20	0
DE	53	33	33	27	20	0	7	0	7	27	27
MA	45	45	36	36	45	0	9	36	27	18	18

MD	71	47	53	65	29	0	0	29	47	29	35
ME	76	10	45	69	21	0	3	31	14	38	31
NH	70	20	30	60	40	0	30	20	20	40	10
NJ	82	55	45	58	21	3	3	21	37	34	21
NY	70	40	56	62	31	3	6	29	19	37	24
PA	77	65	46	41	30	1	5	23	28	20	17
RI	57	14	0	43	0	0	0	0	0	29	0
VT	83	25	58	67	33	0	0	17	8	67	17
Pacific	**74**	**44**	**42**	**65**	**23**	**4**	**8**	**25**	**30**	**30**	**20**
AK	100	33	100	100	33	0	0	67	33	33	100
CA	84	47	46	77	21	5	11	31	31	32	22
HI	69	54	38	54	38	0	8	8	23	15	0
OR	62	37	33	51	22	2	5	18	30	34	20
WA	60	48	44	44	28	4	0	20	24	12	16
Southcentral	**65**	**45**	**39**	**49**	**21**	**2**	**4**	**16**	**25**	**21**	**21**
AR	67	100	33	33	33	0	0	33	33	33	67
LA	37	32	23	26	12	0	0	4	16	9	11
NM	77	54	23	62	8	0	0	31	31	23	23
OK	65	45	40	40	25	10	0	20	30	15	15
TX	84	50	53	66	29	3	9	21	30	30	28
Southeast	**52**	**32**	**36**	**49**	**19**	**2**	**4**	**9**	**22**	**22**	**18**
AL	63	58	37	58	26	0	0	0	47	16	16
FL	52	30	35	50	19	2	5	8	21	23	19
GA	50	34	34	42	19	2	1	9	18	15	14
MS	100	100	100	50	0	0	50	50	50	50	50
SC	54	27	46	51	22	5	0	22	22	27	24
Grand Total	**59**	**37**	**38**	**50**	**21**	**2**	**5**	**17**	**22**	**25**	**19**

Table 12 (continued). Integrated pest management (IPM) practices used by U.S. Green industry firms in 2018, by state and region

Region, State	Inspect incoming stock	Manage irrigation to reduce pests	Spot treatment with pesticides	Ventilate greenhouses	Use beneficial insects	Keep pest activity records	Adjust fertilization rates	Screening/barriers to exclude pests	Use bio-pesticides/ lower toxicity	Treat retention pond water	Use pest resistant varieties
	Percent of Firms Using										
Appalachian	**44**	**24**	**51**	**39**	**13**	**11**	**19**	**6**	**12**	**1**	**16**
KY	51	22	51	51	2	9	22	2	11	0	20
NC	54	43	68	46	14	18	26	9	15	5	17
TN	30	14	33	19	16	6	13	5	9	0	11

VA	44	16	52	36	12	8	8	0	16	0	24
WV	42	11	53	58	32	16	21	11	11	0	5
Great Plains	**50**	**30**	**59**	**43**	**11**	**14**	**20**	**7**	**11**	**0**	**11**
KS	67	22	78	44	0	22	11	11	22	0	0
ND	70	30	80	70	0	30	20	10	10	0	20
NE	33	24	38	24	19	0	24	5	5	0	10
SD	50	75	75	75	25	25	25	0	25	0	25
Midwest	**36**	**17**	**34**	**23**	**14**	**7**	**14**	**5**	**8**	**2**	**16**
IA	62	23	62	31	15	4	23	0	15	0	15
IL	52	35	58	35	13	16	19	3	3	0	29
IN	24	14	20	19	6	3	7	1	7	1	11
MI	26	13	19	17	16	6	12	5	6	1	10
MN	45	25	60	25	15	10	20	5	10	0	30
MO	55	18	45	55	36	14	9	9	23	9	18
OH	25	11	31	17	6	8	8	5	4	1	12
WI	52	18	49	30	19	6	25	9	13	3	24
Mountain	**38**	**33**	**43**	**30**	**15**	**12**	**17**	**12**	**9**	**3**	**15**
AZ	60	80	60	40	0	40	60	20	20	20	40
CO	30	23	30	20	11	7	7	14	11	5	11
ID	56	31	50	19	25	19	13	13	6	0	13
MT	50	50	58	50	33	25	42	8	0	0	25
NV	50	0	0	50	50	0	0	0	0	0	0
UT	38	75	75	50	0	0	13	0	0	0	13
WY	14	0	43	43	0	0	29	14	14	0	14
Northeast	**51**	**32**	**56**	**42**	**16**	**13**	**22**	**8**	**13**	**1**	**23**
CT	60	20	20	40	40	0	20	0	0	0	0
DE	33	13	47	20	20	20	7	7	13	0	27
MA	27	36	36	45	18	18	27	9	27	0	9
MD	59	35	71	59	24	12	29	6	29	0	29
ME	41	14	45	34	21	3	7	7	17	0	24
NH	50	20	40	50	30	10	20	10	10	0	50
NJ	55	34	61	26	11	11	24	8	18	5	21
NY	54	40	48	49	18	12	29	10	10	2	21
PA	56	28	74	42	10	23	21	5	12	1	23
RI	14	14	43	14	0	0	0	29	0	0	0
VT	67	50	67	50	25	0	8	8	8	0	33
Pacific	**44**	**38**	**48**	**36**	**20**	**14**	**21**	**11**	**19**	**1**	**17**
AK	33	33	33	100	100	0	33	0	33	0	0
CA	52	44	52	38	14	16	24	14	19	1	18
HI	38	23	62	8	0	8	23	15	15	8	8
OR	33	32	40	37	30	12	20	9	18	1	21

WA	44	32	48	32	20	8	8	4	16	0	8
Southcentral	**40**	**25**	**46**	**32**	**13**	**8**	**16**	**10**	**14**	**4**	**17**
AR	33	0	100	33	0	0	0	33	0	0	33
LA	18	18	23	18	4	9	9	7	7	0	14
NM	46	31	46	38	31	0	8	8	31	0	0
OK	45	20	55	40	20	10	25	5	15	10	20
TX	55	31	58	40	16	9	20	13	16	6	21
Southeast	**32**	**32**	**39**	**22**	**13**	**7**	**21**	**7**	**11**	**2**	**16**
AL	42	37	68	26	0	21	21	5	5	0	26
FL	31	33	38	19	14	5	22	7	11	2	16
GA	32	27	33	26	7	10	17	5	8	2	14
MS	100	0	50	100	50	50	0	0	0	0	0
SC	38	27	46	35	16	5	22	16	19	0	14
Grand Total	**40**	**28**	**44**	**30**	**15**	**10**	**19**	**8**	**12**	**2**	**17**

Interregional Trade of Plant Products

Information was collected in the survey on sales of plant products by destination state or country. The home state of the firm was listed as the first option for a destination state since this was the dominant practice of firms in all states in the previous surveys. In most cases, the weighted percentage of sales to buyers within the nursery's home state was by far the largest. Interregional trade flows of products are summarized in Figure 14, and trade flows for individual states and regions are summarized in Table 13. Regions with the largest share of product sales to other regions were the Appalachian (65%), Southeast (51%), Pacific (47%), Mountain (37%), Great Plains (35%), and Northeast (32%) regions, while the Southcentral and Midwest regions had a low proportion of sales outside of home regions. Individual states with the largest share of products sold to other regions were Virginia (82%), North Carolina (65%), Arizona (63%), Kansas (61%), Tennessee (60%), Florida (60%), Oregon (55%), and New York (52%). International exports represented less than 1 percent of overall sales, similar to the 2013 survey estimate. States with more than 1 percent share of international sales were Florida (5%), Louisiana (3%), North Dakota (3%), and Oregon (2%). Among foreign trading partner countries for U.S. Green industry products, Canada was the most frequently reported country, followed by the Caribbean Islands, Bermuda, and European Union.

Figure 14. Sales of plant products outside of home region by U.S. Green industry firms in 2018

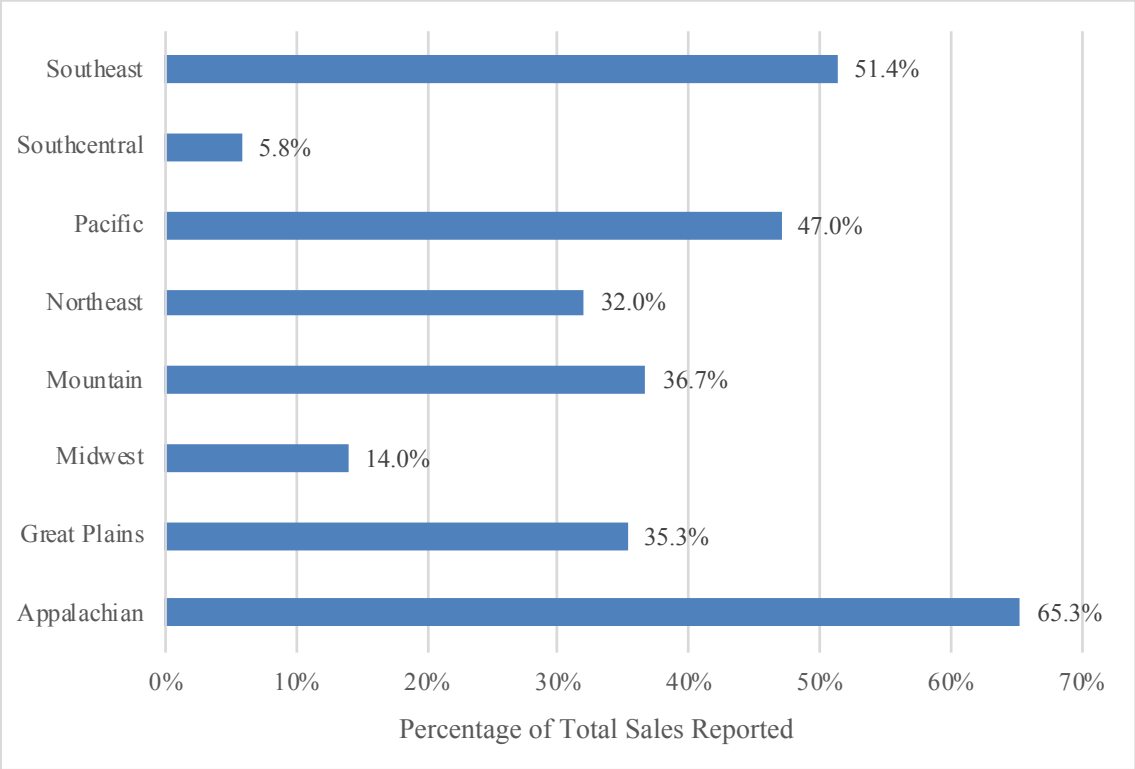


Table 13. Interregional and international sales in 2018 by U.S. Green industry firms, by state and region

Headquarters (Home) Region	Destination Region									Total sales outside home region
	Appalachian	Great Plains	Midwest	Mountain	Northeast	Pacific	Southcentral	Southeast	International	
	Percentage of Total Sales									
Appalachian	**34.7**	**0.0**	**5.8**	**3.7**	**32.4**	**2.7**	**4.3**	**16.5**	**0.0**	**65.3**
KY	69.3	0.0	27.5	0.0	2.2	0.6	0.0	0.4	0.0	30.7
NC	34.8	0.0	1.9	8.5	21.1	5.1	5.8	22.9	0.0	65.2
TN	40.2	0.0	7.7	0.0	12.7	2.3	8.1	28.9	0.0	59.8
VA	18.5	0.0	3.6	0.0	77.5	0.0	0.0	0.4	0.0	81.5
WV	69.0	0.0	27.7	0.0	3.4	0.0	0.0	0.0	0.0	31.0
Great Plains	**0.0**	**64.7**	**27.1**	**2.5**	**0.0**	**0.0**	**5.3**	**0.0**	**0.4**	**35.3**
KS	0.0	39.3	36.4	0.0	0.0	0.0	24.3	0.0	0.0	60.7
ND	0.0	66.3	16.5	14.6	0.0	0.0	0.0	0.0	2.6	33.7
NE	0.0	76.1	23.9	0.0	0.0	0.0	0.0	0.0	0.0	23.9
SD	0.0	65.8	34.2	0.0	0.0	0.0	0.0	0.0	0.0	34.2
Midwest	**1.7**	**2.9**	**86.0**	**0.0**	**4.0**	**0.0**	**0.8**	**4.4**	**0.0**	**14.0**

IA	0.0	10.7	89.3	0.0	0.0	0.0	0.0	0.0	0.0	10.7
IL	0.5	0.0	99.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5
IN	8.3	0.0	90.5	0.0	0.0	0.0	0.0	1.2	0.0	9.5
MI	1.5	0.0	90.7	0.0	1.4	0.0	0.0	6.3	0.0	9.3
MN	0.0	21.2	78.7	0.1	0.0	0.0	0.0	0.0	0.0	21.3
MO	0.0	16.5	62.9	0.0	20.6	0.0	0.0	0.0	0.0	37.1
OH	2.5	0.0	69.1	0.0	18.3	0.0	5.1	5.1	0.0	30.9
WI	0.1	0.0	97.8	0.0	0.8	0.8	0.3	0.1	0.0	2.2
Mountain	**0.0**	**3.2**	**0.1**	**63.3**	**0.1**	**15.2**	**18.2**	**0.0**	**0.0**	**36.7**
AZ	0.0	0.0	0.1	37.3	0.0	29.2	33.3	0.0	0.0	62.7
CO	0.0	5.4	0.0	89.1	0.1	0.1	5.2	0.1	0.0	10.9
ID	0.0	0.0	0.0	88.9	0.0	2.8	8.3	0.0	0.0	11.1
MT	0.0	0.0	0.0	99.2	0.8	0.0	0.0	0.0	0.0	0.8
NV	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
UT	0.0	0.0	0.0	93.2	0.5	6.2	0.0	0.0	0.0	6.8
WY	0.0	48.6	0.0	51.4	0.0	0.0	0.0	0.0	0.0	48.6
Northeast	**6.2**	**0.0**	**5.6**	**3.6**	**68.0**	**4.8**	**5.9**	**5.9**	**0.0**	**32.0**
CT	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
DE	37.8	0.0	0.0	0.0	62.1	0.0	0.0	0.0	0.0	37.9
MA	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
MD	25.4	0.0	0.0	0.0	74.2	0.4	0.0	0.0	0.0	25.8
ME	0.0	4.0	0.0	0.0	96.0	0.0	0.0	0.0	0.0	4.0
NH	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
NJ	0.9	0.0	0.0	0.0	99.1	0.0	0.0	0.0	0.0	0.9
NY	0.1	0.1	0.2	30.4	48.4	0.2	10.3	10.3	0.0	51.6
PA	6.6	0.0	10.3	0.0	55.2	9.3	9.3	9.3	0.0	44.8
RI	0.0	0.0	19.2	0.0	80.8	0.0	0.0	0.0	0.0	19.2
VT	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Pacific	**1.2**	**2.3**	**11.9**	**19.3**	**6.6**	**53.0**	**2.6**	**2.4**	**0.8**	**47.0**
AK	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
CA	1.8	0.0	10.6	25.9	1.6	53.8	3.2	2.7	0.4	46.2
HI	0.0	0.0	0.8	0.8	0.5	65.1	16.3	16.6	0.0	34.9
OR	0.0	6.9	16.4	13.4	16.9	44.7	0.0	0.2	1.6	55.3
WA	3.4	0.0	6.4	3.3	0.0	80.4	3.1	3.2	0.3	19.6
Southcentral	**0.3**	**0.0**	**1.2**	**0.4**	**0.5**	**0.4**	**94.2**	**2.0**	**1.0**	**5.8**
AR	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0
LA	0.8	0.0	3.0	0.0	1.5	0.1	85.9	5.7	3.0	14.1
NM	0.0	0.0	0.0	5.9	0.0	4.6	89.4	0.0	0.0	10.6
OK	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0
TX	0.1	0.1	0.2	0.0	0.0	0.2	99.4	0.0	0.0	0.6
Southeast	**18.4**	**0.2**	**7.7**	**0.4**	**9.0**	**2.8**	**9.9**	**48.6**	**3.0**	**51.4**

