

Social Media Usage Among Green Industry Firms

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Abstract

Business social media usage in horticulture is largely unknown and unstudied. Because of this, the adoption and use of social media marketing in all industries, it is critical to understand how the green industry adopted and uses social media. Using a national survey of green industry firms conducted in 2019, this analysis explores how horticulture firms use social media. Results show that growers and retailers are much more likely to use social media and have multiple social media accounts than landscapers. Landscapers spend considerably less on total advertising and less on online and social media advertising compared to growers and retailers. Retailers spend the most advertising expenditures online and social media, but growers also spend on online and on social media. The firm's age does not seem to make a difference in advertising expenditures and usage, as the surveyed growers, retailers, and landscapers had been in business for a similar number of years. In fact, the firm's age was correlated with social media usage and the number of accounts. Firms in our sample ranked finding hourly employees as a greater concern across the board, but among hiring managers it was a rather low consideration. Results suggest that some of the social media behavior is correlated to factors deemed important for business success.

Index words: Business to consumer, green industry, in-store, marketing, online.

Significance to the Horticulture Industry

Since COVID-19, sales of horticultural products have increased (Behe et al. 2022). Some of this desire for plants has been attributed to social media exposure of more unique or rare plant options (Airhart 2019, Chapman 2019). Yet, little is known about the level of social media marketing that horticulture firms, whether grower, retailer or landscaper, are engaging in and on which platforms they utilize the most. Knowing how other firms are engaging with consumers can assist firms not on social media with knowing which platforms may be most suitable for themselves. Additionally, knowing how much on average the total industry spends in advertising expenditures, as well as online, social media, and website sales, can help firms set internal benchmarks as to how much they may wish to invest into marketing strategies.

Introduction

Social media encompasses online platforms frequently used by businesses to engage, sell, and inform their clientele. Social media platforms (e.g., Facebook, TikTok, LinkedIn, Twitter) provide product and service content and provide a location where conversations can occur between the business and customer groups where relationships,

online communities, reputations, and online identities are further developed (Diba et al. 2019). In 2022, 5.27 billion consumers were using social media, meaning a large portion of the market currently uses social media (Curry 2023).

Social media platforms provide many benefits in the business-to-consumer (B2C) and business-to-business (B2B) contexts. Social media provides customer groups with immediate access to pertinent information to aid in decision-making (Diba et al. 2019) and improves efficiencies in B2C sales through engaging customer groups, creating a two-way communication feedback loop (e.g., online reviews), improving customer service, and increasing information gathering efficiencies (Ahmed et al. 2019, Naslund et al. 2020). Similar benefits can be obtained in the B2B setting, including aiding in relationship building, content creation, communication, empowerment of employees, customer satisfaction, value creation, buying and sales intention, branding, knowledge exchange, new customer acquisitions, corporate credibility, and salesperson performance (see reviews by Cartwright et al. (2021) and Dwivedi et al. (2021)). Salespeople can also use social media to enhance value, cross/upselling, market knowledge, and reputation (Itani et al. 2022). Although the benefits of social media use are well documented, fewer studies address social media use by green industry firms, and previous studies have reported that the overall adoption of social media has been slow (Hall et al. 2020, Khachatryan et al. 2020, Rihn et al. 2021, Torres et al. 2021).

The adoption rate of social media by ornamental horticulture firms varies. Torres et al. (2017) and Rihn et al. (2021) found that landscape firms were the most likely to employ online and social media marketing relative to retailers or wholesalers. B2C retailers were also identified as heavy social media users (Rihn et al. 2021). Supporting evidence in a review by Dwivedi et al. (2021) states that several factors impact firms' social media adoption, including firm innovativeness, employee technical knowledge, stakeholder pressure, perceived usefulness, and perceived usability. Retailers and landscapers are more often in the B2C space, which may increase social media use. Other

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evidence suggests that small and medium-sized firms use a larger portion of their advertising expenditures on online sales channels which have a better return on investment for medium- to small-sized firms relative to larger firms (Palma et al. 2012). Yao et al. (2018) states that smaller firms gain more benefits through social media use. Torres et al. (2021) found that smaller firms invest a larger portion of their advertising budgets in online promotions if they participate in online advertising. However, they are less likely to participate initially.

In the green industry, social media use may be particularly interesting, given the high exposure to customer groups and low implementation costs (Yao et al. 2018). Additionally, due to pandemic restrictions, online sales of plants increased, and consumers were more comfortable buying plants online for curbside pick-up or at-home delivery (Campbell et al. 2021). In general, United States (U.S.) ornamental horticulture firms spend approximately 46 percent of their advertising budgets on online advertising (including social media; Torres et al. 2021); however, nearly 89 percent of U.S. ornamental horticulture firms used social media in 2017 (Peterson et al. 2018).

In general, several studies have addressed how consumers respond to online plant content. In garden centers, social media platforms and e-newsletters are used to build relationships and share educational content (Stebner et al. 2017). In Europe, social media and online content set trends and inform customers (Gabellini and Scaramuzzi 2022). Convenience, high-quality visuals, and educational content are key social media items for the green industry (Baker et al. 2020, Reyes and Navarra 2022). Together, the literature suggests that green industry firms could gain sales and market share by engaging customer groups through social media, but their adoption of social media use varies. Within this analysis, we present descriptive updated information about horticulture firms' social media usage to aid green industry stakeholders as they make strategic marketing and promotional decisions.

