Growing the Next Generation of Horticulture Customers and Stakeholders through Industry and Extension Outreach Collaborations[1]

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Abstract

As the horticulture consumer base transitions to younger generations, educational outreach collaborations between Extension and industry could be a mutually beneficial way to serve an increasingly diverse customer audience. A recent study investigated drivers of, and opportunities for, increased participation in plant-related activities using an online survey of 2,134 respondents. Both participants and non-participants in plant-related activities were surveyed. Some of the commonly cited reasons for non-participation were a lack of knowledge and overall success, illustrating an opportunity for education to be beneficial. While many plant retailers may not have the personnel or resources to engage widely in education, collaborations with Extension could be a viable path to address knowledge limitations of their customers and increase engagement in horticulture.

Index words: gardening, millennial, Gen X, Gen Z, Baby boomer, horticulture education.

Significance to the Horticulture Industry

As generational change occurs in the horticulture customer base, younger and more diverse consumers are increasingly economically important. Understanding these new and potential customers will be essential for horticulture businesses. This study was conducted to survey participants and non-participants in plant-related activities to better understand what drives this participation and what the horticulture industry can do to increase participation. We found that knowledge and success were key challenges to participation. This study also found that education and practical hands-on engagement with plants can be a route to increase knowledge and expand the level of engagement with current gardeners as well as potentially lay the foundation to reach current non-participants. An added focus on educational efforts could place a strain on small and mid-scale horticulture growers and retailers already operating at capacity. So, we suggest that synergistic collaborations could be developed between Extension educators and local horticulture retailers.

Introduction

The potential role of outreach in the horticulture marketplace. In the horticulture marketplace in the United States, the long-predicted transition in gardening generations is taking place as what was the largest generation in U.S. history, the baby boomers, are no longer the key spending generation (Gardenresearch.com 2018, Whitinger and Cohen 2022). Because Millennials (1981-1996) and younger generations make up an increasing portion of the gardening audience, it is crucial for the industry to understand, engage, and retain these customers. Over the past few decades, the base consumer model for horticulture was focused on higher income homeowners, who were often middle aged or older women in the Baby Boomer (born before 1965) generation (Behe and Dennis 2009, Behe Huddleston and Sage 2016, Gardencentermag.com 2016, Zhao et al. 2016). Horticulture consumers now have fewer defining characteristics as participation includes younger customers across the genders with an increasing level of educational attainment and who may be still at home or renting housing (McGinnis et al. 2020, Whitinger and Cohen 2022). It is encouraging that the plant audience is broadening as these trends present excellent opportunities to expand the consumer base. However, the expectations placed on horticulture businesses by these more diverse consumers are not always simple to understand or meet. The overall objective of this study is to better understand the new horticulture consumer and their needs.

Understanding consumer demographics as well as preferences for standard plant attributes such as price, convenience, service, and quality has long been a staple of horticulture marketing research (Behe et al. 2008, Knuth et al., 2021, Mason et al. 2008, Yue and Behe 2008). However, changing demographics of consumers are linked with new trends that are much more connected with consumer knowledge and understanding of environmental and human connections, such as pollinator health, worker impact, and the social or psychological benefits of plants (Behe et al. 2022, Campbell and Campbell 2019 Knuth 2022 Whitinger and Cohen 2022). Additionally, the COVID-19 pandemic accelerated interest and purchasing of plants and plant products across the demographic range of consumers and may have changed expectations of the industry (San Fratello et al. 2022). An estimated 18 million new participants took part in plant and garden-related activities during the pandemic, with many of these new customers representing younger generations, families with children, and non-Caucasians (Whitinger and Cohen 2021, 2022).

Younger and less experienced customers entering the plant marketplace in large numbers present an exciting opportunity to connect with these new audiences to build a stable customer

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base for the future. However, the size and the demographic differences in these new audiences as well as their technology use (e.g., internet, smart phones, etc.) mean that green industry businesses cannot assume gardening and plant preferences will be similar to plant customers of years past. Indications are that newer consumers are different in terms of how they self-identify, their motivations, and their interactions with information sources (McGinnis et al. 2020). The expectations for the plant marketplace of these newer consumers can go well beyond high-quality plants to include engaging information and enjoyable experiences as well as an expectation of improving their success in plant endeavors (McGinnis et al. 2020). Adding to this challenge, some survey efforts conducted to assess the impact of younger buyers recently entering the market suggest not all of the new consumers plan to stay engaged with plants (San Fratello et al. 2022). It will be very important for green industry growers and retailers to quickly understand and begin meeting the needs of these new audiences to retain them as customers moving forward.