AL	24.5	0.0	0.0	0.0	0.0	0.5	11.4	63.6	0.0	36.4
FL	9.4	0.4	12.8	0.6	12.8	4.6	14.3	40.4	4.9	59.6
GA	32.4	0.0	0.1	0.0	3.3	0.0	2.3	61.9	0.0	38.1
MS	0.0	0.0	0.0	0.0	0.0	0.0	46.2	53.8	0.0	46.2
SC	39.1	0.0	0.1	0.0	7.8	0.4	0.0	52.2	0.6	47.8
Grand Total	**7.8**	**1.9**	**32.8**	**6.5**	**17.1**	**10.3**	**10.1**	**12.7**	**0.7**	**0.0**

Marketing Practices

Effective marketing of ornamental plant products is critical for survival and success in the Green industry. Survey results for several common marketing practices are shown in Figure 15. About 58 percent of all Green industry wholesale sales in 2018 were to repeat customers, down from 78 percent in 2013, and for grower firms, it was over 83 percent, down from 90 percent in 2013. Negotiated sales, defined as transactions where price and terms were discussed, represented 25 percent of total sales for all firms. Negotiated sales were a much higher (41%) for growers, but noticeably lower for plant dealers or retailer firms (7%). Brokerage or resale of finished products represented slightly over 3 percent of all Green industry sales, which is approximately 4 percent less than the 2013 survey results. Forward contracting is an important marketing practice that many producers use as a risk management tool. Forward contract sales accounted for 19 percent of the overall sales and 31 percent for grower firms. The most common specific type of buyer for forward contracting was producers, used by 12 percent of wholesaler firms, followed by retail garden centers (6%), mass merchandisers (3%), and cooperatives (1%), while miscellaneous other types of buyers were contracted with by 11 percent, as shown in Figure 16.

Table 14 shows the percentage of total sales under selected marketing practices by region and state. Repeat customer sales represented 80 percent or more of all sales in 13 states (AL, AZ, De, HI, MD, MI, MN, NJ, OK, PA, TX, UT, and VA). Negotiated sales represented at least 40 percent of total sales in 6 states (AZ, LA, MI, MN, OK, and UT). Brokered sales represented 20 percent or more of sales in MD and WV. Forward contract sales accounted for at least 40 percent of sales in 6 states (AZ, DE, MI, OK, SD, and WA).

Figure 15. Customer types and forward contracting practices by U.S. Green industry firms in 2018

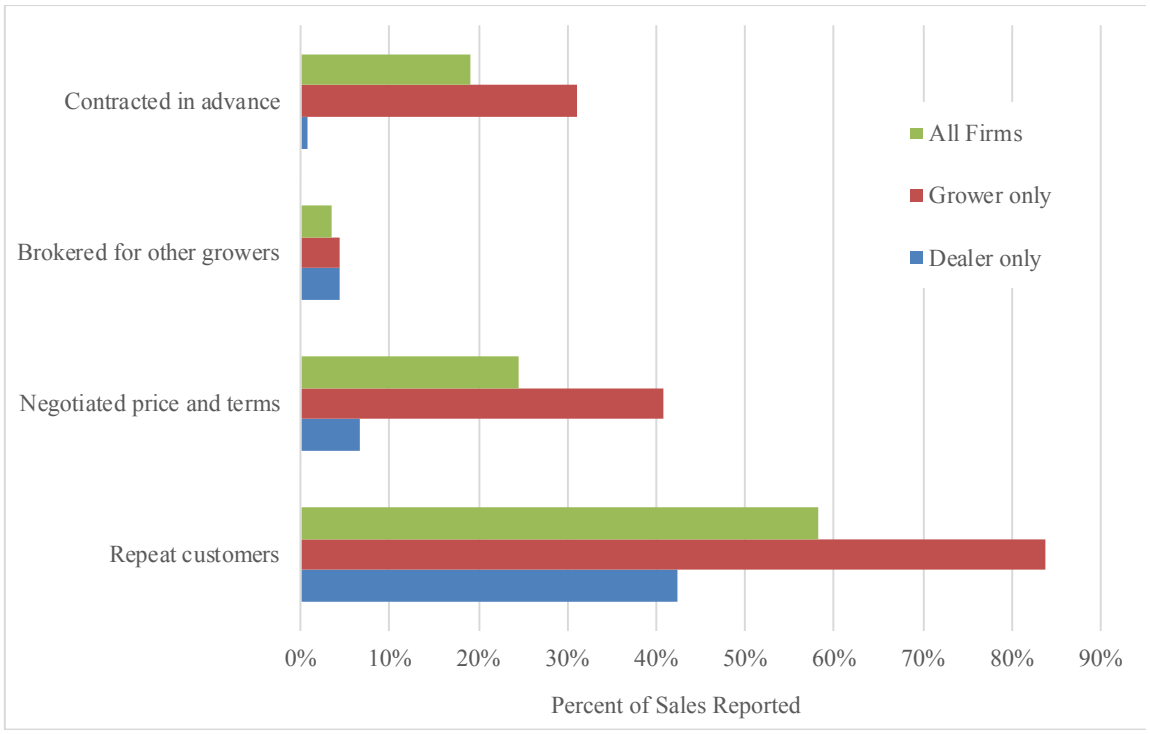


Figure 16. Customer types for forward contracting by U.S. Green industry wholesalers in 2018

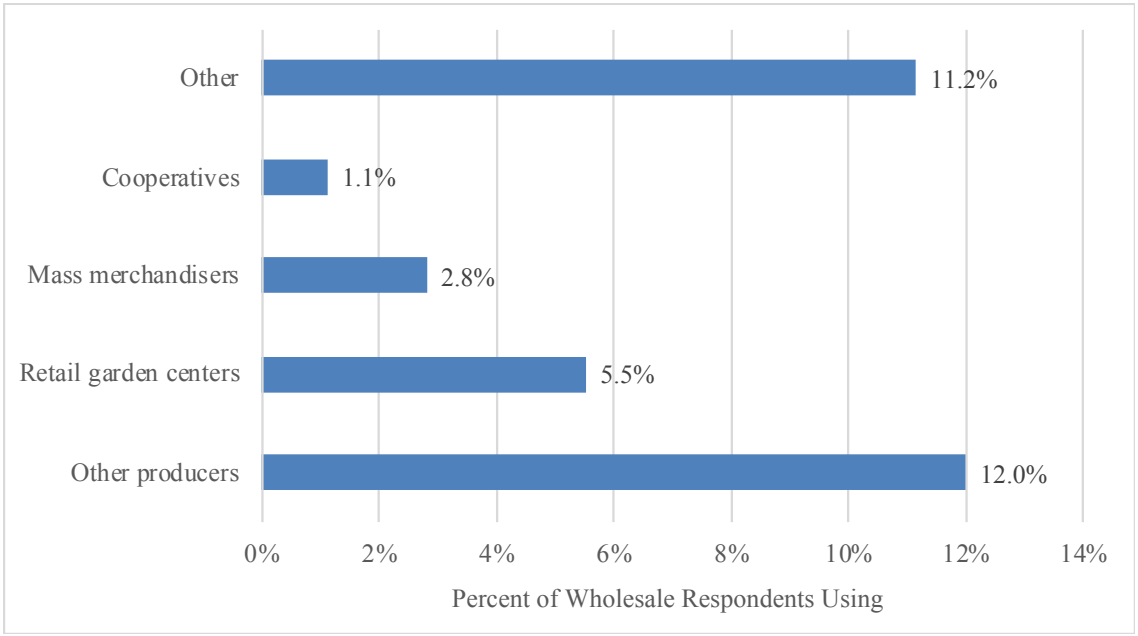


Table 14. Marketing practices used by U.S. Green industry firms in 2018, by state and region

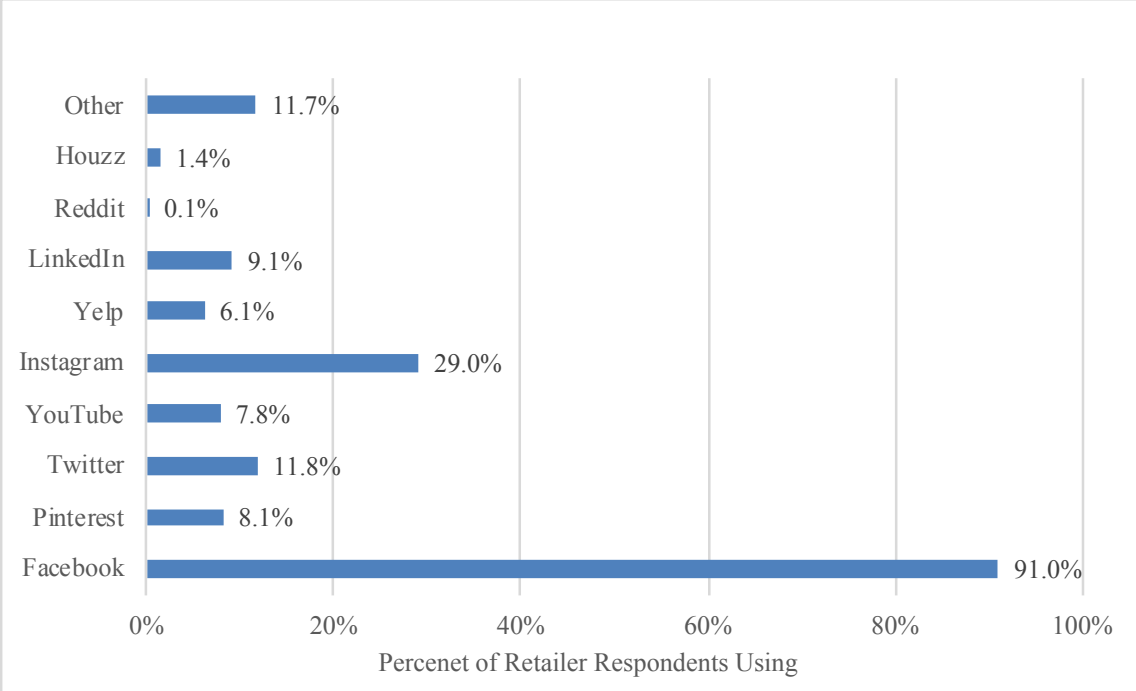
Region, State	Repeat customers	Negotiated	Brokered	Forward Contracted
		Percentage of Total Sales		
Appalachian	**60.2**	**18.0**	**1.6**	**16.7**
KY	63.6	11.1	1.6	19.2
NC	74.6	28.0	1.5	26.9
TN	32.9	10.7	0.3	10.2
VA	86.6	20.2	0.3	11.2
WV	77.8	15.7	19.6	16.9
Great Plains	**10.2**	**1.4**	**0.6**	**2.1**
KS	3.4	0.6	0.1	0.2
ND	63.5	0.5	14.5	15.9
NE	53.0	7.4	0.0	2.5
SD	41.7	11.0	5.1	46.3
Midwest	**68.0**	**42.2**	**3.3**	**31.0**
IA	43.8	21.3	14.0	19.8
IL	64.2	5.8	0.0	8.0
IN	43.7	6.0	2.6	5.2
MI	81.3	70.0	4.5	61.0
MN	84.7	89.2	2.2	18.1
MO	38.3	0.6	0.1	6.3
OH	59.9	5.4	1.1	1.7
WI	64.7	32.7	1.6	13.7
Mountain	**49.3**	**16.4**	**5.8**	**11.4**
AZ	92.8	40.2	1.6	45.5
CO	22.1	0.9	18.0	0.9
ID	27.4	0.3	0.1	0.8
MT	64.1	6.8	0.3	12.7
NV	9.9	0.0	0.0	7.1
UT	84.6	43.4	5.9	0.0
WY	46.0	25.0	0.0	12.6
Northeast	**77.3**	**23.6**	**7.2**	**6.9**
CT	67.3	0.0	1.6	0.0
DE	84.5	0.2	0.0	53.5
MA	68.5	3.4	0.0	18.0
MD	80.1	18.8	27.2	11.6
ME	74.2	23.8	2.1	7.8
NH	71.9	5.4	0.1	4.3
NJ	82.1	17.2	2.6	23.4

NY	67.2	38.2	1.3	4.1
PA	86.1	20.6	10.2	2.0
RI	23.1	12.1	0.0	0.4
VT	72.0	18.6	2.3	1.1
Pacific	**57.3**	**18.2**	**1.4**	**25.0**
AK	70.0	0.0	0.0	0.0
CA	74.4	31.3	1.5	29.8
HI	95.7	5.2	0.7	1.8
OR	35.6	4.5	0.4	18.0
WA	77.8	21.8	8.7	51.6
Southcentral	**75.2**	**46.0**	**1.4**	**31.7**
AR	78.3	0.0	0.0	13.3
LA	32.1	53.6	1.1	3.8
NM	72.0	5.1	0.2	0.1
OK	98.3	75.2	0.6	65.3
TX	82.2	36.6	2.0	32.5
Southeast	**38.3**	**10.2**	**4.7**	**6.9**
AL	81.0	17.5	8.0	6.7
FL	31.4	8.5	4.0	7.8
GA	72.7	19.1	8.6	2.3
MS	14.1	14.3	0.0	0.0
SC	52.4	12.6	4.1	2.7
Grand Total	**58.1**	**24.6**	**3.4**	**19.1**

Social Media Platform Use by Retailer Firms

This report is the first in the series of the Green industry surveys that incorporated information about use of social media platforms by retail nursery and garden centers. With generally increased reliance on consumer data analytics and predictive modeling in consumer goods sectors, U.S. Green industry firms are gradually increasing their online presence and digital marketing strategies to attract more customers and retain their existing customer base. As shown in Figure 17, the largest proportion of social media platforms used by the Green industry retail sector was *Facebook* (91%), which is predictable considering it has the largest worldwide network of users. The second most frequently used platform was *Instagram* (29%) which is also a *Facebook* company. A third tier of social media platforms used by Green industry firms included *Twitter* (12%), *LinkedIn* (9%), *Pinterest* (8%), *YouTube* (8%), and *Yelp* (6%). Only a small proportion of respondents used *Houzz* and *Reddit* social media platforms.