Materials and Methods

Data for this study derives from the Green Industry Research Consortium's National Green Industry Survey collected in 2018. Data collection, participant selection criteria, and distribution methodology are presented in Khachatryan et al. (2020). Each state in the contiguous U.S. was represented in the collection. Survey questions elicited information about the green industry firms (e.g., location, business activities), employment numbers, plant types produced, percent of total plant sales due to native plants, production, and management practices (e.g., integrated pest management (IPM) strategies, etc.), marketing practices and outlets, social media and information sources, regional trade information, and factors impacting business strategies. Data was collected using a mixed-mode approach, where online and mail survey formats were used to reach a broader sample of green industry firms (Dillman et al. 2005). The respective institutional review boards approved survey procedures and methods. A total of 2,094 complete survey responses were acquired.

Analysis. Data were cleaned and analyzed in Stata software (College Station, TX, USA) using the commands `sum` to collect the means and standard deviations per variable. The command `pwcorr` was utilized to look at pairwise correlations between where the firm gets information and factors that influence business practices.

Variables. Firm characteristics were measured, including: the region the firm is primarily located, the type of firm (i.e., wholesale, retail, landscape, other), annual sales, if the firm uses social media, and the number of social media platforms the firm uses. Table 1 displays the descriptions of the variables collected in the survey.

Variables related to social media collected include advertising expenditures (as % of total sales), advertising expenditures spent on online sources such as social media and websites, advertising expenditures only on social media platforms, and if the business uses online sources as information sources. Variables related to business characteristics include the type of business the firm is self-reported as (grower, retail, or landscaper), the years of business operation, their labor pool size and if it has changed compared to the year prior to the survey, the firm's perception of marketing (importance), and factors that affect business success, including managerial experience to regulation to abilities of staff and employees and power of suppliers and buyers in the marketplace. As seen in Figure 1, 43% of the sample labeled themselves as only growers, 8.5% as only retailers, and 15.8% as only landscapers. Some firms labeled themselves as both growers and retailers (15.3%), retailers and landscapers (2.7%), or landscapers and growers (5.2%), while 5.7% of firms self-reported all three business types.

Results and Discussion

Social media usage. Thirty percent (s.d. = 0.47) of the responding firms used social media (Table 2). When split among the types of firms, 35% of growers, 62% of retailers, and 22% of landscapers responding to the survey used social media. The average number of social media accounts a firm had was 0.56 (s.d. = 1.06). Realistically, most firms had no social media accounts, as shown in Figure 2. Within the sample, Facebook (29%), YouTube (3%), and Instagram (9%) were the most common social media platforms for firms. Advertising expenditures averaged at 2.77% of total sales for the firms (Fig. 3). Advertising expenditures fluctuated slightly per firm type: 3.14% for growers, 4.31% for retailers, and 1.94% for landscapers. The standard deviation within each variable is large, or sometimes larger, than the mean. This indicates that the data is dispersed (variance is large) from the mean and does not follow a normalized distribution. Having non-normal data is common within social survey data. Having a large variance means that the data is less reliable than if the standard deviation was smaller.

Table 2 illustrates that approximately 16% of advertising expenditures were spent online across all firms, as percentage of total sales. As seen in Figure 4, the overall percent of online expenditures ranged greatly with a bimodal effect of many firms reporting 0% percent, with another spike at 100 percent. Advertising expenditures

Table 1. Description of variables collected in survey of green industry firms used in analyses.

Variable	Description
Type of business	
grower	1 if business self-reported as nursery or greenhouse producer
retailer	1 if business self-reported as retailer
landscaper	1 if business self-reported as landscaper
Social media	
useSM	1 if business uses social media platforms
noSM	number of social media platforms, including Facebook, Pinterest, Twitter, YouTube, Instagram, Yep, LinkedIn, Reddit, Houzz, or other (0 – 10)
advexp	advertising expenditures as percentage of total sales (USD)
advexponline	advertising expenditures in social media and websites as percentage of total advertising expenditures sales (USD)
advexpSM	advertising expenditures in social media platforms as percentage of total advertising expenditures sales (USD)
Business characteristics	
productship	1 if respondent sells container-grown and/or ball/potted
annualsales	USD value of reported firm annual sales in 2019
onlinesales	percentage of sales through websites or emails
websales	percentage of sales through websites
pwholesale	percentage of sales through wholesale channels, does not include DTC
pDTC	percentage of sales through direct-to-consumer channels
yearbiz	number of years in operation in 2019
labor	number of full-time and part-time employees
lesslabor	1 if business experienced a negative change in the number of employees in 2019, relative to 2018
mktggeo	1 if business perceived marketing as an important or very important barrier affecting the geographic range
Information sources	
Sales or technical representatives	1 if business receives information from sales or technical representatives
Peer groups	1 if business receives information from peer groups
In-person educational seminars and workshops	1 if business receives information from in-person educational seminars or workshops
Print media	1 if business receives information from print media
Online/electronic sources	1 if business receives information from online or electronic sources
Social media	1 if business receives information from social media
Other sources	1 if business receives information from sources other than options listed
Region	
appalachian	1 if respondent is located in the Appalachian region of the United States
greatplain	1 if respondent is located in the Great Plains region of the United States
midwest	1 if respondent is located in the Midwest region of the United States
mountain	1 if respondent is located in the Mountain region of the United States
northeast	1 if respondent is located in the Northeast region of the United States
pacific	1 if respondent is located in the Pacific region of the United States
southcentral	1 if respondent is located in the Southcentral region of the United States
southeast	1 if respondent is located in the Southeast region of the United States
Factors impacting business success	
Own managerial expertise	not important=1, minor importance=2, important=3, very important=4
Competition/price undercutting	not important=1, minor importance=2, important=3, very important=4
Environmental regulations	not important=1, minor importance=2, important=3, very important=4
Ability to hire competent management	not important=1, minor importance=2, important=3, very important=4
Ability to hire competent hourly employees	not important=1, minor importance=2, important=3, very important=4
Balance of power suppliers/vendors	not important=1, minor importance=2, important=3, very important=4
Balance of power buyers/customers	not important=1, minor importance=2, important=3, very important=4