One challenge is that many small to mid-size growers and retailers are not able to simultaneously grow high-quality products, market them, and conduct consumer research and educational endeavors. Therefore, if knowledge is a key need for new consumers, land-grant researchers and Extension educators may be able to partner with industry stakeholders to assist in tailoring education and marketing in the horticultural arena to aid in engaging and retaining these new audiences. Green Industry businesses have strong land-grant connections due to collaborations and use of production research. While production research will remain crucial for industry success, Extension outreach collaborations also offer a potential benefit to green industry businesses through consumer education focused on meeting their needs, retaining new customers, and increasing demand for future plant and plant product purchases. Emerging consumer dynamics create challenges for businesses in meeting multi-faceted expectations but also opportunities for horticulture businesses and Extension to develop synergistic education and outreach materials and partnerships to reach these clients and customers. The objective of this study was to conduct a survey of both new and experienced gardeners and assess their interest in plants, plant engagement, and the challenges or limitations to their increased plant engagement. These consumer perspectives will be understood and addressed in the context of developing tools to assist green industry businesses in addressing challenges related to retaining new gardeners as loyal customers in the coming years.

Materials and Methods

To address the study objective, an online survey instrument was administered in September 2021 to U.S. consumers. Participants had to be 18 years old or older at the time of the study to participate. The survey was administered via a Qualtrics (Provo, UT) link using an online panelist database provided by Toluna, Inc (Norwalk, CT). Participants were selected based on parameters given to Toluna, Inc. such as race, age, and income. The sample aligned with the U.S. population demographics. A total of 2,134 people completed the survey. The survey contained several sections addressing self-reported plant involvement, plant information sources, barriers to gardening, gardening benefits, and participant socio-demographics. The survey and study procedures were approved by the University of Georgia Institutional Review Board (project number 00006287).

The survey instrument was tested for validity and reliability using a soft launch whereby less than 5% of the responses were initially captured. The results were used to ensure the cogency of the remaining survey data before they were collected. STATA (version 17 for Windows; StataCorp LLC, College Station, TX) was used to analyze responses through the generation of descriptive statistics, correlations, and pairwise t-tests.

For analysis, participants were grouped into "do not participate" (in gardening) and "participate" groups. To determine who participated and did not participate, participants were asked "Approximately how long have you been involved in growing plants or gardening activities?" They were provided five gardening activities, including: vegetable gardening, growing houseplants, landscaping, flower gardening, and other, and indicated participation in each activity using a 6-point scale. The scale answer options included "I do not participate", "Less than a year", "1-2 years", "3-5 years", "6-10 years", and "More than 10 years". People who selected "I do not participate" for all five activities were classified as "do not participate" where 1 indicates they do not participate in any of the activities and 0 indicates they do participate in at least one of the activities. A total of 466 participants (21.8% of the sample) did not participate in any of the gardening activities, whereas 78.2% of the sample participated in one or more gardening related activity (Table 1).

Results and Discussion

Survey participant overview. On average, the respondent was 43 years of age (Table 1), which is slightly higher than the national median age of 38.8 (US Census 2022), likely due to not sampling the 0-18 age group in this survey. The sample was 69% white and 55% female, which were both also slightly higher than the national average of 61% white and 50.5% female (US Census 2022) due to the fact that gardening surveys typically oversample female participants. The survey sample had an average household income of $70,197, which is similar to the national average household income of $69,717 (US Census 2022). Households averaged nearly 2 children and 2.5 adults with 32% living in rural areas, 23% in metro areas and 45% in suburban areas. The sample was distributed across the education levels with 28% having obtained a high school diploma or less, 29% some college, 22% a bachelor's degree, and 21% a graduate degree at the time of the study (Table 1). Regarding differences between gardeners and those who do not participate in plant related activities in this sample, the gardeners were generally younger with higher education levels, larger households, and higher incomes. They were ethnically diverse with gardeners representing a slightly higher percent of white individuals, a lower percent of black individuals, and higher percent of people who identify as "other" ethnicities. A larger portion of gardeners were located in rural areas.

Table 1. Summary demographic variables for the total sample of respondents to a national survey and by gardening participation of those respondents.