Figure 17. Social media platform use by U.S. Green industry firms in 2018



Point-of-Sale Materials

While half of the retailer firms reported using customer loyalty programs, only a small fraction (2%) used point-of-sale software or customer purchase cards as marketing and communications strategies to further develop business-to-customer relationships. The development and effective use of point-of-sale (POS) informational and advertising materials is another key component of the marketing practices toolkit used by Green industry retail firms. Survey participants were asked to indicate the type of POS materials used in retail stores. As shown in Figure 18, approximately 20 percent of the retailer firms used conventional signs, followed by bench tags (9%), and posters (8%) to provide necessary product information to end consumers. Only a small proportion of the retailer firms used QR codes (1.4%). While the majority of the retailers made the POS materials themselves (63%), some purchased their POS materials from supplier firms (13%), received their POS materials from a supplier for free (8%), or purchased from other sources (6%).

Figure 18. Point-of-sale materials used by U.S. Green industry retailer firms in 2018

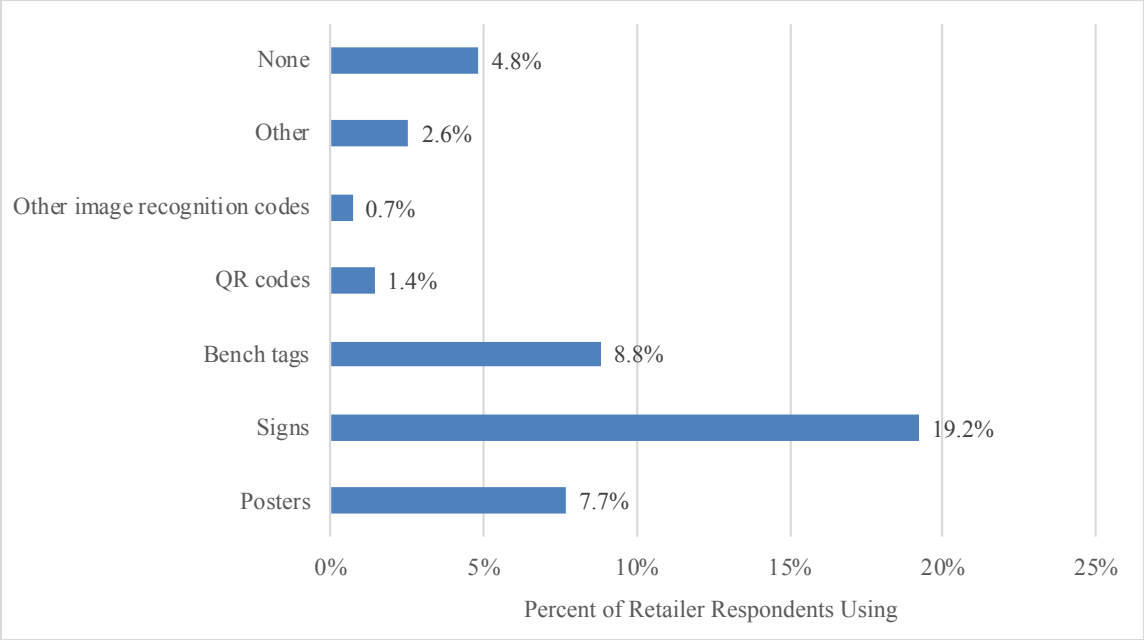
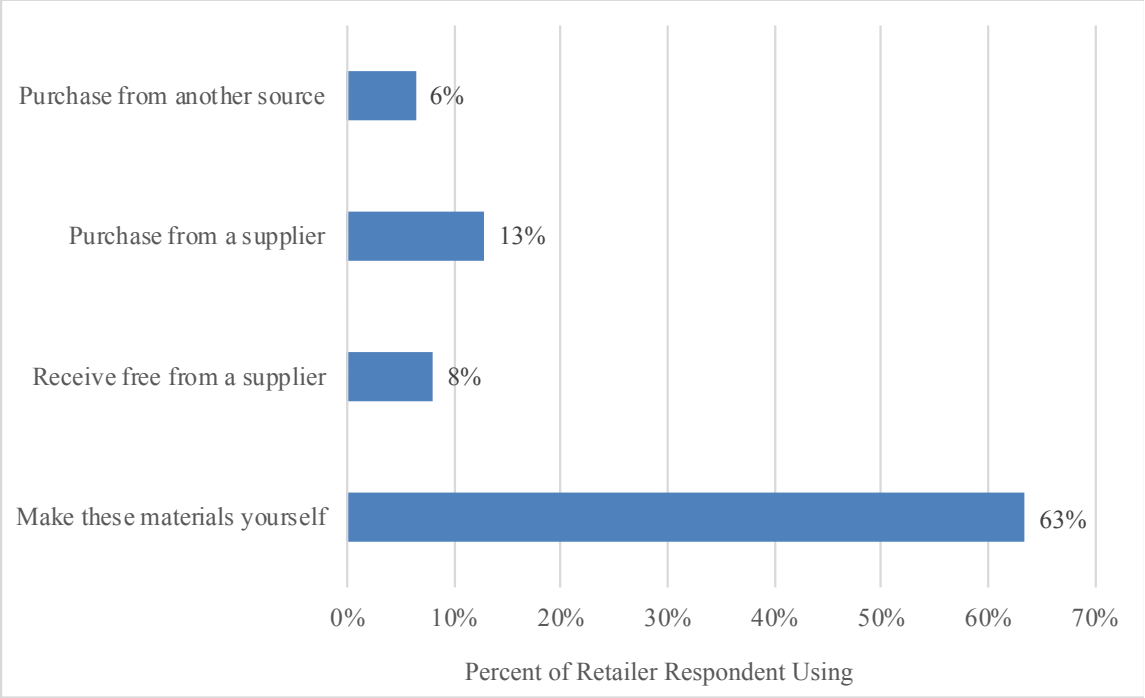


Figure 19. Sources of point-of-sale marketing materials used by U.S. Green industry retailer firms in 2018



Sales Transaction Methods

Respondents were asked to indicate the percentage of annual sales attributable to various transaction methods, including trade show orders, telephone orders, in-person orders, mail orders, website orders, email orders, and other types. The most common transaction method was traditional in-person orders, accounting for 50 percent of sales for all firms, 86 percent of sales for plant dealer firms, and 41 percent of grower firms, as shown in Figure 20. Telephone orders was the second most frequently used category, accounting for 24 percent of sales by all firms, and 11 and 28 percent for dealer and grower firms, respectively. Transactions via websites represented 13 percent and email orders accounted for 4 percent of all sales. Trade show orders and mail order sales each represented about 5 percent of all sales, up from 2 percent in 2013.

Table 15 presents information on sales transaction methods used by firms in the different regions and states. In-person orders accounted for over 80 percent of sales in 8 states (AK, AR, KS, MI, MO, MS, NM, and OK) and telephone orders accounted for over 50 percent of sales in 9 states (AL, CT, DE, HI, LA, MA, MT, OH, and WV). Website-based sales transactions were highest in Minnesota (27%), Texas (19%), and Tennessee (10%). Trade show orders accounted for 45, 19, and 18 percent in New Jersey, Wyoming, and Delaware, respectively. Email order transactions were more than 30 percent of all sales in 6 states (AZ, GA, NE, UT, WA, and WI).

Figure 20. Distribution of sales by transaction method for U.S. Green industry firms in 2018

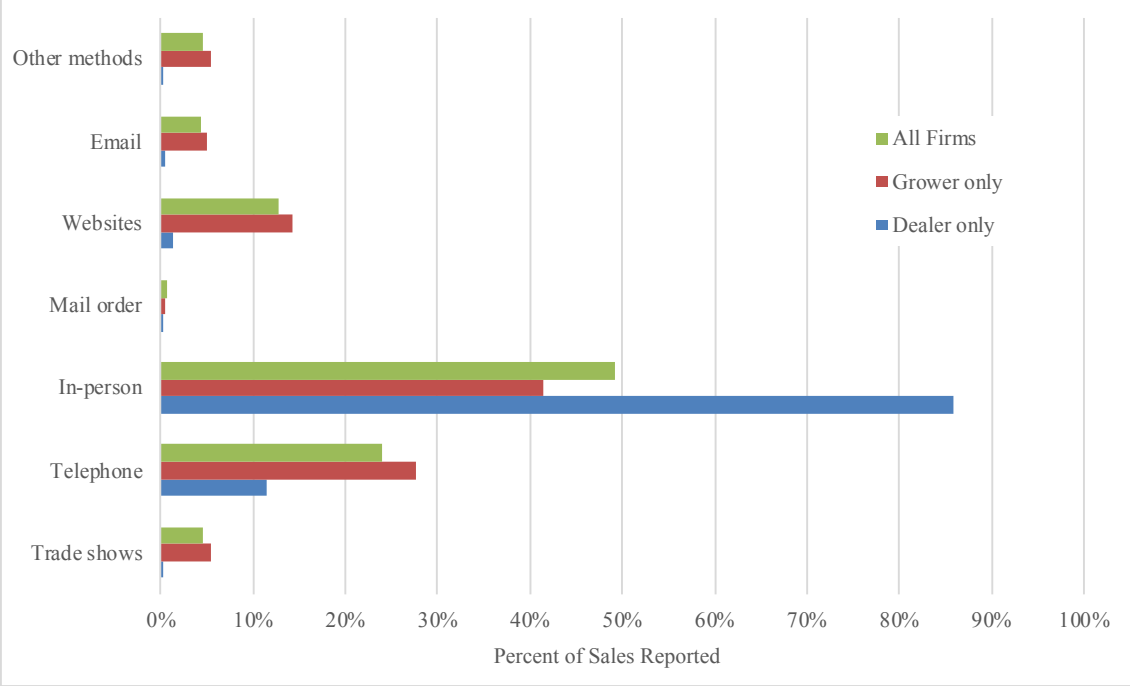


Table 15. Distribution of sales by transaction methods for U.S. Green industry firms in 2018, by state and region

Region, State	Trade shows	Telephone	In-person	Mail order	Internet/website	Email	Other
			Percentage of Total Sales				
Appalachian	**4.6**	**27.6**	**47.8**	**3.1**	**3.2**	**12.0**	**1.7**
KY	2.3	32.6	55.3	0.7	0.9	3.7	4.5
NC	5.2	20.4	56.2	0.7	4.2	11.4	1.9
TN	3.3	16.0	60.6	1.6	10.1	8.2	0.2
VA	6.6	33.2	32.3	8.5	0.6	18.1	0.6
WV	0.0	56.2	27.5	0.0	0.0	13.7	2.6
Great Plains	**1.3**	**18.0**	**49.7**	**1.3**	**0.3**	**16.5**	**12.8**
KS	0.0	9.2	89.9	0.9	0.0	0.0	0.0
ND	0.0	37.1	36.8	5.3	1.5	4.9	14.5
NE	3.0	19.0	41.3	0.0	0.0	36.6	0.0
SD	0.0	2.0	51.7	0.0	0.0	0.1	46.3
Midwest	**4.8**	**18.0**	**60.0**	**0.5**	**4.1**	**10.8**	**1.7**
IA	0.0	26.0	47.9	1.2	0.0	23.6	1.2
IL	0.0	35.0	45.0	0.1	0.4	10.8	8.8
IN	2.0	39.8	42.6	0.3	0.0	15.2	0.1
MI	7.2	4.2	84.8	0.6	0.8	1.2	1.2
MN	0.7	44.5	5.4	0.1	26.7	18.2	4.3
MO	0.0	6.3	86.9	0.0	0.3	6.2	0.3
OH	4.3	54.4	19.1	0.4	5.3	16.3	0.1
WI	5.0	14.3	35.8	0.8	4.5	38.4	1.2
Mountain	**1.0**	**28.3**	**37.9**	**0.0**	**0.7**	**31.9**	**0.2**
AZ	0.0	18.0	26.9	0.0	1.4	53.7	0.0
CO	0.1	28.8	57.3	0.0	0.7	12.6	0.6
ID	2.6	25.8	59.1	0.0	0.0	12.5	0.0
MT	0.0	52.3	33.2	0.0	0.0	14.5	0.0
NV	0.0	20.0	70.0	0.0	0.0	10.0	0.0
UT	0.0	34.8	22.6	0.0	0.4	42.2	0.0
WY	19.0	47.5	23.8	0.0	0.0	9.5	0.2
Northeast	**8.9**	**12.9**	**54.6**	**0.6**	**2.7**	**9.0**	**11.3**
CT	0.0	77.6	22.4	0.0	0.0	0.0	0.0
DE	18.1	72.6	8.8	0.0	0.1	0.4	0.0
MA	0.0	70.8	25.0	0.0	4.3	0.0	0.0
MD	11.2	24.8	36.1	0.2	0.8	26.8	0.1
ME	0.0	13.3	76.1	4.9	0.0	5.3	0.5
NH	0.0	16.3	79.1	1.4	0.6	2.6	0.0

NJ	45.2	11.3	18.4	0.1	0.0	23.0	2.0
NY	2.9	11.5	70.7	2.0	4.3	5.3	3.4
PA	0.4	10.1	61.6	0.2	3.3	4.1	20.4
RI	8.6	8.6	69.9	0.0	0.0	8.6	4.3
VT	4.1	27.6	52.2	0.8	0.0	15.2	0.0
Pacific	**4.6**	**22.5**	**53.3**	**0.1**	**3.3**	**13.0**	**3.1**
AK	0.0	5.0	93.8	0.0	0.6	0.6	0.0
CA	3.2	24.0	58.8	0.1	0.5	9.4	4.1
HI	1.5	74.5	7.1	0.0	0.5	7.4	9.0
OR	8.3	12.6	51.9	0.0	9.1	16.8	1.2
WA	2.7	36.7	22.5	0.2	3.7	33.8	0.5
Southcentral	**1.1**	**35.7**	**44.4**	**0.0**	**13.2**	**5.3**	**0.2**
AR	0.0	2.5	85.0	5.0	0.0	7.5	0.0
LA	1.2	86.6	7.3	0.0	2.0	2.9	0.0
NM	0.7	4.5	94.1	0.0	0.0	0.7	0.0
OK	0.0	18.2	81.8	0.0	0.0	0.0	0.0
TX	1.1	24.4	48.8	0.0	18.7	6.8	0.3
Southeast	**4.2**	**33.3**	**29.9**	**1.4**	**0.9**	**21.0**	**9.3**
AL	1.6	57.4	23.4	0.9	1.6	13.1	1.9
FL	3.3	31.1	36.5	0.3	1.2	14.5	13.0
GA	5.9	34.9	13.4	4.4	0.1	39.7	1.5
MS	0.0	0.0	100.0	0.0	0.0	0.0	0.0
SC	10.7	47.4	32.5	0.0	0.0	7.2	2.2
Grand Total	**4.6**	**23.9**	**49.3**	**0.6**	**4.3**	**12.8**	**4.5**

Advertising Expenditures

Respondents were asked to report the percentage of their total sales allocated to advertising and the percentage of their advertising budget spent on various media forms, as shown in Figure 21. Advertising expenditures represented 2 percent of total sales for all firms nationally. The most popular advertising media for all firms was social media, accounting for 23 percent of the total advertising budget, followed by trade shows (19%), websites (13%), radio/TV (11%), trade journals (9%), catalogs (8%), gardening publications (5%), newspapers (5%), and other media forms (5%).