were larger for retailers, who spent 24%, and growers who spent 19%, but less for landscapers, who spent 9%. Approximately 7% of advertising expenditures for the total sample were spent on social media platforms and marketing. As with online advertising, retailers and growers spent more on social media advertising (11% and 8%) but landscapers spent less (4%). Forty-two percent of firms got educational information from, or use, online resources.

Business characteristics. Fifty-nine percent (s.d. = 0.49) of firms sold container-grown and/or ball/potted product types (Table 3). The importance of these types of product forms is their packaging flexibility to be shipped to customers. Unsurprisingly, 79% of retailers and 72% of

growers sold container-grown and/or ball/potted product types. Yet only 38% of landscapers sold container-grown and/or ball/potted products. The average annual sales in 2019 was \$1,113,660 across firms, with growers reporting \$1,055,146 in annual sales, retailers reporting \$624,932 in annual sales, and landscapers reporting an average of \$1,339,277. To note, the standard deviation of each variable was as large as, or sometimes larger, than the variable mean. The data should be interpreted with caution as this indicates the data has large variance and is widely spread from the mean.

Businesses in our sample reported that 7% and 2% of total sales were online or from a website only, respectively (Table 3). Growers reported the most online and website

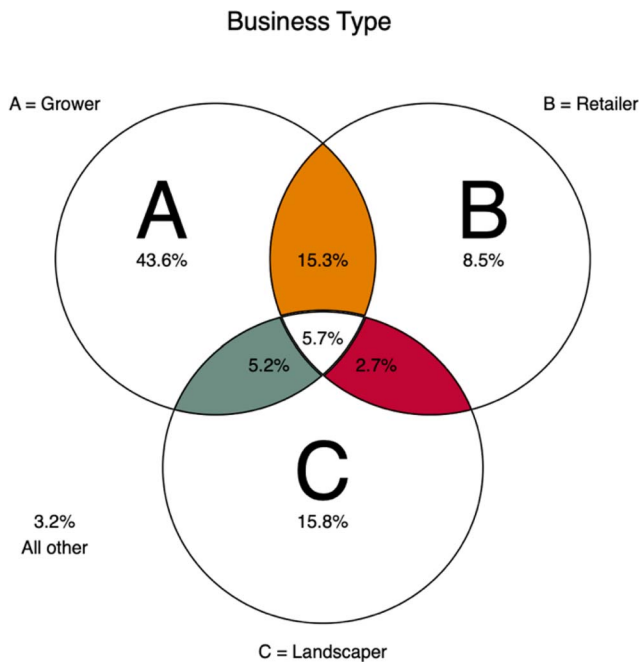


Fig. 1. Venn Diagram of percentages of type of firm (Grower, Retailer, or Landscaper) and multiple selections between Grower, Retailer, or Landscaper (colored inter-spaces).

sales at 9.6% and 3%, followed by retailers at 4.8% and 2.5%, and lastly, landscapers reported 2.4% and 1% of their annual sales come from online and website sales, respectively. The annual sales through wholesale channels were 32% across firms, with 44% of wholesale sales occurring for growers, 26% for retailers, and 16% for landscapers. As discussed, a newly emerging area of market channels, direct-to-consumer (DTC), had roughly 21% of total sales. Growers had the largest percentage of sales deriving from DTC at 28%, followed closely by retailers at 27% and landscapers at 12%.

On average, firms had been in business for 26 years (Table 3). This was fairly consistent across groups, with growers being in business for an average of 27 years, retailers for an average of 28 years, and landscapers for an average of 25 years. Firms averaged approximately 16 employees. This fluctuated slightly from growers at an average of 15 employees to retailers with an average of 13

employees to landscapers with an average of 21 employees. Retailers experienced the most negative change in labor from the previous year, with 10% of the firms reporting fewer employees than the previous year. Growers experienced the least labor change, with 8% experiencing negative employment trends compared to the previous year.