	Total (n=2,134)		Do not participate (n=466)		Participate (n=1,668)		
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**p-value[z]**
Age	43.016	17.952	50.895	19.413	40.815	16.883	<0.001
Silent generation (1928-1946)	0.052	0.223	0.107	0.310	0.037	0.189	<0.001
Baby Boomers (1946-1964)	0.227	0.419	0.369	0.483	0.187	0.390	<0.001
Gen X (1965-1980)	0.211	0.408	0.189	0.392	0.217	0.412	0.1875
Millennials (1981-1996)	0.346	0.476	0.215	0.411	0.382	0.486	<0.001
Gen Z (1997-2012)	0.164	0.371	0.120	0.326	0.176	0.381	0.004
Male	0.450	0.498	0.446	0.498	0.451	0.498	0.845
White	0.693	0.462	0.732	0.444	0.682	0.466	0.038
Black	0.149	0.356	0.101	0.301	0.162	0.369	0.001
Hispanic	0.068	0.253	0.052	0.221	0.073	0.260	0.102
Other race	0.090	0.286	0.116	0.320	0.083	0.276	0.027
Education- HS or less	0.278	0.448	0.337	0.473	0.261	0.440	0.001
Education- some college	0.292	0.455	0.339	0.474	0.279	0.449	0.012
Education- BS	0.224	0.417	0.221	0.415	0.225	0.418	0.862
Education- more than BS	0.206	0.404	0.103	0.304	0.234	0.424	<0.001
Children in household	1.893	1.299	1.397	0.983	2.031	1.342	<0.001
Adults in household	2.447	1.398	2.047	1.148	2.559	1.441	<0.001
Metropolitan residence	0.232	0.422	0.262	0.440	0.224	0.417	0.084
Suburban residence	0.449	0.498	0.479	0.500	0.441	0.497	0.146
Rural residence	0.319	0.466	0.260	0.439	0.336	0.472	0.002
2020 household Income ($)	70,196.81	58,775.27	50,997.85	52,673.90	75,560.55	59282.860	<0.001

[z]P-values were obtained using pairwise t-tests and indicate significance between the do not participate and participate groups.

In terms of generations, the total sample contained 5% Silent (or Traditionalist) Generation (Gen) (1928-1946), 23% Baby Boomers (1946-1964), 21% Gen X (1965-1980), 35% Millennials (1981-1996) and 16% Gen Z (1997-2012). Interestingly, after answering the first question about gardening participation, the generational breakdown shifted to contain 4% Silent Generation, 19% Baby Boomers, 22% Gen X, 38% Millennials and 18% Gen Z in the segment that participated in gardening. Therefore, the respondents in the overall sample that participated in plant related activities contained a higher percentage of Gen X, Millennials and Gen Z, while the portion that did not participate in gardening contained the largest percentage of Baby Boomers (38%). These comparison between gardening participants and non-participants in this survey support reported trends of Baby Boomer impact in the horticulture marketplace decreasing while indicating increasing Millennials and Gen Z importance in the plant market overall.

Gardener experience and interest. Generational trends are important, but consumer experiences with plants can also be important to gain a deeper understanding of their needs and how that may impact demand in the marketplace. On average, 16.5% of the gardener sample indicated they did not participate in any of the listed gardening activities (i.e., vegetable gardening, houseplants, landscaping, or flower gardening) (Table 2). The participant portion of respondents (i.e., individuals who indicated they participate in growing plants or gardening activities) who had been participating for two years or less was the largest percentage in the sample at 37.9%. Those in the 3-5 years of participation was 20.2% with 6 or more years' experience comprising 25.4% of the gardening respondents. With nearly half (46%) of the respondents representing Millennial and Gen Z and a strong majority of the sample (58.1%) with 5 or fewer years of experience, it is clear that understanding the needs of younger and less experienced plant participants is crucial to retaining and increasing engagement in the plant marketplace.

The terms "growing plants" and "gardening" encompasses many different types of plants and settings. So, understanding the specific interests of participants is important. And, with more novice and younger generations of gardeners entering the market, it is essential to know if new participant interest areas are similar or different to those individuals with more years of experience. For example, houseplants have been an area of interest for Millennials and Gen Z (gpnmag.com 2022, Knuth et al., 2021). But, new gardeners

Table 2. Participants' Years of Experience Participating In Different Gardening Activities (n=1,668).