For grower firms, 2.4 percent of annual sales were spent on advertising, and the most important media types as a share of the advertising budget were social media (32%) and trade shows (29%), followed by catalogs and gardening publications accounting for 10 and 9 percent, respectively, of advertising expenditures. For plant dealer firms, 4.9 percent of annual sales were spent on advertising, and the most important media types were radio/TV (45%) and social media (13%), followed by catalogs (9%), newspapers (9%), and websites (8%).

Advertising expenditures and media types used are summarized by region and state in Table 16. There were only 4 states where advertising expenditures represented 5 percent or more of annual sales: Delaware, Kansas, Louisiana, and New Hampshire. Social media represented 40 percent or more of the advertising budget in Alaska, Delaware, Idaho, Louisiana, Nevada, West Virginia, and Wyoming. Trade shows, the second largest category in advertising expenditures, accounted for 40 percent or more in Alabama, Arizona, Georgia, Maryland, New Jersey, Texas, and Virginia. Advertising on websites accounted for 40 percent or more of the total advertising budget in Hawaii, Illinois, Minnesota, Nevada, Oklahoma, Rhode Island, Washington, West Virginia, and Wisconsin. The top three states spending part of their advertising budgets on trade journals were Arizona, California, and Texas, while expenditures on radio or TV were highest in Iowa, Kansas, New Mexico, and South Dakota.

Figure 21. Distribution of advertising expenditures by U.S. Green industry firms in 2018

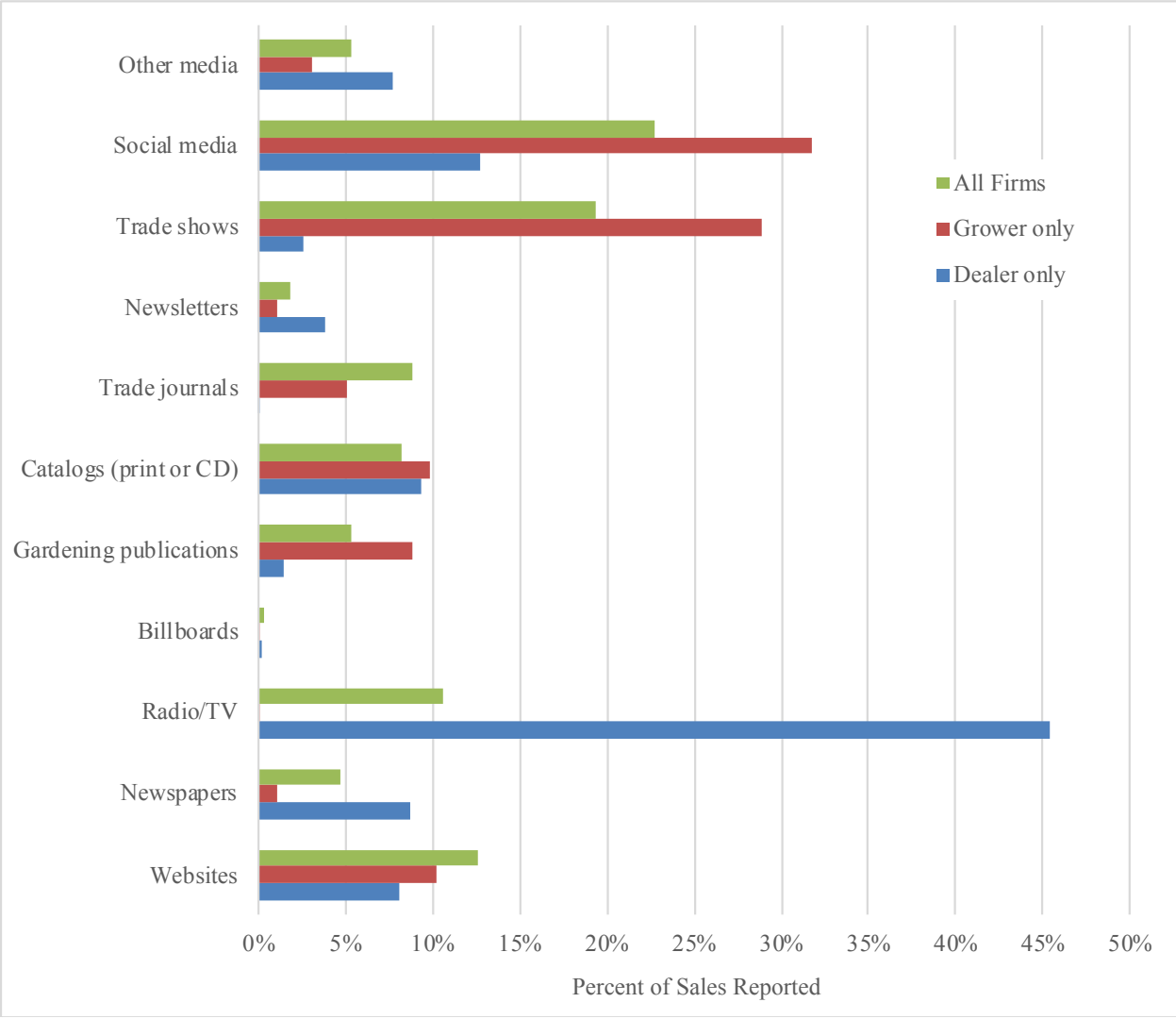


Table 16. Share of sales for advertising expenditures and distribution of advertising expenditures by media type by U.S. Green industry firms in 2018, by state and region

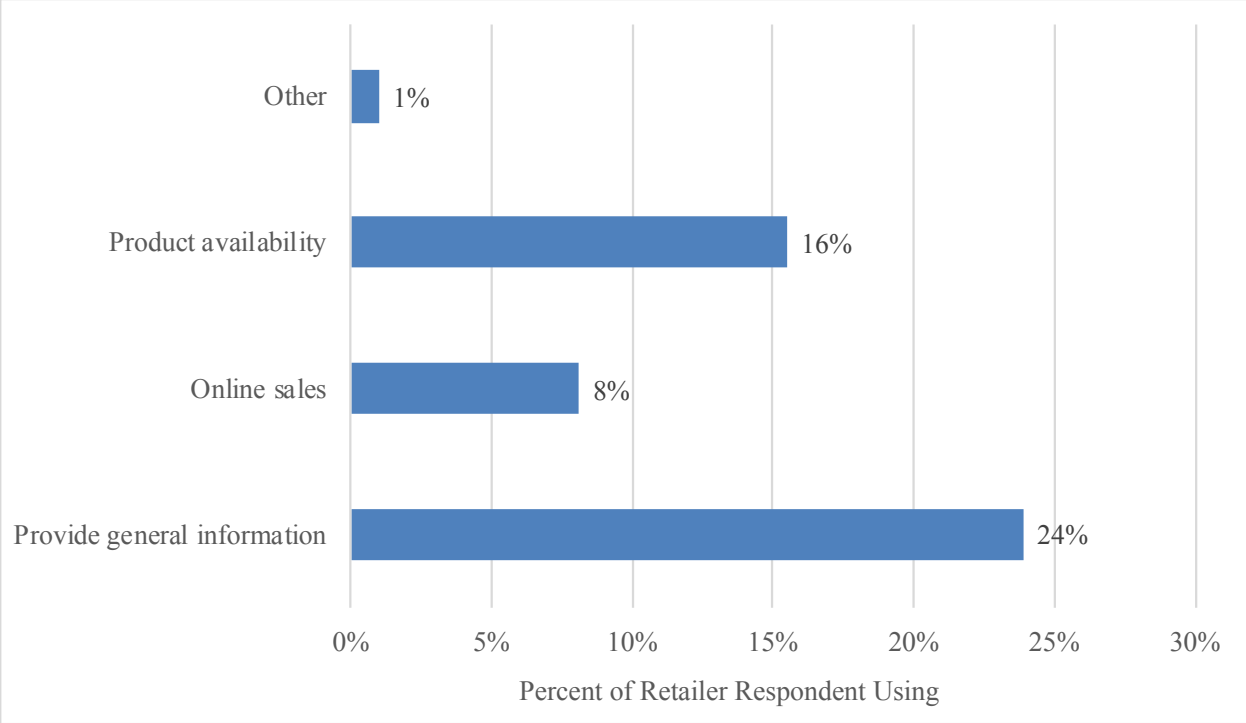
Region, State	Total advertising expenditures as percent of sales	Websites	Newspapers	Radio/TV	Billboards	Gardening publications	Catalogs (print or CD)	Trade journals	Newsletter	Trade shows	Social media	Other media
		Percentage of Total Expenditures on Advertising										
Appalachian	**2.0**	**21.7**	**6.8**	**3.5**	**0.1**	**0.7**	**17.9**	**5.0**	**6.5**	**23.1**	**12.8**	**1.9**
KY	1.8	18.0	9.3	14.5	0.0	0.1	15.7	2.2	8.0	29.0	0.6	2.5
NC	2.9	23.3	2.5	2.2	0.2	0.0	12.5	9.4	10.8	27.4	9.4	2.2
TN	1.4	15.3	16.6	1.8	0.0	2.5	28.1	1.4	4.2	8.3	20.6	1.1
VA	1.6	13.2	0.6	5.0	0.0	0.0	25.6	3.2	0.0	49.2	0.7	2.5
WV	3.8	56.4	2.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	40.1	1.0
Great Plains	**5.4**	**0.4**	**2.8**	**90.1**	**0.0**	**0.0**	**0.3**	**0.0**	**0.8**	**0.3**	**0.5**	**4.9**
KS	5.8	0.0	0.0	95.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9
ND	1.6	0.1	26.3	14.7	0.0	0.0	1.1	0.0	12.6	0.0	5.4	40.0
NE	3.3	6.9	39.0	21.5	0.0	0.0	4.8	0.0	12.8	6.4	8.6	0.0
SD	2.5	3.8	43.8	47.7	0.2	0.0	0.3	0.0	0.0	0.0	3.7	0.5
Midwest	**1.8**	**26.5**	**8.7**	**5.8**	**0.5**	**1.2**	**16.2**	**2.6**	**4.2**	**11.4**	**10.5**	**12.4**
IA	1.7	17.5	26.9	53.4	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.3
IL	4.3	39.6	6.6	6.4	0.0	0.0	26.3	0.1	2.0	1.8	3.2	13.9
IN	2.8	13.5	7.5	1.8	0.1	0.0	47.8	9.6	1.0	15.1	2.2	1.4
MI	1.1	20.3	1.8	1.7	0.3	0.1	3.1	1.8	0.3	11.7	23.6	35.2
MN	0.8	39.9	6.1	0.0	0.0	0.0	3.5	0.0	0.0	4.6	0.0	45.9
MO	2.4	10.1	46.1	9.5	0.1	1.4	0.3	0.0	9.2	5.4	16.8	1.2
OH	1.5	25.2	12.4	3.7	2.7	8.5	7.9	0.0	15.0	8.7	13.6	2.2
WI	4.0	43.5	2.2	5.3	0.6	1.6	9.4	1.0	8.1	18.3	8.0	1.8
Mountain	**2.0**	**11.2**	**5.4**	**1.9**	**0.2**	**2.6**	**31.8**	**2.4**	**6.9**	**15.5**	**19.4**	**2.5**
AZ	1.1	12.5	0.0	0.0	0.0	0.0	4.2	19.3	13.8	49.4	0.7	0.0
CO	1.7	5.9	6.7	6.3	0.1	12.5	18.6	0.0	23.4	2.5	15.2	8.6
ID	1.9	25.1	12.3	0.0	0.0	0.0	3.5	0.0	0.0	10.0	49.0	0.0
MT	0.5	0.0	98.5	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.0
NV	0.5	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0
UT	4.6	0.3	0.0	1.9	0.0	0.0	78.4	0.0	0.9	15.9	0.5	2.0
WY	1.3	14.8	1.6	0.0	9.8	0.0	0.0	0.0	0.0	24.6	49.2	0.0
Northeast	**3.0**	**10.1**	**6.0**	**2.3**	**0.2**	**29.7**	**2.2**	**2.8**	**1.0**	**35.7**	**8.2**	**1.7**
CT	1.1	0.0	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85.3
DE	7.3	1.5	1.6	0.0	0.0	0.0	6.9	0.0	0.0	6.9	83.0	0.0
MA	1.8	37.2	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.9	1.3

MD	1.1	21.9	5.7	0.0	0.0	8.2	17.3	5.8	0.0	40.2	0.0	0.9
ME	4.0	12.3	67.6	0.0	0.0	0.0	8.1	0.3	0.2	0.0	9.9	1.5
NH	5.3	21.3	44.5	6.4	0.0	0.0	0.0	0.0	0.0	0.0	16.2	11.5
NJ	1.6	6.3	1.5	1.0	0.0	0.0	1.9	0.0	0.5	79.1	9.2	0.6
NY	1.4	10.5	22.3	14.5	1.9	0.2	0.5	0.2	3.5	6.5	33.8	6.2
PA	4.8	9.6	2.3	0.4	0.0	39.6	2.2	3.6	0.7	37.8	3.1	0.6
RI	0.1	51.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2
VT	2.1	23.8	34.5	0.0	0.0	0.0	7.3	0.0	8.2	11.9	6.3	7.9
Pacific	**2.0**	**15.4**	**0.9**	**15.6**	**0.2**	**0.0**	**3.5**	**35.4**	**1.1**	**11.7**	**11.5**	**4.6**
AK	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
CA	3.4	14.6	0.3	17.0	0.0	0.1	0.6	42.4	0.8	10.6	10.6	3.0
HI	0.1	39.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	57.1
OR	0.6	14.6	4.2	9.7	1.1	0.0	19.1	2.6	2.0	18.5	17.5	10.8
WA	0.7	58.0	0.0	5.5	0.0	0.0	0.0	1.4	5.7	6.5	0.0	22.9
Southcentral	**4.9**	**2.6**	**3.9**	**2.4**	**0.5**	**0.3**	**6.7**	**3.8**	**0.5**	**16.5**	**60.8**	**2.0**
AR	3.0	27.8	27.8	0.0	0.0	0.0	44.4	0.0	0.0	0.0	0.0	0.0
LA	16.6	0.7	0.7	0.0	0.1	0.1	9.6	0.0	0.0	0.4	87.4	0.9
NM	1.9	6.0	16.7	30.7	0.0	4.1	1.0	0.0	0.0	0.0	0.0	41.4
OK	0.4	56.7	6.5	6.3	0.0	0.0	0.0	0.0	0.0	0.0	15.9	14.6
TX	2.6	3.3	10.3	5.7	1.5	0.4	0.4	13.7	1.7	58.8	3.4	0.6
Southeast	**1.2**	**19.3**	**5.8**	**2.1**	**0.1**	**3.1**	**7.5**	**5.7**	**0.9**	**34.7**	**8.3**	**12.5**
AL	1.6	9.9	0.4	0.0	0.1	0.0	2.8	9.1	11.7	61.5	4.0	0.4
FL	0.9	21.1	1.4	3.2	0.1	4.8	7.8	7.7	0.0	26.6	9.8	17.5
GA	2.3	15.7	16.9	0.0	0.2	0.0	2.7	1.7	2.4	53.7	3.3	3.5
MS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SC	3.1	19.2	3.1	0.3	0.0	0.0	35.0	0.0	0.0	22.4	17.8	2.1
Grand Total	**2.3**	**12.6**	**4.8**	**10.6**	**0.3**	**5.3**	**8.3**	**8.9**	**1.9**	**19.3**	**22.7**	**5.4**

Website Use and Management

With the increasing online presence of producer and retailer firms across all agricultural sectors, the U.S. Green industry is gradually incorporating transactions using website-based tools into their business practices. As shown in Figure 22, 24 percent of the U.S. Green industry firms use their websites to provide general information about their businesses, while 16 percent of the firms used websites to communicate product availability, and 8 percent used them to facilitate online sales transactions. As reported in the Advertising Expenditures subsection in this report, 13 percent of advertising expenditures in 2018 were allocated to websites, ranging from 3 percent in the southcentral region to 26 percent in the Midwest.