Approximately 25% of firms said marketing was important for their business success (Table 3). Retailers reported the greatest number of firms who agreed with the statement at 35%. Interestingly, landscapers spent the least on online advertising expenditures and wholesale channels, and yet, 30% of landscapers reported that marketing was important to their business success. Most of the firms participating in the survey were from the Southeast region of the United States (27%), followed by the Midwest (21%), Northeast (15%), Pacific (12%), Appalachian (10%), South-central (8%), Mountain (4%), and Great Plains (2%).

The most common way that firms got information was from print media (42 percent) and online/electronic sources (37%) (Table 4). Growers and retailers had used print media and online resources at large percentages (52 and 53% for print media; 46 and 47% for online sources, respectively). Overall, fewer landscapers than growers and retailers used written resources for information gathering; only 26% used print media and 23% used online sources. Thirty percent of firms used sales or technical representatives, 29% used peer groups, and 28% used in-person educational seminars or workshops. Similar percentages of retailers and growers used these sources, with approximately 37% using sales or technical representatives, 37 and 28%, respectively, using peer groups, and 30-35% using in-person workshops. Regarding social media as an information resource across firms, approximately 16% used social media for this purpose. However, when delving into firm types, 27% of retailers, 19% of growers, and 10% of landscapers used social media as an information source.

All the factors impacting business ranged between 2 (mildly important) to 3 (important) (Table 4). On a scale of 1 (not important) to 4 (very important), firms averaged their managerial expertise as 2.64 out of 4.00. Growers reported the lowest importance value at 2.59, while landscapers reported the highest at 2.76. The next most

Table 2. Mean and standard deviation (S.D.) of growers, retailers, and landscapers by their social media usage, number of social media accounts, advertising expenditures, online expenditures, and social media advertising expenditures.

Variable	Full Sample		Grower		Retailer		Landscaper	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Proportion of firm use social media (useSM)	0.32	0.47	0.35	0.48	0.62	0.49	0.22	0.42
Number of social media accounts (nSM)	0.56	1.06	0.62	1.10	1.11	1.28	0.38	0.89
% of total sales that consist of advertising expenditures (advexp)	2.77	7.00	3.14	7.46	4.31	8.20	1.94	5.57
% of advertising expenditures online (advexponline)	15.99	32.53	18.79	34.51	23.52	36.45	8.99	24.21
% of advertising expenditures social media (advexpSM)	6.85	21.39	7.84	22.83	11.39	25.63	3.59	14.79
Proportion of sample that uses Facebook	0.29	0.45	0.32	0.47	0.59	0.49	0.21	0.40
Proportion of sample that uses Pinterest	0.03	0.16	0.03	0.17	0.05	0.22	0.01	0.12
Proportion of sample that uses Twitter	0.04	0.19	0.04	0.20	0.07	0.26	0.02	0.14
Proportion of sample that uses YouTube	0.03	0.16	0.03	0.17	0.05	0.22	0.01	0.11
Proportion of sample that uses Instagram	0.09	0.29	0.10	0.31	0.18	0.39	0.07	0.26
Proportion of sample that uses Yelp	0.02	0.14	0.02	0.13	0.05	0.21	0.01	0.11
Proportion of sample that uses LinkedIn	0.03	0.16	0.03	0.18	0.03	0.18	0.01	0.13

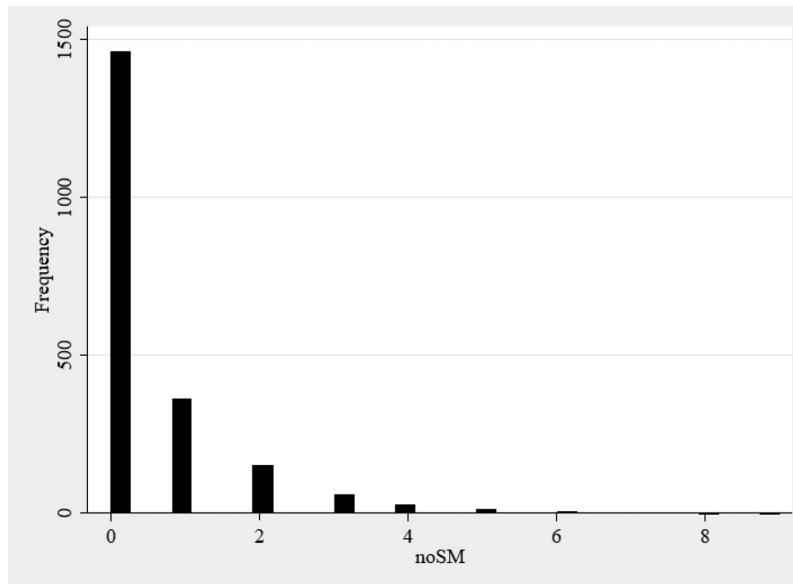


Fig. 2. The number of social media accounts in all firms in our sample (0-10 accounts).