	Vegetable gardening		Houseplants		Landscape gardening		Flower gardening		
	% of Sample (mean)	**SD**	**% of Sample (mean)**	**SD**	**% of Sample (mean)**	**SD**	**% of Sample (mean)**	**SD**	**Average**
Do not participate	19.8%	0.399	11.6%	0.321	20.7%	0.406	13.7%	0.344	**16.5%**
<1-2 years	37.4%	0.484	39.1%	0.488	36.1%	0.480	39.1%	0.488	**37.9%**
3-5 years	19.8%	0.399	21.2%	0.409	18.7%	0.390	20.9%	0.407	**20.2%**
6+ years	23.0%	0.421	28.1%	0.449	24.5%	0.430	26.3%	0.440	**25.4%**
Total	100.0%		100.0%		100.0%		100.0%		**100.0%**

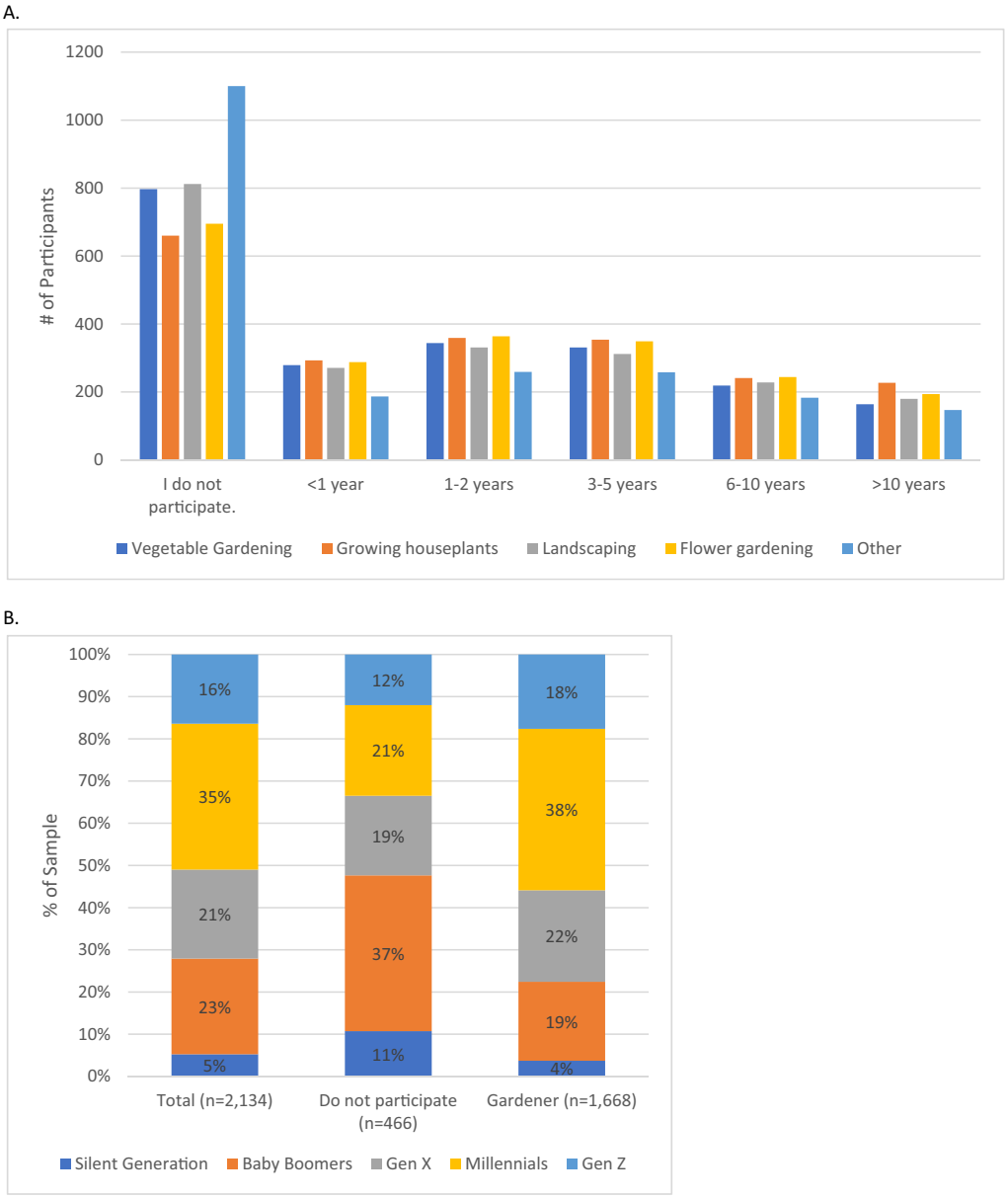

Fig. 1. **A. Number of participants interested in vegetable gardening, growing houseplants, landscaping, and flower gardening within the portion of the sample who reported they participated in garden activities. (n=2,134.) B. Survey participant breakdown by generation in the total survey population as well as the subsets of participants that participate in gardening and those who do not participate in gardening.**

and younger generations have also been linked with edible crops and food production (Gardenmag.com 2016, Whitinger and Cohen 2022). Interestingly, our survey results showed very similar patterns of interest for the four broad types of gardening we assessed among the respondents who reported that they participated in plant and garden related activities (Fig. 1). In fact, our samples of gardeners with 1-2 years of experience had comparable levels of interest in vegetable gardening, growing houseplants, landscaping, and flower gardening as the respondents with 3 to 5 years of experience and 6 or more years of experience.