Figure 22. Website use and management by U.S. Green industry firms in 2018



Trade Show Participation

Trade shows have traditionally been an important business-to-business (B2B) marketing venue in the Green industry. Understanding the relationships between trade show participation and financial performance of producers and retailers could provide insights into the effectiveness of B2B advertising expenditures. Survey respondents were asked to report the number of trade shows attended annually, either with or without an exhibit. The overall average number of trade shows attended by all firms in 2018 was 0.8 with an exhibit, and 0.7 without an exhibit, similar to the attendance reported in 2013 (Table 17). Trade show attendance has declined significantly since the 2009 survey (conducted for production year 2008), in which the average number of shows attended was 2.27 and 1.79, with and without exhibits, respectively. The states with the highest average number of trade shows attended with an exhibit were Wyoming (3.0), North Carolina (1.6), Oregon (1.4), Arizona (1.4), Idaho (1.3), Georgia (1.2), Minnesota (1.2), and Florida (1.1), while the states with an average of at least 1 trade show attended without an exhibit were California, Kentucky, Michigan, Ohio, Rhode Island, South Dakota, and Wyoming.

Table 17. Average number of trade shows attended by U.S. Green industry firms in 2018, by state and region

Region, State	With exhibit	Without exhibit
Appalachian	**0.9**	**1.5**
KY	0.4	6.1
NC	1.6	0.8
TN	0.7	0.4
VA	0.3	0.5
WV	0.1	0.4
Great Plains	**0.3**	**0.6**
KS	0.0	0.0
ND	0.0	0.6
NE	0.7	0.8
SD	0.0	1.5
Midwest	**0.7**	**0.7**
IA	0.9	0.3
IL	0.5	0.1
IN	0.4	0.3
MI	0.8	1.4
MN	1.2	0.7
MO	0.2	0.5
OH	0.9	1.2
WI	0.7	0.2
Mountain	**0.8**	**0.5**
AZ	1.4	0.0
CO	0.3	0.6
ID	1.3	0.8
MT	0.1	0.0
NV	0.0	0.0
UT	0.5	0.8
WY	3.0	1.0

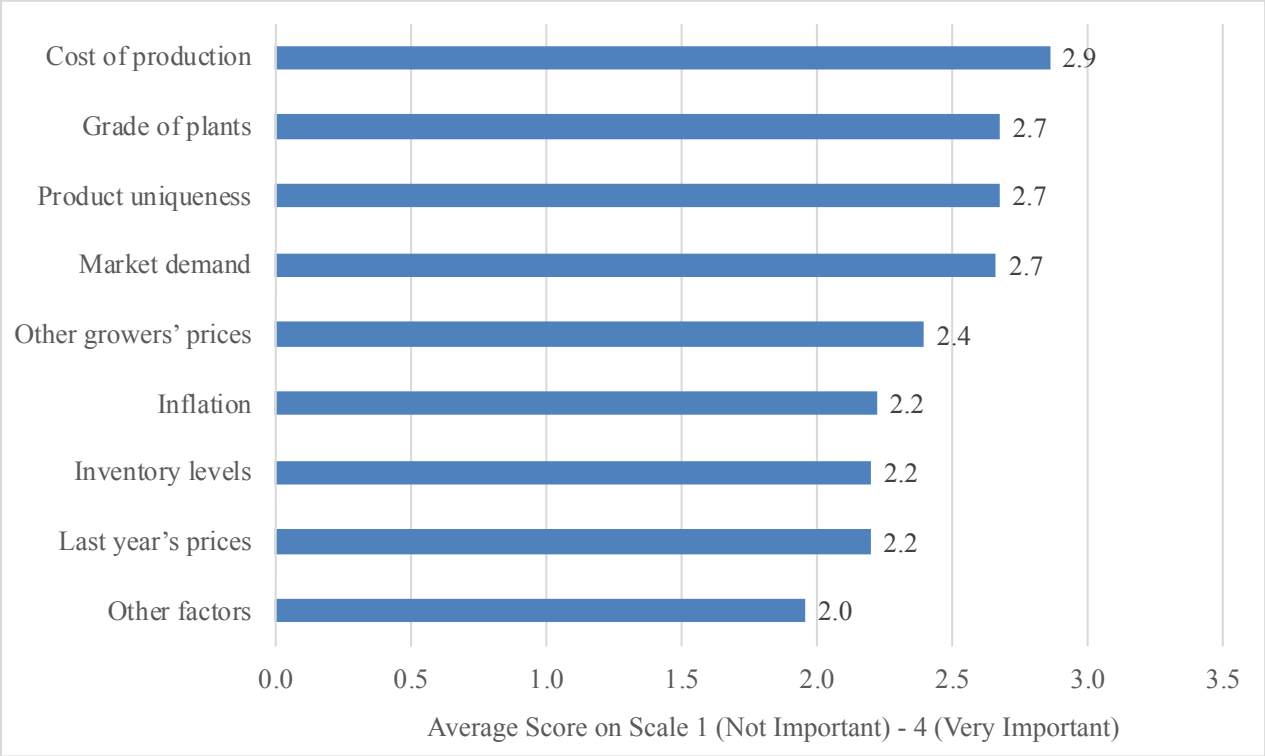
Region, State	With exhibit	Without exhibit
Northeast	**0.4**	**0.4**
CT	0.0	0.0
DE	0.1	0.0
MA	0.0	0.0
MD	1.0	0.8
ME	0.3	0.1
NH	0.0	0.7
NJ	0.5	0.8
NY	0.4	0.2
PA	0.5	0.2
RI	1.0	1.6
VT	0.5	0.1
Pacific	**1.1**	**1.0**
AK	0.0	0.0
CA	1.0	1.6
HI	0.3	0.4
OR	1.4	0.5
WA	0.7	0.0
Southcentral	**0.6**	**0.5**
AR	0.0	0.0
LA	0.2	0.6
NM	0.6	0.5
OK	0.3	0.0
TX	0.8	0.5
Southeast	**1.0**	**0.5**
AL	0.6	0.2
FL	1.1	0.6
GA	1.2	0.6
MS	0.0	0.0
SC	0.6	0.1
Grand Total	**0.8**	**0.7**

Factors Affecting Price Determination, Geographic Expansion, and the General Business Environment

Green industry managers' expectations and subjective considerations of factors affecting business performance are important considerations in assessing key areas of strengths, weaknesses, and opportunities. Survey respondents were asked to indicate the importance of various factors potentially affecting price determination, geographic expansion, and issues affecting the industry in general, by rating each of the factors on a scale of one to four, with four representing "very important," three representing "important," two representing "minor importance," and one representing "not important."

The eight factors considered as potentially affecting product prices were the cost of production, inflation, other grower prices, the grade of plants, market demand, product uniqueness, inventory levels, and last year's prices. With the average rating score of 2.9, cost of production was the highest-rated factor, followed by grade of plants (2.7), product uniqueness (2.7), market demand (2.7), other growers' prices (2.4), inflation (2.2), inventory levels (2.2), last year's prices (2.2), and other factors (2.0), as shown in Figure 23.

Figure 23. Factors affecting product pricing for U.S. Green industry firms in 2018



Cost of production was reported with an average ranting score above 3 in 11 states (AZ, DE, FL, ID, NC, NE, NH, OH, TN, VA, and VT), while the market demand factor was rated above 3.0 in NE, NH, and SC. Product uniqueness was rated at least 3.0 in six states (AR, AZ, DE, NH, NV, and TN), while the grade of plants was rated at least 3 in 10 states (CT, DE, GA, ID, IN, MI, NE, NH, SC, and TN). In general, the results for factors affecting product price determination were consistent with the previous results reported in 2013.

Table 18. Factors affecting product pricing for U.S. Green industry firms in 2018, by state and region

Region, State	Cost of production	Inflation	Other growers' prices	Grade of plants	Market demand	Product uniqueness	Inventory levels	Last year's prices	Other factors
	Average on Scale of 1-4 (1=not important, 2=moderate importance, 3=important, 4=very important)								
Appalachian	**3.0**	**2.2**	**2.4**	**2.8**	**2.7**	**2.8**	**2.3**	**2.3**	**1.9**
KY	2.8	2.3	2.3	2.6	2.7	2.6	2.0	2.3	1.8
NC	3.1	2.2	2.5	2.9	2.7	2.8	2.4	2.3	2.5
TN	3.3	2.1	2.5	3.0	2.9	3.0	2.3	2.5	1.0
VA	3.1	2.2	2.5	2.8	2.6	2.6	2.3	2.2	2.0
WV	2.7	2.1	1.9	2.4	2.2	2.4	2.2	1.9	2.0
Great Plains	**2.7**	**2.1**	**2.5**	**2.7**	**2.7**	**2.7**	**2.0**	**2.1**	**2.3**
KS	2.4	2.3	2.3	2.3	2.2	2.4	2.0	1.7	3.0
ND	2.2	1.8	2.1	2.6	2.6	2.8	1.8	2.0	2.0
NE	3.1	2.1	2.8	3.1	3.1	2.9	2.2	2.3	
SD	3.0	2.7	2.0	2.0	1.7	2.0	1.7	2.3	
Midwest	**2.9**	**2.3**	**2.4**	**2.8**	**2.7**	**2.7**	**2.2**	**2.3**	**2.0**
IA	2.7	2.0	2.0	2.3	2.3	2.5	2.2	2.0	3.0
IL	2.4	2.1	2.3	2.3	2.2	2.3	2.1	2.1	1.3
IN	3.0	2.4	2.6	3.1	2.8	2.8	2.2	2.4	1.8
MI	3.0	2.4	2.6	3.1	2.9	2.9	2.4	2.4	2.5
MN	2.8	2.1	2.2	2.4	2.1	2.1	1.9	1.9	1.0
MO	2.8	2.3	2.2	2.7	2.4	2.8	2.1	2.3	1.3
OH	3.3	2.4	2.4	2.9	2.8	2.9	2.1	2.3	2.6
WI	2.5	2.1	2.2	2.3	2.4	2.5	2.0	2.1	2.1
Mountain	**3.0**	**2.4**	**2.3**	**2.6**	**2.7**	**2.7**	**2.3**	**2.2**	**2.0**
AZ	3.2	1.8	2.8	2.0	2.2	3.0	2.0	2.0	
CO	3.0	2.5	2.2	2.8	2.8	2.7	2.5	2.4	3.3
ID	3.5	2.8	2.5	3.3	2.9	2.9	2.5	2.4	1.0

MT	2.7	2.2	2.2	2.4	2.6	2.6	1.7	1.8	1.0
NV	3.0	2.0	2.0	1.5	2.5	3.0	2.5	2.5	1.0
UT	2.9	2.3	2.0	2.1	2.0	2.1	1.9	1.9	1.0
WY	2.7	2.3	2.0	2.3	3.0	2.7	2.3	2.0	
Northeast	**2.7**	**2.2**	**2.2**	**2.5**	**2.4**	**2.4**	**2.0**	**2.2**	**1.8**
CT	3.0	2.0	2.3	3.3	2.5	2.5	2.7	2.5	
DE	3.8	2.3	2.6	3.1	3.0	3.1	1.9	2.5	2.0
MA	2.6	2.1	2.5	2.3	2.1	2.0	1.6	2.1	
MD	2.7	1.9	2.0	2.3	2.4	2.5	2.0	1.9	1.0
ME	2.9	2.2	2.2	2.5	2.4	2.7	1.9	2.6	1.0
NH	3.4	2.1	2.4	3.2	3.1	3.0	2.5	2.2	
NJ	2.4	2.2	2.2	2.4	2.3	2.2	1.8	2.1	1.7
NY	2.6	2.2	2.2	2.4	2.4	2.3	2.1	2.1	2.1
PA	2.6	2.3	2.2	2.4	2.4	2.2	2.0	2.1	1.8
RI	2.5	1.8	2.0	2.5	2.2	2.0	1.7	1.5	1.0
VT	3.1	2.1	2.4	2.4	2.5	2.8	1.7	2.1	1.0
Pacific	**2.7**	**2.2**	**2.3**	**2.5**	**2.5**	**2.5**	**2.1**	**2.1**	**2.2**
AK	3.0	2.7	1.7	2.7	2.3	2.7	2.0	2.3	
CA	2.5	2.1	2.3	2.4	2.4	2.4	2.0	2.0	2.1
HI	2.4	2.0	2.0	2.5	2.4	2.6	2.4	1.9	3.0
OR	3.0	2.3	2.4	2.7	2.8	2.8	2.1	2.1	2.3
WA	2.9	2.4	2.3	2.5	2.7	2.5	1.9	2.0	2.0
Southcentral	**2.7**	**2.3**	**2.4**	**2.6**	**2.6**	**2.7**	**2.1**	**2.1**	**1.8**
AR	3.0	3.0	2.0	2.7	2.0	3.0	1.5	2.0	
LA	3.0	2.5	2.8	2.8	3.0	2.9	2.2	2.4	2.0
NM	2.4	2.3	2.1	2.1	2.4	2.4	1.9	2.1	1.0
OK	3.0	1.9	2.2	2.5	2.3	2.6	2.0	1.9	1.0
TX	2.5	2.2	2.3	2.4	2.5	2.6	2.1	2.0	1.8
Southeast	**3.1**	**2.2**	**2.6**	**2.9**	**2.9**	**2.9**	**2.5**	**2.3**	**2.0**
AL	2.5	1.6	2.2	2.2	2.7	2.3	2.3	2.1	1.1
FL	3.1	2.2	2.6	2.8	2.9	2.9	2.5	2.3	2.1
GA	3.0	2.4	2.5	3.0	3.0	2.9	2.5	2.3	2.8
MS	2.5	2.0	2.0	2.5	2.0	2.0	2.0	2.0	
SC	2.9	2.1	2.7	3.1	3.1	2.9	2.6	2.2	2.0
Grand Total	**2.9**	**2.2**	**2.4**	**2.7**	**2.7**	**2.7**	**2.2**	**2.2**	**2.0**

Factors considered that potentially limit the geographic range or trading area for Green industry businesses included debt and equity capital availability, marketing, personnel, production, transportation, and plant offerings. The highest average ratings were for production, transportation, and plant offerings

(2.8), followed by personnel (2.5), marketing (2.3), and equity and debt capital (1.8), as shown in Figure 24. Production, as a factor limiting the geographic range, was rated above 3 in 14 states (AK, AR, CT, HI, KY, MT, ND, NH, NM, NV, SD, VA, WV, and WY) and plant offerings were rated above 3 in 9 states (AK, AR, AZ, CT, DE, NH, OK, VA, and VT). The transportation factor was rated above 3 in 14 states (AK, AZ, CA, GA, HI, IA, KS, KY, MT, NM, RI, SD, UT, and WV). Average rating scores on these factors are presented by state and region in Table 19.