important factor was the ability to hire competent hourly workers at 2.52 overall, 2.40 for growers, 2.48 for retailers, and 2.94 for landscapers. Competitive/price undercutting was the next factor at 2.39 overall, 2.39 for growers, 2.38 for retailers, and 2.41 for landscapers. Balance of power with buyers/customers ranked 2.30 out of 4.00 overall, with 2.26 for growers, 2.22 for retailers, and 2.41 for landscapers. Other governmental regulations (outside environmental) ranked next at 2.20 overall, 2.18 for growers, 2.12 for retailers, and 2.27 for landscapers. Environmental regulations were considered slightly above mildly important at 2.17 out of 4.00 overall, 2.15 for growers, 2.07 for retailers, and 2.26 for landscapers. The ability to hire competent management was the second lowest-ranked factor impacting business at 2.09 overall, 1.97 for growers, 2.08 for retailers, and 2.48 for landscapers. Lastly, the balance of power with suppliers and vendors was the lowest ranked factor affecting business

at 2.02 overall, 1.97 for growers, 2.05 for retailers, and 2.13 for landscapers.

Table 5 illustrates the correlations between social media practices that firms participate in, business characteristics, and overall scored factors impacting business success. All factors that have an asterisk are significant at the 5% level. The use of social media was highly correlated with the number of social media accounts the firm had ($R=0.78$). The use of social media had a positive weak relationship with advertising expenditures ($R=0.17$), as well as the percentage of online advertising expenditures and social media advertising expenditures ($R=0.31$ and 0.28). Using social media was also correlated with using online sources for information ($R=0.36$). The more years the firm had existed, the more likely they are to use social media ($R=0.09$). Online and web sales are weakly correlated with the use of social media ($R=0.11$ and 0.07). The

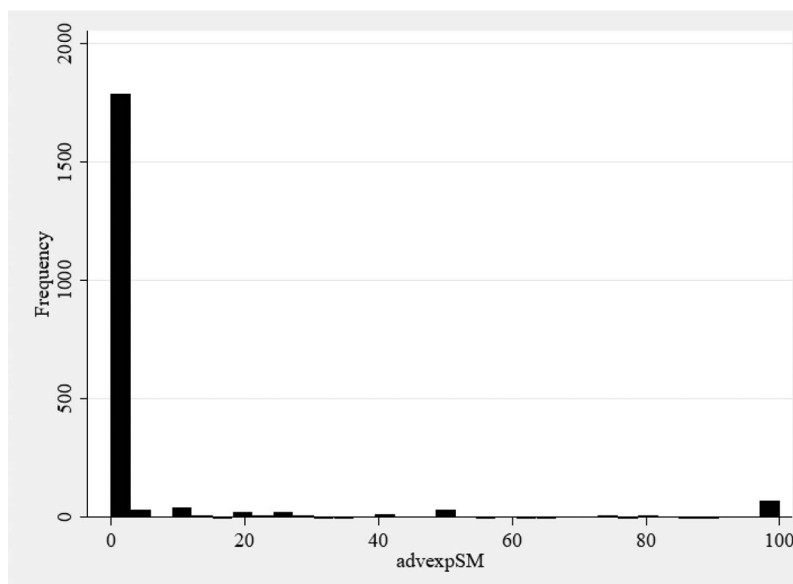


Fig. 3. The percentage of advertising expenditures per firm spent on social media (0% = no advertising online, 100% = only advertising online).

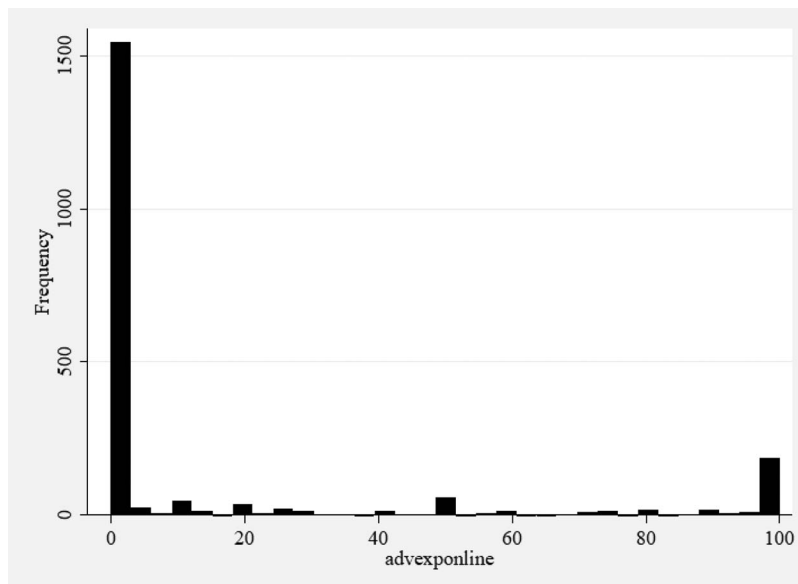


Fig. 4. The percentage of online advertising out of total advertising expenditures per firm (0% = no advertising online, 100% = only advertising online).

percent of sales that occur through wholesale channels ($R=0.06$) and the percent of sales that occur through DTC ($R=0.19$) are also positively, weakly correlated with the use of social media. Surprisingly, the balance of power with suppliers and vendors was weakly correlated with social media usage ($R=0.06$), but the balance of power with buyers and customers was not.