While trends among respondents who identified themselves as growing plants or gardening were relatively consistent across areas of interest and time, as shown in Figure 1, differences were distinct between the plant participants and non-participants. Figures 2 and 3 provide responses on key statements about how respondents describe themselves and their relationships with plants. In these figures, values indicate level of agreement with the statements describing the participant. Specifically, -1 indicates does not describe me, 0 neutral, and +1 describes me. It is clear from the level of disagreement being less than -0.4 that those who do not participate in gardening do not self-identify with the terms "gardener", "plant parent", or "plant saver" (Fig. 2). Conversely, the level of agreement with statements "gardener", "plant parent", or "plant saver" were all positive in the group that participates in gardening and plant activities. Interestingly, the level of disagreement with these statements was higher among non-participants than agreement was among participants suggesting that those who engage with plants identify with a range of terms. The "I appreciate plants" statement provided particularly interesting

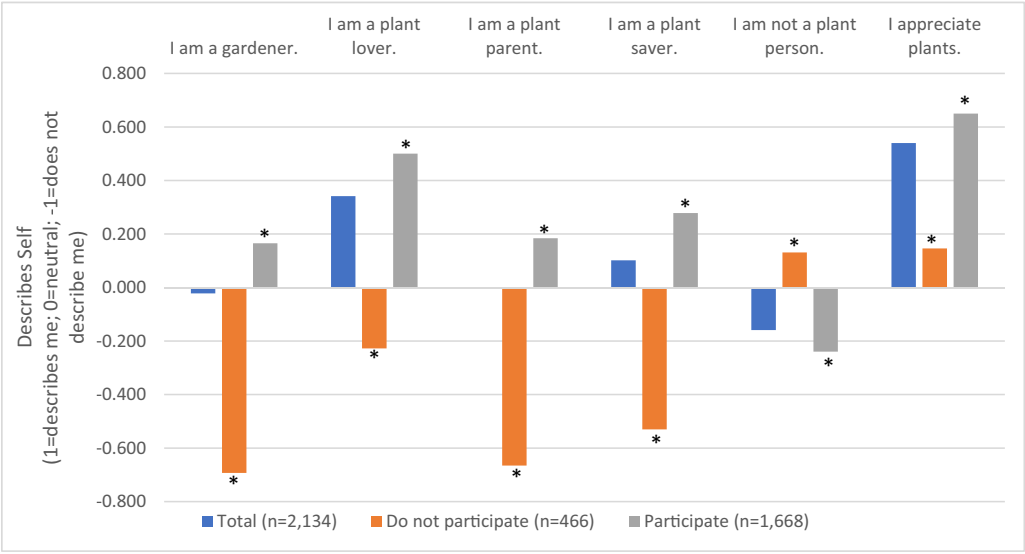

Fig. 2. Level of agreement or disagreement about six statements describing how the total of respondents as well as those who do not participate in gardening activities and those who do participate in gardening activities view themselves in relation to plants. A * indicates significance between do not participate and participate groups at the 1% level. Pairwise t-tests were used to estimate significance between the groups.

results as both the plant participant and total respondent groups have strong levels of agreement (0.65 and 0.54, respectively). However, the non-participant group also had a positive level of agreement with the statement (0.146). These results suggest that even those who do not actively participate in growing plants and who do not self-identify with key plant or gardening terms generally appreciate plants.

Figure 3 provides additional insight into the attitudes of those who participate in plant activities and those who do not. Those who grow plants or garden had a strong level of agreement (0.571) with the statement "Plants make me happy" with positive but lower levels of agreement to a statement about attitudes associated with the challenges of growing plants ("I keep trying with varying levels of success"; 0.354) and time ("I wish I could work more with plants"; 0.344). Those who participate in plant related activities and those who do not also differed in their reactions to the statement "My plants die" with participants disagreeing (-0.099) and non-participants agreeing (0.178). Similar to the discussed statement about appreciating plants, both the plant participants (-0.443) and non-participants (-0.262) disagreed with the statement "I do not really like plants". The levels of agreement and disagreement with these statements about liking and appreciating plants as well as statements about persistence in trying to grow plants and plants dying suggest there may be key differences in success and/or continued efforts to grow plants with an initial lack of success between the participant and non-participant populations. The trends of all groups