Figure 24. Factors affecting geographic range for U.S. Green industry firms in 2018

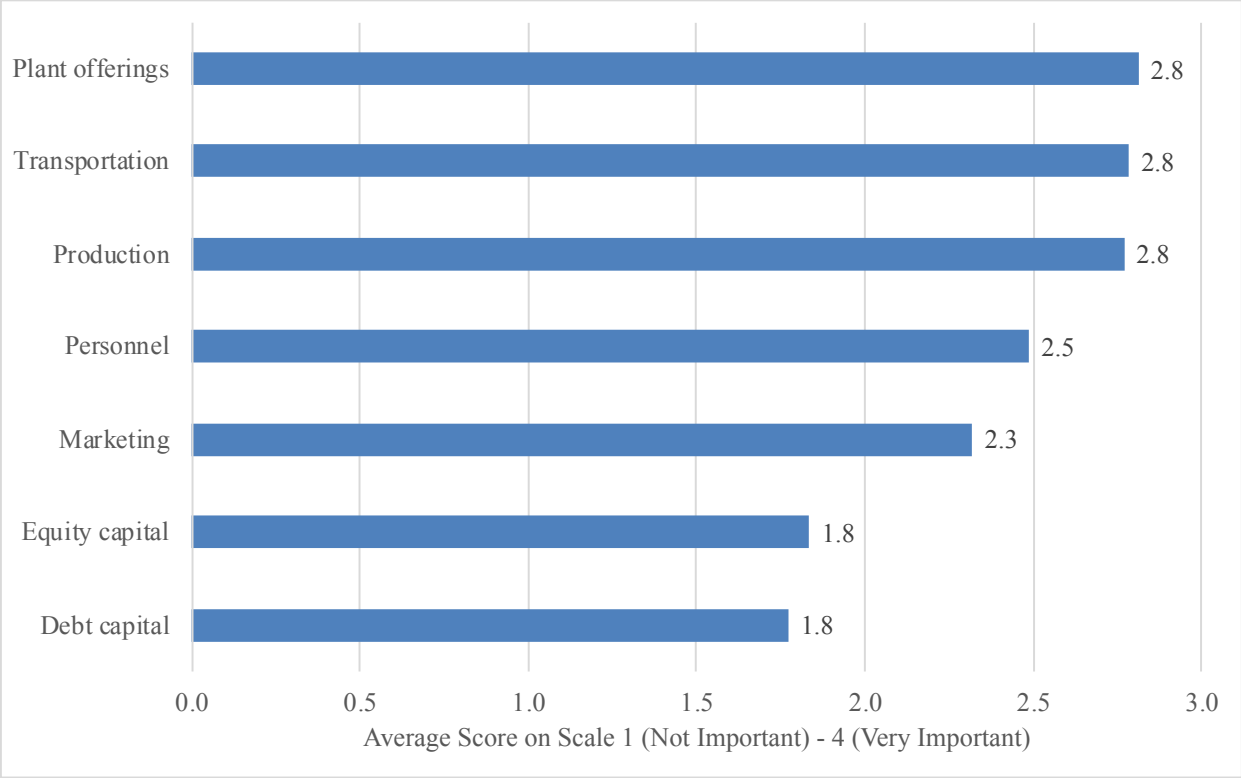


Table 19. Factors affecting the geographic range of U.S. Green industry firms in 2018, by state and region

Region, State	Debt capital	Equity capital	Marketing	Personnel	Production	Transportation	Plant offerings
	Average on Scale of 1-4 (1=not important, 2=moderate importance, 3=important, 4=very important)						
Appalachian	**1.9**	**1.9**	**2.4**	**2.6**	**3.0**	**2.8**	**2.9**
KY	1.9	2.0	2.6	3.0	3.3	3.1	2.8

NC	1.9	1.9	2.2	2.4	3.0	2.8	2.9
TN	1.8	1.8	2.4	2.5	2.6	2.6	2.9
VA	1.6	1.7	2.2	2.3	3.1	2.7	3.1
WV	2.1	2.3	2.9	2.5	3.1	3.1	3.0
Great Plains	**1.9**	**1.9**	**2.4**	**2.5**	**2.7**	**2.7**	**2.5**
KS	2.0	2.0	2.4	2.6	2.2	3.2	3.0
ND	2.0	1.4	2.7	2.4	3.2	2.0	2.1
NE	1.7	1.8	2.2	2.3	2.5	2.5	2.5
SD	2.3	3.0	3.0	4.0	3.3	4.0	2.3
Midwest	**1.8**	**1.8**	**2.3**	**2.5**	**2.6**	**2.6**	**2.8**
IA	1.8	1.6	2.4	2.2	2.8	3.2	3.0
IL	2.1	2.1	2.2	2.5	2.8	2.2	2.8
IN	1.9	2.0	2.4	2.6	2.7	2.6	2.6
MI	1.8	1.9	2.2	2.6	2.6	2.8	2.8
MN	1.8	1.8	2.3	2.5	2.7	2.3	2.5
MO	1.7	1.8	2.3	2.9	2.5	2.8	2.9
OH	1.8	1.8	2.3	2.7	2.6	2.7	2.6
WI	1.4	1.5	2.2	2.2	2.6	2.3	2.9
Mountain	**1.7**	**1.8**	**2.2**	**2.8**	**2.8**	**2.9**	**2.7**
AZ	1.0	1.7	1.7	2.7	3.0	3.3	3.3
CO	2.0	2.1	2.2	2.8	2.6	2.7	2.7
ID	1.8	1.8	1.8	2.4	2.5	2.9	2.6
MT	1.3	1.2	2.6	3.1	3.4	3.1	2.4
NV	1.0	1.0	3.0	3.5	4.0	1.5	2.0
UT	1.3	1.3	2.5	2.8	2.8	3.2	2.8
WY	1.3	1.7	3.3	2.7	3.5	3.0	3.0
Northeast	**1.7**	**1.8**	**2.4**	**2.4**	**2.7**	**2.6**	**2.8**
CT	2.7	3.0	2.3	2.3	3.3	2.0	4.0
DE	2.0	2.0	2.5	2.0	2.7	2.7	3.3
MA	2.1	2.1	2.2	2.6	2.7	2.9	2.6
MD	1.7	1.7	2.4	3.0	2.6	2.8	2.5
ME	1.5	1.7	2.4	2.0	2.4	2.6	2.9
NH	1.5	1.7	3.2	2.8	3.2	2.2	3.3
NJ	1.8	1.9	2.0	2.6	2.9	2.4	2.8
NY	1.5	1.6	2.5	2.2	2.6	2.5	2.7
PA	1.8	1.8	2.3	2.5	2.7	2.7	2.8
RI	2.0	2.0	2.6	3.2	2.8	3.2	2.2
VT	2.0	2.0	2.0	1.0	2.7	2.7	3.4
Pacific	**1.8**	**1.8**	**2.2**	**2.5**	**2.9**	**3.1**	**2.9**
AK	2.0	1.3	2.7	3.0	3.7	3.7	3.3
CA	1.7	1.9	2.2	2.6	3.0	3.1	3.0

HI	1.9	2.3	2.1	2.9	3.3	3.3	3.0
OR	1.9	1.9	2.2	2.3	2.6	3.0	2.6
WA	1.4	1.3	2.0	2.1	2.5	2.9	2.7
Southcentral	**1.8**	**1.9**	**2.4**	**2.6**	**2.9**	**2.9**	**2.8**
AR	1.0	1.0	2.0	2.0	3.5	3.0	4.0
LA	2.2	2.2	2.6	2.9	3.0	3.0	2.7
NM	1.9	1.9	2.7	2.9	3.4	3.3	2.6
OK	1.7	1.7	1.9	2.3	3.0	2.7	3.6
TX	1.6	1.7	2.4	2.4	2.7	2.8	2.8
Southeast	**1.8**	**1.8**	**2.4**	**2.4**	**2.8**	**2.8**	**2.8**
AL	1.3	1.3	1.7	1.7	2.2	2.6	2.4
FL	1.8	1.9	2.4	2.5	2.9	2.8	2.9
GA	1.9	1.9	2.2	2.4	2.6	3.1	2.7
MS	3.5	2.5	2.5	2.0	3.0	2.5	3.0
SC	1.3	1.4	2.2	2.1	2.5	2.5	2.8
Grand Total	**1.8**	**1.8**	**2.3**	**2.5**	**2.8**	**2.8**	**2.8**

Factors or issues that may potentially affect the overall business environment in the Green industry included weather uncertainty, land, market demand, labor, water supply, debt and equity capital availability, own managerial expertise, competition/price undercutting, environmental regulations, other government regulations, ability to hire competent management, and ability to hire competent hourly employees. The highest average importance rating score was for weather uncertainty and market demand (3.2), followed by labor (2.7), own managerial expertise (2.6), ability to hire competent hourly employees (2.5), competition/price undercutting (2.4), the balance of power with buyers/customers (2.3), environmental regulations and other governmental regulations (2.2), water supply, ability to hire competent management, and land (2.1), the balance of power with suppliers and vendors (2.0), equity capital (1.9), and debt capital (1.8), as shown in Figure 25. State and regional average ratings for these factors are presented in Table 20. Weather uncertainty was rated at or above 3 in 6 regions, namely the Appalachian, Great Plains, Midwest, Mountain, Northeast, and Southcentral, while market demand was rated 3 or above in all regions.

Figure 25. Factors impacting the general business environment for U.S. Green industry firms in 2018

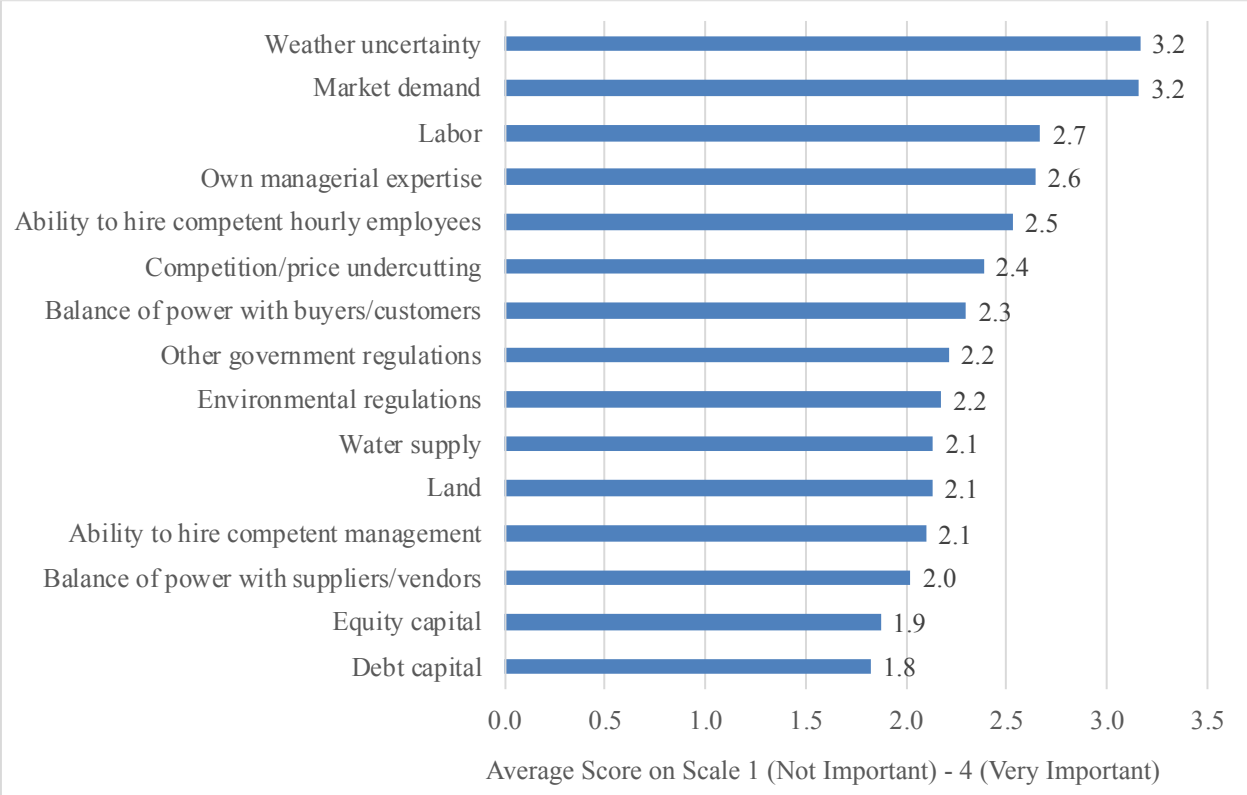


Table 20. Factors affecting the general business environment for U.S. Green industry firms in 2018, by state and region

Region, State	Weather uncertainty	Land	Market demand	Labor	Water supply	Debt capital	Equity capital	Own managerial expertise
	Average on Scale of 1-4 (1=not important, 2=moderate importance, 3=important, 4=very important)							
Appalachian	**3.2**	**2.2**	**3.3**	**2.7**	**2.2**	**2.0**	**2.1**	**2.7**
KY	3.1	1.7	3.5	2.7	2.0	2.1	2.3	2.7
NC	3.2	2.4	3.3	2.6	2.5	2.0	2.0	2.7
TN	3.1	2.4	3.3	3.0	1.9	2.0	2.2	2.8
VA	3.5	2.5	3.4	2.9	2.4	2.0	2.2	2.8
WV	3.4	2.2	2.9	2.4	1.7	1.8	1.9	2.6
Great Plains	**3.4**	**1.9**	**3.0**	**2.5**	**1.8**	**1.9**	**1.9**	**2.5**
KS	3.2	1.6	2.6	2.4	2.0	2.0	2.0	2.8