Expectedly, the number of social media accounts the firm had was positively correlated with advertising expenditures (18%), online advertising expenditures (33%), social media expenditures (29%), the use of online resources for information (36%), the number of years in business (12%), online and website sales (12% and 10%), percentage of sales done through wholesale channels (7%), and percentage of sales through DTC (14%) (Table 5). This means that as overall advertising increases, as well as advertising expenditures for online and social media specifically, the number of social media accounts will also increase, which may be a reflection of increasing businesses' adoption of social media and diffusion of online strategies. Also, as with the use of social media, as the number of years in business increases, so does the number of social media accounts that the firm had. For the factors that impact business success, the number of social media accounts was correlated with the ability to hire competent management (13%), hire competent hourly workers (11%), and the balance of power with suppliers and vendors.

Advertising expenditures are positively correlated with the amount of advertising expenditures online (21%) and on social media (19%) (Table 5). This result suggests that the more advertising expenditures a firm had, the more likely they use online information sources for information (21%). There was a weak correlation with the percent of annual sales from the firm's website (5%), but there was no effect on the years in business, online expenditures, or the percentage of sales that occur in wholesale channels. Table 5 shows a 13% correlation between advertising expenditures and the percentage of annual sales DTC.

Unlike the use of social media, advertising expenditures were positively correlated with the business factor competition/price undercutting (9%), indicating they might participate in more advertising to counteract competition. Advertising expenditures are positively correlated with the balance of power with buyers/customers (7%), though this correlation was weak.

Online advertising expenditures were highly correlated with social media advertising expenditures (67%) and using information sources online (34%) (Table 5). Online advertising expenditures were negatively correlated with the number of years in business. Therefore, the longer a firm is in business, the less likely they are to do online advertising (-4%). Online sales (17%) and web sales (15%) were correlated with online advertising expenditures, suggesting that online advertising is complementary to selling online. The percentage of sales at wholesale channels and DTC outlets were also correlated with online advertising expenditures (8% and 18%, respectively). Online advertising expenditures negatively correlated with the firm's scored importance for environmental and governmental regulations (-6% and -5%) (Table 5). It seems that as the industry's concern for regulation goes up, the percentage of online advertising expenditures goes down.

Advertising expenditures on social media positively correlate with using online information sources (25%) (Table 5). Similar to online advertising expenditures, the number of years in business was negatively correlated to social media advertising (-7%). This means that the older a firm is, the less likely the firm is to advertise on social media. The percentage of social media advertising expenditures was correlated with online sales and web sales, though these are small correlations (4% and 5%). The percentage of sales from wholesale channels was not correlated with the percentage of social media advertising expenditures but was correlated with the percentage of sales from DTC channels (14%). As with online advertising expenditures, the importance of environmental regulations and other

Table 3. Mean and standard deviation of growers, retailers, and landscapers by if they produce container-grown or balled/potted crops, annual sales, where their sales derive from, years in business, number of employees (labor), whether marketing was important barrier or not to the business, and regional location of the business.

Variable	Full Sample		Grower		Retailer		Landscaper	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Sells container-grown and/or ball/potted (productship)	0.59	0.49	0.72	0.45	0.79	0.41	0.38	0.48
Reported annual sales (annualsales)	1,113,660.00	6,799,113.00	1,055,146.00	4,389,255.00	624,932.00	2,637,804.00	1,339,277.00	10,400,000.00
Percent of annual sales derived from online platforms (onlinesales)	7.00	19.38	9.60	22.20	4.87	16.58	2.39	10.96
Percent of annual sales derived from website (pwebsales)	2.49	11.63	3.09	13.73	2.50	11.21	1.15	5.21
Percent of sales derived from wholesale channels (pwholesale)	32.04	44.34	43.72	46.59	25.96	40.32	16.15	34.40
Percent of sales derived from direct-to-consumer (pdTC)	21.42	38.49	27.73	41.56	26.71	40.93	11.89	29.69
Number of years in business (yearbiz)	25.80	22.09	26.55	22.34	28.34	25.38	24.65	20.83
Number of full or part-time employees (labor)	16.42	87.51	14.70	48.26	12.57	35.25	20.50	141.17
Proportion of firms having decrease in labor (lesslabor)	0.08	0.28	0.08	0.28	0.10	0.30	0.09	0.28
Proportion of firms that believe marketing as an important or very important barrier affecting the geographic range (mktggeo)	0.29	0.45	0.29	0.46	0.35	0.48	0.30	0.46
Proportion of firms located in Appalachia (Appalachian)	0.10	0.30	0.11	0.32	0.11	0.31	0.08	0.27
Proportion of firms located in Great Plains (greatplain)	0.02	0.14	0.01	0.12	0.04	0.19	0.04	0.19
Proportion of firms located in Midwest (midwest)	0.21	0.41	0.15	0.36	0.22	0.41	0.34	0.48
Proportion of firms located in Mountain (mountain)	0.04	0.20	0.03	0.17	0.04	0.20	0.07	0.25
Proportion of firms located in Northeast (northeast)	0.15	0.36	0.18	0.39	0.19	0.40	0.10	0.30
Proportion of firms located in Pacific (pacific)	0.12	0.32	0.15	0.35	0.11	0.31	0.05	0.21
Proportion of firms located in Southeast (southeast)	0.08	0.27	0.07	0.26	0.08	0.28	0.10	0.30
Proportion of firms located in Southeast (southeast)	0.27	0.45	0.29	0.45	0.21	0.41	0.23	0.42

governmental regulations were negatively correlated with the percentage of social media advertising expenditures (-5% and -5%). Interestingly, the importance of hiring competent hourly employees was negatively correlated with the percentage of social media advertising expenditures (-5%). While this correlation is small, it suggests that the greater the importance of hiring competent hourly workers, the less likely the firm is the use advertising expenditures for social media.