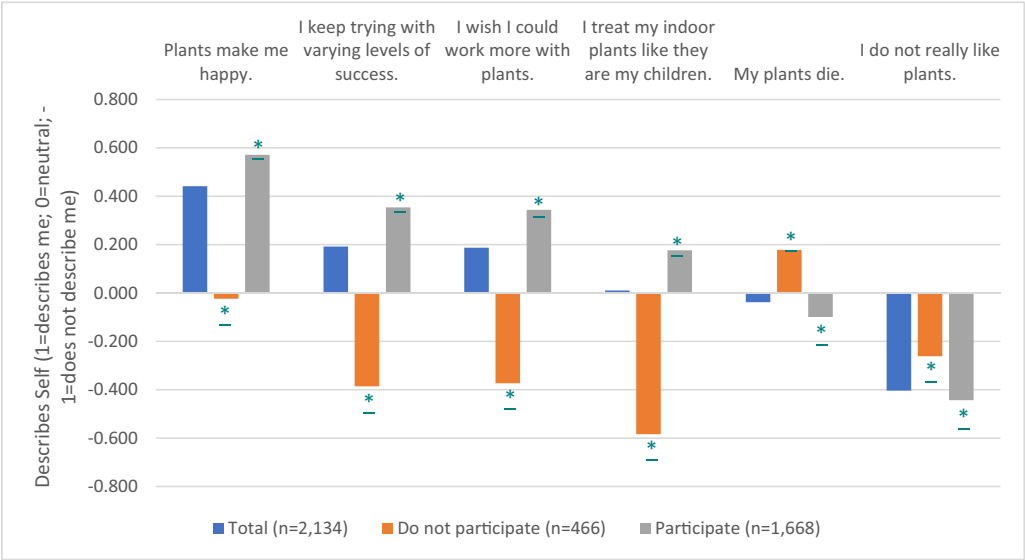

Fig. 3. Level of agreement or disagreement about six statements describing perceptions of plants of the total of respondents as well as those who do not participate in gardening activities and those who do participate in gardening activities. A * indicates significance between do not participate and participate groups at the 1% level. Pairwise t-tests were used to estimate significance between the groups.

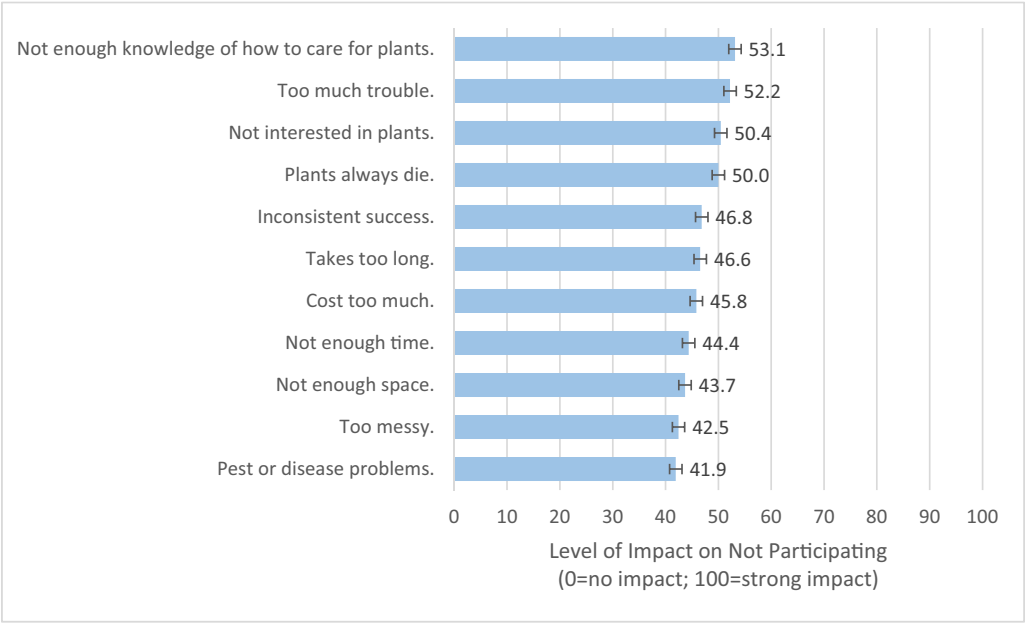

Fig. 4. Reasons for not growing plants or gardening in terms of the percentage of agreement of the non-participant group of respondents (n=466).

having a reasonable liking and appreciation for plants but differing levels of success and resilience through failure suggest that the reason for not growing plants may be more about avoiding failure or frustration than lack of interest.