ND	3.5	2.1	2.8	2.3	2.1	1.9	1.6	2.1
NE	3.4	1.9	3.3	2.5	1.5	1.9	1.9	2.4
SD	4.0	2.3	3.0	3.3	2.0	1.7	2.3	3.3
Midwest	**3.4**	**2.1**	**3.1**	**2.6**	**1.8**	**1.8**	**1.8**	**2.7**
IA	3.5	2.0	3.0	2.4	1.5	1.8	1.9	2.5
IL	3.3	2.2	3.3	2.6	2.2	1.8	2.0	2.6
IN	3.4	2.2	3.0	2.6	2.0	1.9	2.1	2.8
MI	3.4	2.0	3.2	2.9	1.7	1.8	1.8	2.7
MN	3.2	2.0	3.1	2.5	1.7	1.5	1.9	2.8
MO	3.3	1.7	3.2	3.2	2.2	1.9	2.1	2.7
OH	3.4	2.0	3.0	2.7	1.8	1.9	1.9	2.7
WI	3.5	2.2	3.2	2.2	1.7	1.4	1.5	2.4
Mountain	**3.0**	**2.2**	**3.0**	**2.8**	**2.3**	**1.8**	**1.8**	**2.8**
AZ	2.0	2.4	4.0	3.6	2.6	1.5	1.0	3.3
CO	3.0	2.1	2.8	2.8	2.5	2.1	2.1	3.0
ID	3.1	2.3	3.3	3.1	2.4	2.2	2.2	2.7
MT	3.4	2.1	3.1	2.4	1.4	1.4	1.5	2.9
NV	3.5	1.5	3.5	3.0	1.5	1.0	1.0	2.5
UT	2.6	2.0	2.9	2.1	2.1	1.1	1.1	1.9
WY	3.8	3.0	3.3	3.3	2.5	1.5	1.5	2.0
Northeast	**3.3**	**2.1**	**3.3**	**2.5**	**1.9**	**1.8**	**1.7**	**2.5**
CT	2.5	2.5	2.3	2.5	2.5	2.8	3.0	2.5
DE	3.4	2.8	3.0	2.1	1.9	2.2	1.9	2.3
MA	3.9	2.3	3.0	2.5	2.1	1.8	2.0	3.5
MD	3.4	1.9	3.3	2.9	2.6	1.7	1.6	2.9
ME	3.1	2.0	3.0	1.8	1.7	1.4	1.6	2.6
NH	3.5	2.3	3.5	2.3	2.6	1.3	1.2	3.0
NJ	3.3	2.3	3.0	2.7	1.9	1.6	1.8	2.3
NY	3.4	2.0	3.6	2.4	1.8	1.8	1.6	2.5
PA	3.3	2.2	3.2	2.7	2.0	1.9	1.9	2.4
RI	2.8	1.3	3.2	3.2	1.5	1.8	1.5	2.8
VT	3.3	1.9	3.0	1.9	1.3	1.7	1.7	2.0
Pacific	**2.9**	**2.1**	**3.2**	**2.8**	**2.6**	**1.8**	**1.8**	**2.7**
AK	3.0	1.5	2.7	2.7	2.0	2.3	2.0	2.0
CA	2.9	2.2	3.3	2.9	2.9	1.8	1.9	2.6
HI	2.6	2.3	3.1	2.6	2.0	1.5	2.0	2.7
OR	2.9	2.1	3.1	2.9	2.3	1.8	2.0	2.7
WA	2.7	1.8	3.3	2.6	2.0	1.5	1.4	2.9
Southcentral	**3.3**	**2.1**	**3.1**	**2.9**	**2.2**	**1.8**	**1.8**	**2.6**
AR	3.7	1.0	3.0	2.5	2.5	1.0	1.0	3.0
LA	3.5	2.3	3.2	3.1	2.1	2.1	2.0	2.7

NM	3.1	2.4	3.0	2.8	2.6	1.9	1.9	2.5
OK	3.4	2.4	3.4	2.5	2.2	1.6	1.6	2.4
TX	3.2	2.0	3.0	2.8	2.2	1.7	1.8	2.6
Southeast	**2.9**	**2.2**	**3.2**	**2.6**	**2.3**	**1.9**	**1.9**	**2.7**
AL	3.1	2.3	3.4	2.8	2.6	1.8	1.6	2.6
FL	2.9	2.2	3.2	2.7	2.3	1.8	1.9	2.7
GA	3.0	2.2	3.2	2.7	2.3	2.0	2.1	2.8
MS	3.5	1.0	3.0	2.0	1.5	3.0	2.0	1.5
SC	3.2	1.8	3.3	2.0	2.0	1.8	1.7	2.5
Grand Total	**3.2**	**2.1**	**3.2**	**2.7**	**2.1**	**1.8**	**1.9**	**2.6**

Table 20 (continued). Factors affecting the general business environment for U.S. Green industry firms in 2018, by state and region

Region, State	Competition/ price undercutting	Environmental regulations	Other government regulations	Ability to hire competent management	Ability to hire competent hourly employees	Balance of power with suppliers/vendors	Balance of power buyers/customers
	Average on Scale of 1-4 (1=not important, 2=moderate importance, 3=important, 4=very important)						
Appalachian	**2.4**	**2.1**	**2.2**	**2.2**	**2.7**	**2.2**	**2.4**
KY	2.3	2.1	2.3	2.3	2.5	2.3	2.5
NC	2.4	2.2	2.2	2.2	2.7	2.2	2.6
TN	2.2	2.2	2.3	2.3	2.9	2.1	2.2
VA	2.8	1.7	1.8	2.1	2.5	2.1	2.1
WV	2.2	2.0	2.0	2.0	2.6	2.3	2.4
Great Plains	**2.1**	**1.8**	**1.8**	**2.3**	**2.5**	**2.0**	**2.2**
KS	2.2	1.8	2.2	2.3	2.4	2.3	2.4
ND	1.8	1.9	1.8	2.3	2.5	1.8	2.2
NE	2.2	1.7	1.7	2.2	2.4	1.9	2.2
SD	2.3	1.7	1.7	2.7	3.3	2.0	1.7
Midwest	**2.3**	**2.0**	**2.1**	**2.2**	**2.6**	**2.0**	**2.3**
IA	2.2	1.9	2.1	2.4	2.6	2.4	2.7
IL	2.4	2.2	2.3	2.2	2.7	2.0	2.3
IN	2.4	2.1	2.0	2.1	2.5	2.1	2.3
MI	2.4	2.2	2.3	2.4	2.9	2.0	2.5
MN	2.1	2.1	2.2	1.9	2.4	1.8	2.0
MO	2.4	1.8	2.0	2.5	3.0	2.4	2.6
OH	2.4	2.0	1.9	2.3	2.7	2.0	2.2
WI	2.1	1.7	1.8	1.8	2.2	1.6	1.9
Mountain	**2.2**	**2.1**	**2.2**	**2.3**	**3.0**	**2.0**	**2.1**

AZ	3.3	2.6	2.6	2.2	3.4	1.8	2.4
CO	2.1	2.3	2.3	2.3	3.0	2.1	2.2
ID	2.2	1.8	1.8	2.4	2.5	1.9	1.9
MT	2.4	1.7	2.0	1.9	2.7	1.7	2.0
NV	2.0	2.5	3.0	4.0	4.0	2.5	2.0
UT	1.8	1.6	1.6	1.7	2.9	1.5	1.5
WY	3.3	3.0	3.0	2.7	4.0	2.5	2.5
Northeast	**2.3**	**2.2**	**2.2**	**1.9**	**2.3**	**2.0**	**2.3**
CT	1.5	2.3	2.0	2.0	1.8	2.0	2.0
DE	2.6	1.8	2.2	1.9	2.1	1.7	2.1
MA	2.4	2.1	1.9	2.3	2.5	2.8	2.9
MD	2.6	2.4	2.2	2.2	2.9	2.1	2.5
ME	2.1	2.1	2.2	1.4	1.9	1.7	1.8
NH	2.3	2.6	2.4	2.0	2.3	2.1	2.3
NJ	2.3	2.1	2.4	1.9	2.4	1.9	2.3
NY	2.5	2.2	2.3	1.7	2.0	1.8	2.3
PA	2.3	2.3	2.2	2.1	2.6	2.2	2.4
RI	2.5	2.2	2.7	2.0	3.2	1.3	1.5
VT	1.5	1.1	1.1	1.0	1.7	1.4	2.0
Pacific	**2.4**	**2.3**	**2.4**	**2.1**	**2.5**	**2.0**	**2.2**
AK	2.3	1.7	1.7	1.7	2.7	2.0	2.7
CA	2.4	2.4	2.5	2.0	2.5	2.0	2.2
HI	2.3	2.6	2.7	2.3	2.5	2.3	2.6
OR	2.3	2.3	2.5	2.3	2.6	1.8	2.0
WA	2.1	2.0	2.1	2.3	2.3	1.8	2.0
Southcentral	**2.4**	**2.1**	**2.2**	**2.1**	**2.5**	**2.0**	**2.3**
AR	2.3	2.0	2.0	2.5	2.5	3.0	4.0
LA	2.8	2.3	2.3	2.4	2.8	2.3	2.5
NM	2.6	1.9	2.1	2.5	2.6	1.8	2.0
OK	1.8	1.9	2.1	1.8	2.1	1.9	2.0
TX	2.2	2.0	2.1	1.9	2.3	1.9	2.2
Southeast	**2.6**	**2.3**	**2.3**	**2.1**	**2.5**	**2.1**	**2.4**
AL	2.4	2.4	2.2	2.0	2.0	1.4	1.7
FL	2.6	2.3	2.3	2.1	2.5	2.1	2.5
GA	2.6	2.3	2.2	2.4	2.8	2.1	2.3
MS	2.0	2.5	3.0	2.5	2.5	2.0	2.0
SC	2.4	1.9	2.0	1.6	2.2	2.0	2.2
Grand Total	**2.4**	**2.2**	**2.2**	**2.1**	**2.5**	**2.0**	**2.3**

References

Brooker, J.R., D. Eastwood, C. Hall, K. Morris, A. Hodges, and J. Haydu. 2005. Trade flows and marketing practices within the United States nursery industry: 2003. Southern Cooperative Series Bulletin 404, Univ. Tenn. Ag. Exp. Sta. http://aggie-horticulture.tamu.edu/faculty/hall/publications/ SCB404.pdf. Accessed September 25, 2015.

Brooker, J.R., R.A. Hinson, and S.C. Turner. 2000. Trade flows and marketing practices within the United States nursery industry: 1998. Southern Cooperative Series Bulletin 397, Univ. Tenn. Ag. Exp. Sta. http:// web.utk.edu/~brooke00/RESEARCH/SCB397.pdf. Accessed September 25, 2015.

Brooker, J.R., S.C. Turner, and R.A. Hinson. 1995. Trade flows and marketing practices within the United States nursery industry: 1993. Southern Cooperative Series Bulletin 384, Univ. Tenn. Ag. Exp. Sta. http:// web.utk.edu/~brooke00/RESEARCH/scbn384.htm. Accessed September 25, 2015.

Brooker, J. R., and S.C. Turner. Trade flows and marketing practices within the United States nursery industry. 1990. Southern Cooperative Series Bulletin 358, Univ. Tenn. Ag. Exp. Sta. http://aggie-horticulture. tamu.edu/faculty/hall/publications/SCSB358.pdf. Accessed September 25, 2015.

Dillman, D.A., J.D. Smyth, and L.M. Christian. 2009. *Internet, Mail and Mixed-Mode Surveys: The Tailored Design Method*, 3rd edition. John Wiley: Hoboken, NJ.

Guo, Y., T. Starman, and C. Hall. 2019. Growth, quality, and economic value responses of bedding plants to reduced water usage. *HortScience*. 54(5):856-864.

White, S.A., J.S. Owen, J.C. Majsztrik, L.R. Oki, P.R. Fisher,C.R. Hall, J.D. Lea-Cox, and R.T. Fernandez. 2019. Greenhouse and nursery water management characterization and research priorities in the USA. *Water*, *11*, 2338.

Hodges, A., C. Hall, M. Palma, and H. Khachatryan. 2015. Economic contributions of the Green industry in the United States in 2013. *HortTechnology*, 25(6), 805-814.

Hodges, A., H. Khachatryan, C. Hall, and M. Palma. 2015. Production and marketing practices and trade flows in the United States Green industry, 2013. Southern Cooperative Series Bulletin 411, 1051 Multistate Research Project, May 2015. http://www.fred.ifas.ufl.edu/economic-impact-analysis/ publications.shtml. Accessed August 30, 2015.

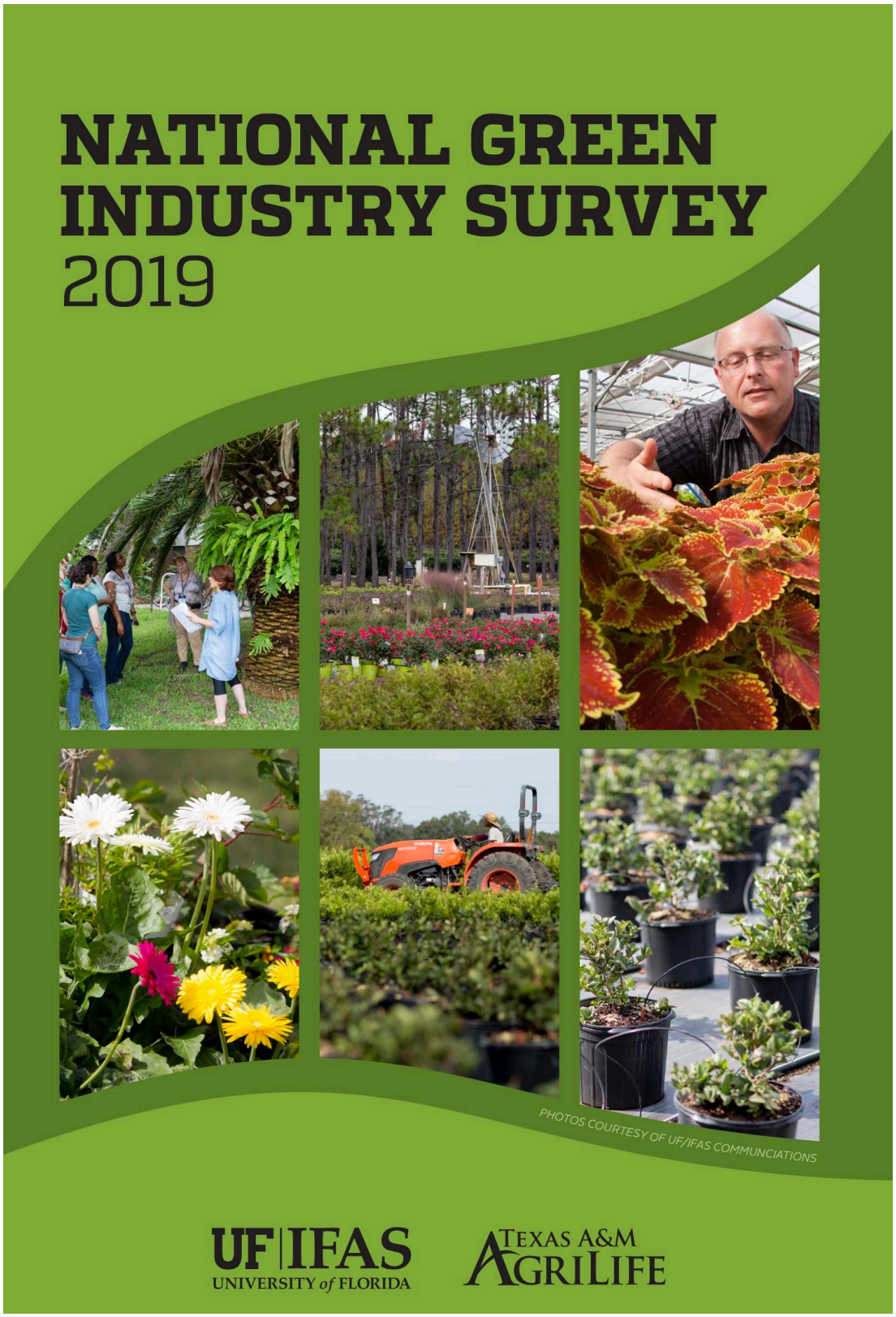
Hodges, A., M. Palma, and C. Hall. 2010. Trade flows and marketing practices within the United States nursery industry, 2008. Southern Cooperative Series Bulletin 411, S-1051 Multistate Research Project. http://aggie-horticulture.tamu.edu/faculty/hall/publications/SCSB411.pdf. Accessed August 30, 2015.