The percentage of firms that get their educational information from online sources was not correlated to years of business. It was correlated to the amount of online and website sales (20% and 13%) as well as the percentage of sales that derives from wholesale channels and DTC channels (18% and 21%). None of the factors that impact business had a corollary effect on the percentage of firms that get their educational information from online sources, except for the importance businesses place on environmental regulations (-5%). Though this is a small correlation, the greater the importance the business places on environmental regulations, the less likely they are to use online information sources.

Online marketing is becoming an increasingly important strategy to engage, sell, and build customer relationships. Online marketing includes the use of social media platforms (e.g., Facebook, Instagram, TikTok, Twitter, LinkedIn, etc.), and it is commonly combined with other online strategies such as online sales (i.e., e-commerce) and online market research (i.e., market intelligence). The importance of investigating the use of online strategies, including investment in online and social media marketing, lies in the ability of businesses to reach new customers and engage with current ones to build long-term relationships. While the popularity of online tools continues to grow, industries like the green industry seem to be slower in adopting these strategies (Torres et al. 2021, Rihn et al. 2021). Even though the empirical evidence suggests that investing in online marketing has positive returns to investment, especially among smaller firms in the green industry (Yao et al. 2018), many firms remain unwilling or unable to adopt these cost-efficient strategies. This study investigates the adoption rate of online strategies, including online advertising and social media advertising expenditures. We characterized green industry firms by business type, respectively, (growers, retailers, and landscapers) and profiled their adoption of online strategies and how business characteristics are associated with this adoption.

Several differences were observed related to the adoption of online marketing strategies across business types. Landscapers report on average higher annual sales, but they spent considerably less on total advertising and less on online and social media advertising when compared to their counterparts. Unsurprisingly, retailers spent the most advertising budget on online and social media marketing, but growers also reported spending a good amount on these online strategies. One explanation may be that businesses using market channels that reach customers directly can greatly benefit from reaching a broader audience and building business-customer relationships. We expect that increasing online sales of plants may be encouraging

Table 4. Mean and standard deviation of growers, retailers, and landscapers by where they get information (sources) and their perceptions of market and managerial practices that affect their business success.

Variable	Full Sample		Grower		Retailer		Landscaper	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Information sources								
Sales or technical representatives	0.30	0.46	0.37	0.48	0.37	0.48	0.19	0.40
Peer groups	0.29	0.45	0.37	0.48	0.28	0.45	0.15	0.36
In-person educational seminars and workshops	0.28	0.45	0.35	0.48	0.30	0.46	0.18	0.38
Print media	0.42	0.49	0.52	0.50	0.53	0.50	0.26	0.44
Online/electronic sources	0.37	0.48	0.46	0.50	0.47	0.50	0.23	0.42
Social media	0.16	0.37	0.19	0.39	0.27	0.44	0.10	0.31
Other sources	0.06	0.23	0.07	0.25	0.05	0.22	0.04	0.20
Factors impacting business success								
Own managerial expertise	2.64	1.13	2.59	1.13	2.65	1.10	2.76	1.08
Ability to hire competent hourly employees	2.52	1.24	2.40	1.23	2.48	1.24	2.94	1.18
Competition/price undercutting	2.39	1.05	2.39	1.03	2.38	1.04	2.41	1.06
Balance of power buyers/customers	2.30	1.05	2.26	1.05	2.22	1.06	2.41	1.02
Other government regulations	2.20	1.09	2.18	1.09	2.12	1.05	2.27	1.09
Environmental regulations	2.17	1.07	2.15	1.07	2.07	1.04	2.26	1.07
Ability to hire competent management	2.09	1.19	1.97	1.15	2.08	1.18	2.48	1.23
Balance of power suppliers/vendors	2.02	1.00	1.97	0.99	2.05	1.02	2.13	0.99

farmers to diversify market channels and sell directly to consumers, using online marketing as a major instrument to reach consumers. Online marketing strategies can help firms cast a wider net of customer groups, including those in other geographic zones or outside the typical customer groups businesses can reach from word-of-mouth or traditional marketing.

The fact that adopting social media platforms (useSM) was positively associated with the number of platforms used (nSM) provides early evidence of the domino effect of the adoption of online marketing. These results suggest that adoption (i.e., using social media marketing) and diffusion (i.e., the spread of social media marketing) of social media marketing go hand in hand in the green industry. Based on the findings, there are several relevant implications for the green industry. First, we expect that once businesses incorporate online marketing as their go-to marketing strategy, social media is likely to change how

they conduct business by increasing the online marketing budget, reaching a wider clientele, and increasing the likelihood of selling online. To be successful in their social marketing efforts, firms should prioritize finding competent hourly workers as it is considered a higher concern for their business success. This implies that having a capable and knowledgeable staff is essential for developing quality content and maintaining high-impact social marketing campaigns. Our results showed that the firm's age is not a significant factor in social media usage, indicating that even established growers can benefit from incorporating social media into their marketing strategies.

Our results also suggest evidence of social media listening (i.e., using information from social media sources) and its impact on the adoption and diffusion of online marketing strategies. Social media listening is defined as the monitoring of social media platforms to track industry and market trends, build brand awareness, and monitor

Table 5. Correlation between market and managerial practices and location where the firm's sales derive from.

	useSM	nSM	advexp	advexponline	advexpSM	onlineinfo
useSM	1					
nSM	0.7796*	1				
advexp	0.1711*	0.1797*	1			
advexponline	0.3114*	0.3287*	0.2177*	1		
advexpSM	0.2820*	0.2893*	0.1920*	0.6723*	1	
onlineinfo	0.3560*	0.3587*	0.2065*	0.3359*	0.2451*	1
yearbiz	0.0979*	0.1193*	-2.90E-02	-0.0496*	-0.0722*	0.0263
onlinesales	0.1134*	0.1209*	0.0368	0.1740*	0.0483*	0.2036*
websales	0.0720*	0.1031*	0.0511*	0.1465*	0.0503*	0.1378*
pwholesale	0.0629*	0.0700*	0.0302	0.0775*	0.0031	0.1849*
pDTC	0.1977*	0.1409*	0.1256*	0.1771*	0.1441*	0.2123*
Own managerial expertise	0.0088	0.0263	0.0121	0.0107	-0.0082	-0.0279
Competition/price undercutting	0.0067	0.0277	0.0902*	0.0376	0.0335	0.0158
Environmental regulations	-0.0432	-0.0263	0.0095	-0.0683*	-0.0523*	-0.0594*
Other government regulations	-0.0157	0.0089	0.0177	-0.0573*	-0.0539*	-0.0369
Ability to hire competent management	0.0431	0.1251*	-0.0066	-0.0299	-0.0393	-0.0231
Ability to hire competent hourly employees	0.0466	0.1070*	-0.0111	-0.0309	-0.0590*	-0.0292
Balance of power suppliers/vendors	0.0648*	0.0659*	0.0245	-0.0334	-0.0132	-0.0127
Balance of power buyers/customers	0.0161	0.0288	0.0684*	-0.0334	-0.0423	-0.005

competitors' strategies. Using online sources of information was positively correlated with using social media platforms, the number of social media platforms, online advertising expenditures, and social media advertising expenditures. Together, these results suggest that acquiring information from online sources is helping businesses understand their customer segments, respond to market trends, and make strategic decisions to increase profitability.

In conclusion, limitations of this study include the large variation from variable means that the data is less reliable than if the standard deviation was smaller. Based on the implications discussed above, it is evident that social media has become an essential tool for green industry firms, including plant retailers and plant grower firms, in reaching and engaging with customers. Our findings suggest that cooperative extension educators could play an important role in facilitating the adoption of social media use among green industry firms. They can provide valuable support by sharing successful examples of social media use and hosting hands-on workshops on effective consumer engagement strategies for social media platforms. For example, by showcasing how other businesses within the industry have effectively used social media platforms, extension educators can inspire (and guide) firms in developing their social media strategies. Real-life success stories can serve as powerful motivators and demonstrate the potential benefits and opportunities that social media presents. Further, connecting green industry professionals with peers through in-person and social networking can provide a support structure outside of formal or informal learning opportunities that expand the budget, thus reach of any given training program and broadly improve industry social media marketing efforts.

To further advance the field, future research may focus on a better understanding of the barriers that hinder green industry firms' adoption of social media. Identifying and addressing these barriers will enable firms to overcome challenges and fully leverage the increasingly high potential of social media in their marketing efforts. There is no doubt that social media will continue to be a driving force of communication not only between green industry firms but also between firms and their customers. By enabling more green industry businesses to succeed with social media, the green industry collectively can experience growth and thrive in an increasingly digital marketplace.

Another area that future research can focus on is evaluating the return on investment of social media efforts and developing performance measurement frameworks specifically tailored for green industry firms. Understanding the impact of social media activities on green industry firms' business outcomes, such as brand awareness, customer acquisition, and sales, can help green industry firms assess the effectiveness of their strategies and allocate resources more efficiently. Future research can explore methodologies and metrics for measuring the effectiveness of social media campaigns, such as tracking key performance indicators and identifying best practices for social media coordinators to optimize performance. Finally, future research could also focus on emerging technologies in the social media landscape by identifying and evaluating emerging

tools relevant to the green industry. For example, exploring the potential applications of technologies such as augmented reality or live streaming (e.g., demonstration of plants or plant care) can provide helpful insights to enhance consumer experiences, thus helping firms to differentiate themselves from competitor firms.

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