Reasons for not growing plants or gardening. Understanding the reasons for not growing plants will be important for the horticulture industry to address the concerns of non-participants and potentially engage them in future plant buying and growing activities. As presented in Figure 4, participants who do not grow plants or garden indicated how much various reasons impacted their choice to not garden with 0 indicating no impact and 100 indicating a strong impact. The highest rated reason is "Not enough knowledge about how to care for plants", followed by "Too much trouble", "Not interested in plants", and "Plants always die". Each of these reasons had a mean rating of 50 or above and were significantly different from the seven other listed reasons. None of the top four reasons for not gardening were significantly different except for the "Not enough knowledge of how to care for plants" and the "Plants always die" statements. While one of the top four reasons for not growing plants was a lack of interest, the other three were more clearly related to lack of knowledge and success, indicating an opportunity to address the reasons for lack of plant engagement for a relatively large number of non-participants.

Correlations found in Table 3 elucidate relationships between the reasons for not gardening among those in this study who do not participate in gardening or plant related activities. There were several strong correlations among the most common statements displayed in Figure 4. This shows common themes that could be used to address reservations of current non-participants and expand the gardening audience. These correlations also enable a more nuanced picture of the "Not interested in plants" reason for not gardening that was the second highest rated reason in Figure 4. The strongest correlations with the statement "Not enough knowledge of how to care for plants" were with "Plants always die", "Too much trouble", "Inconsistent success", and "Takes too long". The statements "Too much trouble", "Too messy", and "Takes too long" were all highly

Table 3. Correlations demonstrating significant relationships between participants' reasons for not gardening.[z]

	Not enough time.	Not interested in plants.	Plants always die.	Not enough knowledge of plant care.	Too much trouble.	Pest or disease problems.	Cost too much.	Not enough space.	Inconsistent success.	Too messy.	Takes too long.
Not enough time.	1.000										
Not interested in plants.	**0.431**	1.000									
Plants always die.	**0.538**	**0.432**	1.000								
Not enough knowledge of plant care.	**0.576**	**0.515**	**0.679**	1.000							
Too much trouble.	**0.493**	**0.633**	**0.574**	**0.603**	1.000						
Pest or disease problems.	**0.611**	**0.418**	**0.525**	**0.577**	**0.530**	1.000					
Cost too much.	**0.534**	**0.497**	**0.503**	**0.519**	**0.579**	**0.565**	1.000				
Not enough space.	**0.572**	**0.351**	**0.488**	**0.564**	**0.468**	**0.594**	**0.540**	1.000			
Inconsistent success.	**0.538**	**0.370**	**0.714**	**0.605**	**0.505**	**0.578**	**0.499**	**0.550**	1.000		
Too messy.	**0.558**	**0.602**	**0.510**	**0.557**	**0.664**	**0.642**	**0.650**	**0.570**	**0.531**	1.000	
Takes too long.	**0.660**	**0.607**	**0.577**	**0.629**	**0.688**	**0.641**	**0.654**	**0.577**	**0.548**	**0.762**	1.000

[z]Note: Correlation coefficients were used to test for significant differences at the 5% level, which is indicated by bold font.

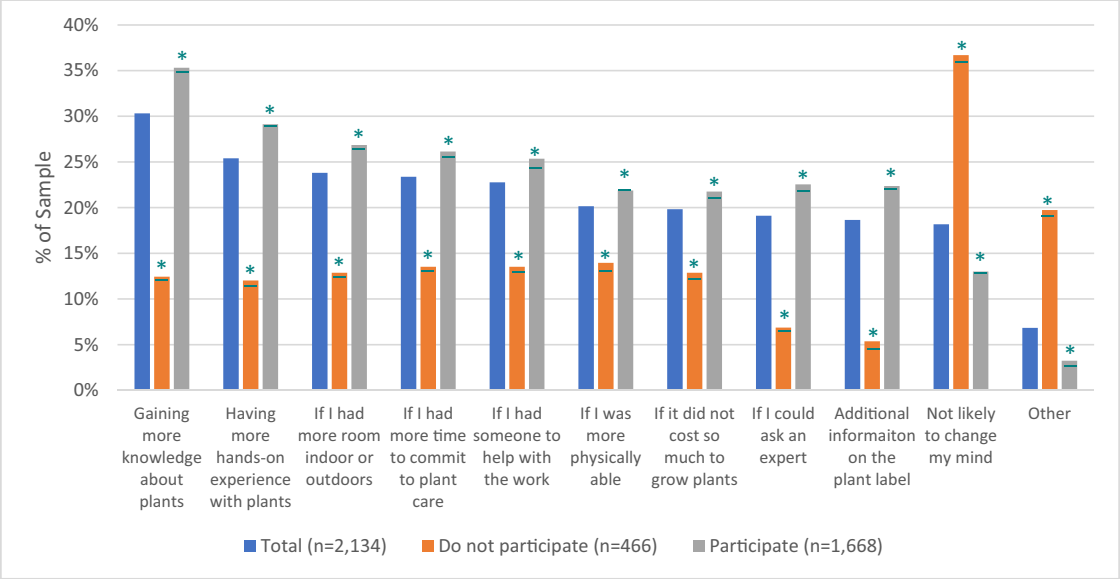

Fig. 5. Percentages for the total survey respondents, respondents who do not participate in gardening and respondents who do participate in gardening groups who agree with statements that would help them feel more comfortable with plant related activities. A * indicates significance between do not participate and participate groups at the 1% level. Pairwise t-tests were used to estimate significance between the groups.

correlated with each other. "Plants always die" was strongly correlated with "Not enough knowledge of plant care" and "Inconsistent success". Similarly, the strongest correlations between the statement "Not interested in plants" were with the statements "Too much trouble", "Too messy", and "Takes too long". The many correlations between these most common statements regarding a lack of plant participation show the interconnectedness of plant knowledge (or the lack thereof), failure, and frustration. Overcoming these lack of interest statements is therefore likely to require addressing both knowledge and success. In many ways, these statements indicate more a lack of success and confidence than an actual lack of interest that could be a focal point of marketing and education efforts.

Addressing the hurdles to consumer participation with plants and gardening. A clear understanding of consumers' reasons for non-participation in growing plants and gardening can create a framework for addressing the challenges of engaging new customers and open the door to broader consumer participation. Figure 5 presents responses on what would make them more comfortable participating in plant activities. For current participants in plant growing and gardening, the highest percentage of the sample (35.3%) selected "Gaining more knowledge about plants" with 29.1% stating "Having more hands-on experience with plants". These statements by current participants indicate opportunities for higher engagement through knowledge attainment and experiential events. In fact, there were nine statements or factors selected by more than 20% of the sample that would make those who currently participate in plant growing or gardening feel more comfortable in their plant-related activities. In addition to the knowledge and hands-on activity discussed above, other factors included other content-related options like asking an expert or seeing more information on the plant tag. Other factors related to time, space, and cost could be indirectly addressed through providing education about space and time-efficient methods or a better understanding of selecting plants for specific locations or uses. With this wide range of opportunities to increase the comfort level of those currently gardening, there are many encouraging avenues for the horticulture industry as a means of expanding the marketplace role of these participants.

For current non-participants, Figure 5 does show that 36.7% would be unlikely to engage in plant activities. However, that means more than 60% of those in the non-participant group reported factors that would be likely to increase their comfort with interacting with plants. Unlike participants, there were no factors rated higher than others. Seven factors were selected by more than 12% of non-participants including gaining more knowledge and hands-on experience as well as having more room, more time, assistance, physical ability, and lower cost options. It is true that 12-14% agreement with these statements means that no one method will reach a high number of non-participants. However, the fact that factors encouraging comfort with plant activities was quite similar between participants and non-participants means that the same techniques can be used to reach a wide audience of consumers.

In conclusion, this study shows that education and practical hands-on engagement with plants can be a route to increase knowledge and expand the level of engagement with current gardeners as well as potentially lay the foundation to reach current non-participants. However, reaching current and potential customers with dynamic and impactful education should not be left solely to already strapped horticulture retailers and growers. Small to mid-scale retailers most likely to benefit from educational efforts to engage new audiences may well be the industry members with personnel limitations that would make these types of outreach and education efforts the most challenging. Addressing these challenges could be synergistically accomplished by collaborations between Extension educators and local horticulture retailers. Extension personnel,

including state specialists who conduct applied research and local educators who already engage with broad consumer audiences, are well-equipped to deliver interactive educational sessions in a range of in-person to digital platforms. Such educational collaborations would benefit land-grant Extension personnel both in understanding key hurdles that can fuel research and in reaching new audiences as traditional print and lecture formats are increasingly unsuccessful in connecting with younger generations. Likewise, horticulture producers and retailers would benefit from collaborations with Extension educators presenting, teaching, or engaging at their businesses because their staff would be able to focus on production and sales while Extension personnel could engage in teaching and sharing of nonbiased, research-based horticulture information. However, in a marketplace with changing generations and experience levels, carefully tailoring educational methods to the needs and motivations of current and potential gardeners will be crucial to success in reaching and retaining horticulture customers.

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