Ingram, D., C. Hall, and J. Knight. 2018. Global warming potential, variable costs, and water use of a model greenhouse production system for 11.4-cm annual plant using life cycle assessment. *HortScience*, 53(4):441–444. 2018. https://doi.org/10.21273/HORTSCI12602-17.

Ingram, D., C. Hall, and J. Knight. 2017. Modeling global warming potential, variable costs, and water use of young plant production system components using life cycle assessment. *HortScience*. 52(10):1356-1361.

Ingram, D., and C. Hall. 2015. Life cycle assessment used to determine potential midpoint environment impact factors and water footprint of field-grown tree production inputs and processes. *Journal of the American Society of Horticultural Sciences*, 140(1):102–107.

Appendix A-National Green Industry Survey Questionnaire



2019 National Green Industry Survey

Dear Green Industry Business Owner or Manager:

This survey is being conducted by the *Green Industry Research Consortium*, a group of University-based horticulturists and agricultural economists, with funding support by the Horticultural Research Institute (HRI). This represents the seventh time that this survey has been conducted by our group since 1989. The purpose of the survey is to document trends in production, marketing and retailing practices in the U.S. Green Industry. The survey is being sent to randomly selected Green industry firms throughout the U.S. Some questions in the survey pertain specifically to firms with wholesale sales and other questions to firms with retail sales. Information collected in this survey will be invaluable to researchers, educators, and allied professionals, as well as owners and managers in the Green industry. Much of this information is not available from any other source. To see examples of the results provided by this project, please visit our website at https://sites.google.com/site/greenindustryresearch/resources/.

It is important that you respond to this survey so that your type of business is represented in the study. Of course, your participation is voluntary, and you do not have to answer any questions that you do not wish to. All information provided is ***anonymous and strictly confidential***, and results will only be disclosed in summary form. Unfortunately, we cannot provide any compensation for your participation, however, your time in this matter is gratefully appreciated.

When you have completed the questionnaire, please return it in the postage-paid envelope provided.

If you have questions or concerns about your role as a research participant you may contact the University of Florida Institutional Review Board at 352-392-0433. For questions about the survey, please contact one of the principal investigators:

Dr. Alan W. Hodges, University of Florida, 352-294-7674, awhodges@ufl.edu
Dr. Hayk Khachatryan, University of Florida, 407-410-6951, hayk@ufl.edu
Dr. Charlie Hall, Texas A & M University, 979-458-3277, c-hall@tamu.edu
Dr. Marco Palma, Texas A & M University, 979-845-5284, mapalma@tamu.edu

Thank you very much for your cooperation!

General Company Information

1. In what **state** is your business primarily located?
   (may use two letter abbreviation)

2. What is the **ZIP code** for this location? _____

3. Does your business **operate a related business in another state**?
   ___Yes ___No
   If yes, please list the state(s):

4. What **year** was your firm established?

5. Which of the following business activities was your firm involved in during 2018? (check any that apply)

____Nursery/greenhouse grower

____Retail nursery/garden center

____Landscaping services

____None of the above

Employment

6. How many **employees** did your firm have in 2018?
_____ Permanent employees
_____ Temporary or seasonal employees (average number during peak season)
_____ Temporary workers through the H2A Program (included in above)

7. How has the **number of employees changed** over the last five years? (check which applies)

Permanent employees: ____Increased _____Stayed the same ____Decreased

Temporary employees: ____Increased _____Stayed the same ____Decreased

If employment has increased or decreased, indicate by what percent:

Permanent _____% Temporary _____%

8. Which of the following things are you doing to address labor shortages?
_____Adopting labor-saving technology

_____Paying higher wages

_____Training employees to improve skills

_____Adding employee benefits

_____Nothing

_____Other, please list examples _____

For firms with only landscape services, please skip to Question 33 (Factors Affecting Management and Planning), then continue to the end of the survey.

Product Types

9. What percentage of your sales in 2018 were for the following **plant types**? (answers should sum to 100%)

_____% Deciduous shade and flowering trees
_____% Deciduous shrubs
_____% Broad-leaved evergreen shrubs
_____% Narrow-leaved evergreen shrubs
_____% Evergreen trees
_____% Vines and grounds covers
_____% Roses
_____% Herbaceous perennials
_____% Bedding plants - flowering annuals
_____% Bedding plants - vegetables, fruits, and herbs
_____% Flowering potted plants
_____% Christmas trees (live or cut)
_____% Tree fruits
_____% Foliage
_____% Sod
_____% Propagated material (liners, cuttings, plugs, etc.)
_____% Other (list)

10. What percentage of your total plant sales in 2018 were **native plants,** i.e. plants present in your state before European settlement? _____%

11. What percentage of your plant sales in 2018 were in the following **product forms**? (answers should sum to 100%)

_____% Containerized
_____% Balled and burlapped
_____% Field grow bag
_____% Bare root
_____% Balled and potted / process balled
_____% In-ground containers (including pot-in-pot)
_____% Other types: e.g. cut trees, budwood, scions, seeds, tissue cultured plantlets, unrooted cuttings (circle other types listed here or specify as follows)

Production and Management Practices

12. Which of the following **Integrated Pest Management (IPM) practices** did your company follow in 2018? (check any that apply)

_____ Remove infested plants or plant parts
_____ Alternate pesticides to avoid chemical resistance
_____ Elevate or space plants for air circulation
_____ Use cultivation, hand weeding
_____ Disinfect benches/ground cover
_____ Use sanitized water foot baths
_____ Soil solarization/sterilization
_____ Monitor pest populations with tarp or sticky boards
_____ Adjust pesticide application to protect beneficials
_____ Use mulches to suppress weeds
_____ Beneficial insect identification
_____ Inspect incoming stock
_____ Manage irrigation to reduce pests
_____ Spot treatment with pesticides
_____ Ventilate greenhouses
_____ Use of beneficial insects
_____ Keep pest activity records
_____ Adjust fertilization rates
_____ Use screening/barriers to exclude pests
_____ Use biopesticides/lower toxicity
_____ Treat retention pond water
_____ Use pest resistant varieties

13. What percentage of your irrigation water last year was obtained from the following source(s)? (answers should sum to 100%)

    _____% Natural surface _____% Recaptured _____% Reclaimed
    _____% City (potable) _____% Well

14. What percentage of your irrigation water was applied by the following methods? (answers should sum to 100%)

    _____% Overhead _____% Drip irrigation
    _____% Subirrigation (ebb/flood) _____% Other types (list)

15. How has your **irrigation water use** on a per acre basis changed over the past five years? (check answer that applies)

    _____Increased _____Decreased _____Remained the same

    If irrigation water use has increased or decreased, indicate by what percent? _____%

16. Are you utilizing any "smart" irrigation systems, i.e. systems that monitor crop water needs and apply only the amount of water needed? ____Yes ____No

Marketing Practices

17. Did your firm use any social media for your business last year? ___Yes ___No
    If yes, please indicate what type:

    _____ Facebook _____ Pinterest _____ Twitter
    _____ YouTube _____ Instagram _____ Yelp
    _____ LinkedIn _____ Reddit _____ Houzz
    _____ Other, please specify _____

18. From what sources do you receive technical, business and marketing information? (check any that apply)

    _____ Sales or technical representatives
    _____Peer groups
    _____ In-person educational seminars and workshops
    _____ Print media (e.g., catalogs, newsletters)
    _____ Online/electronic sources (e.g., blogs, websites, podcasts, webinars)
    _____ Social media (Facebook, Twitter, Reddit, Instagram, etc.)
    _____ Other sources, list examples: _____

19. What percentage of total sales did your firm spend on **advertising** last year?

    _____%

20. What percentage of your **advertising budget** was spent on the following media forms in 2018? (answers should sum to 100%)

    _____% Websites _____% Newspapers
    _____% Radio / TV _____% Billboards
    _____% Gardening publications _____% Catalogs (print or CD)
    _____% Trade journals _____% Newsletters
    _____% Trade shows _____% Social media
    _____% Other (specify)

21. What percentage of your wholesale sales in 2018 were to the following type(s) of **market outlets**? (answers should sum to 100%)

    _____% Mass merchandisers (general merchandise stores, etc.)

_____% Home Centers (home improvement, building supply, hardware, etc.)

_____% Single location garden centers

_____% Multiple location garden centers (chain stores)

_____% Landscape firms (in-house or external)

_____% Re-wholesalers (brokers, other growers, etc.)

_____% Direct-to-consumer (online or in-person)

22. What percentage of your sales in 2018 were made using the following **sales methods**? (answers should sum to 100%)

    _____% Trade shows _____% Telephone _____% In-person

    _____% Mail order _____% Automated online/website only

    _____% Email _____% Other

23. At how many **trade shows** was your firm represented last year, with or without an exhibit?

    _____With an exhibit _____Without an exhibit

24. What percentage of your sales in 2018 were to **repeat customers**? _____%

25. Do you publish discount (price) information for large-volume purchases?

    ____Yes ____No

26. What percentage of your wholesale sales in 2018 were **negotiated,** i.e. there was discussion over price, quality or other terms of sale? _____%

27. Did you **resell or broker** plants for other growers in 2018?

    _____Yes _____No

    If yes, what percent of your total sales did this account for? _____%

28. What percentage of your wholesale sales in 2018 were **pre-booked on contract**, i.e. sold or committed before being produced? _____%

29. If you grow on contract, which of the following types of buyers contracted for production with your firm in 2018? (check any that apply)

    ____ Other growers ____ Retail garden centers

    ____ Mass merchandisers ____ Cooperatives

    ____ Other (specify)

Regional Trade in Nursery Products

30. What were the top five **states or countries**, including your own state, that you **purchased from** in 2018 to obtain seedlings, liners, whips, grafted material, tissue culture plantlets, cuttings, or plugs, and the percentage of total purchases represented by each?

	State or Country	
1)	_____	_____%
2)	_____	_____%
3)	_____	_____%
4)	_____	_____%
5)	_____	_____%

31. Did your firm **export** nursery products out of the U.S. last year?

_____Yes _____No

If you exported, what percentage of total sales were for exports? _____%

List the most important countries you exported to: _____

_____

32. What were the top five **states or countries**, including your own state, that you **sold plant products to** in 2018 and what percentage of total sales each represented, including the home state of your principal location?

	State or Country	
1)	Home state	_____%
2)		_____%
3)		_____%
4)		_____%
5)		_____%

Factors Affecting Management and Planning

33. Rate each of the following **factors affecting the geographic range of your market area**, using a scale of 1 to 4, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4

Debt capital
Equity capital
Marketing
Personnel
Production
Transportation
Plant offerings

34. Rate the importance of each of the following **factors for determining prices for your products**, using a scale of 1 to 4, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4
Cost of production				
Inflation				
Other growers' prices				
Grade of plants				
Market demand				
Product uniqueness				
Inventory levels				
Last year's price				
Other				

Please specify other factor _____

35. Rate each of the following **factors impacting your business**, using a scale of 1 to 4 scale, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4
Weather uncertainty				
Land				
Market demand				
Labor costs				
Water supply				
Debt capital				
Equity capital				
Own managerial expertise				
Competition / Price undercutting				
Environmental regulations				
Other government regulations				
Ability to hire competent management				
Ability to hire competent hourly				
Balance of power with suppliers / vendors				
Balance of power with buyers / customers				

Annual Sales

36. What was the **gross value of sales** by your business in 2018 or the most recent completed fiscal year?

Enter specific value here: $

Alternatively, check the appropriate range below:

_____ Less than $249,999	_____ $250,000 to $499,999
_____ $500,000 to $999,999	_____ $1,000,000 to $1,999,999
_____ $2,000,000 to $2,999,999	_____ $3,000,000 to $3,999,999
_____ $4,000,000 to $4,999,999	_____ $5,000,000 to $9,999,999
_____ $10,000,000 to $14,999,999	_____ $15,000,000 to $19,999,999
_____ $20,000,000 to $29,999,999	_____ $30,000,000 to $39,999,999
_____ $40,000,000 to $49,999,999	_____ $50,000,000 or more
_____ Don't know	

If your sales were $50,000,000 or more, please indicate the value rounded to the nearest million dollars:

_____million dollars

37. What percentage of your gross sales in 2018 were for the following horticultural industry activities? (answers should sum to 100%)

_____% Nursery/greenhouse production

_____% Retail nursery/garden center

_____% Landscaping services

_____% Other

Please write any comments you wish to share about your business in the spaces below.

_____

_____

_____

_____

_____

_____

_____

_____

Please return the completed questionnaire in the postage-paid envelope provided.

Thank you very much for your cooperation!

USDA Multistate Project S1065: Sustainable Practices, Economic Contributions, Consumer Behavior, and Labor Management in the U.S. Environmental Horticulture Industry

Prepared by: Hayk Khachatryan (hayk@ufl.edu), Alan Hodges (awhodges@ufl.edu), Charlie Hall (c-hall@tamu.edu), and Marco Palma (mapalma@tamu.edu)

Name of agency: Food and Resource Economics Department and Mid-Florida Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida