

Features

Importance of Horticulture and Perception as a Career

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SUMMARY. The American Society for Horticultural Science (Alexandria, VA) and Longwood Gardens (Kennett Square, PA) engaged FleishmanHillard (FH, Washington, DC), a nationally recognized communications and marketing firm, to conduct research with internal and external audiences to determine the public perception of horticulture and careers in horticulture. Through stakeholder focus groups and general public online and phone surveys, the importance of horticulture, career perceptions, and the need for the promotion of horticulture were examined. Students, faculty, industry, and administrators in horticulture have a broad understanding of the field, much more than the public, especially young, ethnically diverse, and lower income participants. Although lack of public awareness is one of the biggest challenges in horticulture, it is also its greatest opportunity. Sixty-five percent of all phone survey participants as compared with 41% of 18–24 years old revealed a general awareness of the word horticulture. General public found agreement (48% to 59%) with four statements about the essential, universal, and invaluable worth of horticulture; however, strong agreement was less, ranging from 26% to 46%. Only 26% of respondents felt strong agreement with the statement, “Horticulture is a diverse area of study, and it offers viable, fulfilling, and respected career paths that I would recommend to others.” The research found strong stakeholder support for a national promotion of horticulture.

Our world is highly dependent on horticultural expertise to provide the technology and people necessary to meet the rapidly increasing global demand for fruits,

vegetables, nuts, herbs, and ornamentals in the face of the changing global environment and limited natural and financial resources (Siegel et al., 2014). Horticultural science is critical in improving the nutritional content of food, enhancing the safety of our produce supply, and increasing the availability of healthy, local, and sustainably produced foods (Rubatzky et al., 2012). In addition, the role that horticulture plays in promoting positive mental well-being, on a large scale from public botanic gardens, parks, and sports fields, to small-scale individual home gardens is critical to our life today (Hall and Dickson, 2011).

Despite the increasing value of commercial horticulture crops and services (U.S. Department of Agriculture, 2009) university horticulture programs have plateaued or experienced declining student enrollment, with only 31% of 4-year schools indicating the word “horticulture” was still in their department title (Dole, 2015). Arnold et al. (2014) surveyed graduate programs, showing enrollment declined in 39% of MS and 31% of PhD programs at land-grant universities in the last 5 years, whereas 21% and 27% of programs increased and 23% and 41% were steady, respectively, for MS and PhD programs.

Jobs in horticulture are available: an average of 35,400 new U.S. graduates with expertise in food, agriculture, renewable natural resources, or the environment, are expected to fill only 61% of the expected 57,900 average annual openings (Goecker et al., 2015). Concurrently, the horticulture industry shows a shortage of trained professionals with a gap between students graduating and employees needed for many areas of horticulture (Dickey, 2014; Needleman, 2014).

The perception of horticulture is often limited (Higgins, 2014) and increasingly negative (Smith, 2014). Plant blindness, defined as “the inability to see or notice the plants in one’s own environment, leading to the inability to recognize the importance of plants in the biosphere and in human affairs” (Wandersee and Schussler, 2001) along with more than 53 h per week in screen time (Kaiser Family Foundation, 2010) and only half as much time outdoors for young people (Juster et al., 2004) have affected the perception of plants and reduced children’s interaction with plants and their choice of careers involving plants.

Limited awareness of horticulture and insufficiently trained employees are not localized to the United States. In Australia, the government developed specific strategies to promote horticulture (Collins and Dunne, 2009; McEvilly and Aldous, 2010), perhaps based on an earlier comment: “The horticultural industry does not effectively and positively sell itself generally to the broader community, and more specifically to parents, guidance officers/career counselors

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and students. A whole-of-horticulture promotional/public relations campaign is clearly needed to achieve this purpose” (Stone et al., 2005). In Britain, the Royal Horticultural Society (RHS) used a collaborative approach involving parliament and industry documented in *Horticulture Matters*, but still reported 70% of horticultural businesses struggled to fill skilled vacancies (RHS, 2015). The International Society for Horticultural Science also addressed the importance of horticulture and its diverse career options in its publication (Hewett et al., 2012).

Leadership in American Society for Horticulture Science (ASHS) and Longwood Gardens realized the limited public, especially youth, awareness of horticulture and careers in horticulture and the lack of trained professionals. Several horticultural administrators at land-grant universities also recognized this limited perception and agreed to financially support this initiative. To better understand the public perception and importance of horticulture, the challenges the industry is facing, and the various paths individuals take to get into the field, ASHS and Longwood Gardens engaged FH to conduct qualitative and quantitative research with internal and external audiences as a first step to addressing these issues.

Materials and methods

Qualitative, informal, and intercept interviews were conducted by FH at the July 2014 Cultivate’14 trade show and conference (American Hort, Columbus, OH). Participants included current horticulture students, young professionals [e.g., 40 under 40 (Fortune magazine’s recognition of emerging leaders under 40 years of age); Unplugged (young professionals networking event at Cultivate’15)], academics and industry professionals [e.g., American Floral Endowment (Alexandria, VA); and Florasearch (Sanford, FL)]. Intercept survey information was not extensive enough to draw conclusions, but was used to formulate the questions for the subsequent focus groups and online and phone surveys.

A formal focus group was conducted in Columbus, OH, with 26 garden educators and coordinators at the July 2014 National

Children & Youth Garden Symposium (NCYGS), sponsored by the American Horticultural Society (AHS, Alexandria, VA). Registrants were solicited by e-mail and on site during the conference to participate in the 2-h focus group. The final five focus groups were conducted in Miami, FL, at the July 2014 ASHS Annual Conference with current horticulture undergraduate students ($n = 7$), graduate students ($n = 8$), industry leaders ($n = 6$), faculty ($n = 7$), and university administrators ($n = 5$). Registrants were solicited via e-mail and during the conference to attend the 2-h focus groups.

Focus group discussions were informal, with one person asking questions to the group that participants could answer at will. Focus group questions were divided into three sections: importance of horticulture, horticultural careers, and promotion of horticulture, with 6–10 questions per section. Selected, key questions were as follows: Horticulture Importance: Why is horticulture important? How does horticulture benefit society? What is the public’s perception of horticulture? What do you consider to be the biggest challenges facing the horticulture industry? Careers: When did you first start considering horticulture as a career field? How did you first learn about it? What concerns, if any, did you have about pursuing a career in horticulture? What do you believe are the biggest benefits of this career field? Why would you recommend students to consider horticulture as a career field/area of study? For what reasons, if any, would a student not choose horticulture as a career field/area of study? Promotion: This initiative will focus on middle- and high-school students; what do you perceive as the biggest challenge in reaching this audience? In reaching and motivating this audience, what role do you think industry should play?

An online survey was developed by ASHS and FH and was open to anyone with the URL, but was promoted primarily to horticulture stakeholders at conferences and presentations from June through Oct. 2014 (ASHS, 2014) and was removed in early 2015. The online survey consisted of four open-ended questions: 1) Why should the general public care about horticulture?

2) What do you consider to be the biggest challenges facing the horticulture industry? 3) Why would you recommend horticulture as a career field to students/youth? 4) In reaching and motivating high-school students to become interested in horticulture, what role do you think the industry should play?

In June 2015, an omnibus phone survey was conducted by ORC International (Princeton, NJ) for FH to obtain a baseline measure of the broader U.S. public’s awareness and perceptions of horticulture. The study was conducted using two probability samples: 509 randomly selected landline telephone numbers and 500 randomly selected mobile (cell) telephone numbers. The combined sample consisted of 1009 adults (18 years and older) living in the continental United States and representative of the U.S. adult population. The margin of error for the sample of 1009 was $\pm 3.09\%$ at the 95% confidence level. Smaller subgroups had larger error margins.

Phone participants were asked to respond to four questions: 1) Before today were you familiar with the word horticulture? 2) How would you define horticulture (open-ended question)? 3) How much do you agree with the following definition of horticulture? “As you may or may not know horticulture is the art, science, production, business and use of fruits, vegetables, flowers and ornamental plants. This could mean food and nutritional plants including fruits, vegetables, mushrooms, and culinary herbs. Or it could mean non-food plants such as flowers, trees, turf-grass, hops, and shrubs. Both food and non-food uses have applications in small businesses as well as large corporations. And both can greatly impact our health and well-being”; and 4) participants were asked how much they agreed or disagreed with four statements about horticulture (Fig. 1).

Results

A total of 59 people participated in the six focus groups at the AHS and ASHS conferences. The online survey received 511 usable responses, whereas the phone survey had 1009 usable responses. Results were compiled into qualitative data from the focus groups and quantitative data

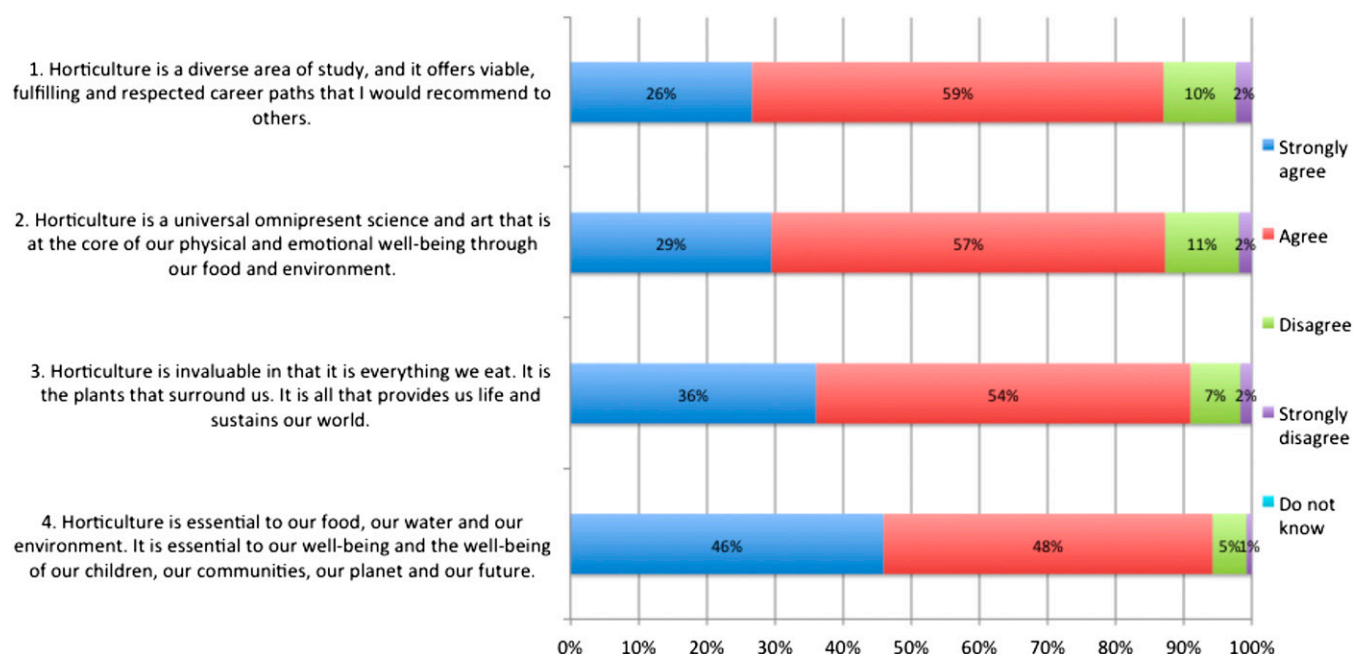


Fig. 1. Participant responses ($n = 1009$) to a general public omnibus phone survey about horticulture when asked: “To what extent do you agree or disagree with the following statements about horticulture?” Statement 1: The smallest number of respondents strongly agreed with this statement; 3% responded do not know. Statement 2: White respondents were more likely to strongly agree (32%) with this statement than Hispanic respondents (20%); 2% responded do not know. Statement 3: Those 35+ years old were more likely to strongly agree (42%) with this statement than those 18–34 years old (22%). White respondents were more likely to agree or strongly agree (92%) with this statement than Hispanic respondents (83%); 1% responded do not know. Statement 4: Those 35+ years old were more likely to strongly agree (51%) with this statement than those 18–34 years old (34%); and 1% responded do not know.

from the online and phone surveys. The responses were summarized into three sections: 1) the importance and perception of horticulture, 2) horticulture as a career including engaging youth and challenges facing the industry, and 3) the need for a national initiative to promote horticulture.

IMPORTANCE AND PERCEPTION OF HORTICULTURE. All focus groups agreed that horticulture is an extremely important field that is often undervalued and misunderstood; all felt that the public does not fully value and understand horticulture. Participants felt the general public should care about horticulture, because it protects the ecosystem and environment, provides visual aesthetics and places of tranquility to urban areas, helps with conservation, produces food, and connects people to the earth and environment. Specific comments included “It’s basically how we maintain our lives. Without it, no food, air, water, anything” (undergraduate student); “Beauty, enjoyment and mental health.” (NCYGS participant); “Supply food to one-third of the

American diet. Without horticulture, life would be extremely boring. Just look at sports turf, your diet, how we comfort ourselves during funerals and celebrate life with flowers. It makes life interesting” (administrator). The online survey showed similar responses on the importance of horticulture with health and nutrition benefits showing the highest recognition of 66% (Table 1).

Using the phone survey as a subsample of the U.S. population, it is possible to extrapolate how different demographic segments would respond to the question “Before today were you familiar with the word horticulture” (Table 2). When asked about familiarity with the word horticulture, 65% of phone survey participants indicated yes, whereas 35% were not or did not know enough to respond positively. When examined by age category within the 65% who indicated yes they were familiar with the word horticulture, 57% were 30–34 years old, 50% were 25–29 years old, and only 41% of 18–24 years old respondents indicated they were familiar with the word horticulture.

Table 1. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “Why should the general public care about horticulture?” ($n = 488$).

Benefit cited	Responses (%)
Health/nutritional	66
Educational	43
Aesthetic	43
Environmental	35
Relationship with nature	29

Although not statistically significant, awareness tends to trend lower with younger Americans.

When asked to define horticulture (open-ended question), 86% of respondents said it involved plant growth or care; 46% mentioned cultivating, planting, growing, or caring for plants; 35% said horticulture was related to plants or the science and study of plants; and 21% said horticulture was gardening. After hearing a definition of horticulture (see methods and materials above), 41% responded that it was “a lot” in

Table 2. Extrapolated responses to reflect the U.S. population by demographic based on a June 2015 general public omnibus phone survey about horticulture. The survey question was: “Before today were you familiar with the word horticulture?” (n = 1009).

Demographic	Respondents familiar with the word “horticulture” (%)
18 to 34 years old	48
35+ years old	72
Caucasian	76
African American	49
Hispanic	41
<\$50,000 Income	54
>\$50,000 Income	78
College degree	80
Some college	71
High school or less	52

alignment with their personal understanding; 36% said “somewhat,” 10% said “not much” and 7% said “not at all.” Those 35+ years of age were more likely to say the definition aligned a lot or somewhat (81%) with their understanding than those 18–34 years old (67%). White respondents were more likely to say the definition aligns a lot or somewhat (82%) with their understanding than Hispanic respondents (68%). U.S. adults with a college degree (84%) or some college education (80%) were more likely to say the definition aligns a lot or somewhat with their understanding than those with a high school education or less (70%). The phone survey found agreement (48% to 59%) with three statements about the essential, universal, and invaluable worth of horticulture; however, strong agreement was less, ranging from 29% to 46% (Fig. 1).

HORTICULTURE AS A CAREER. Individuals found horticulture through a number of different paths, but often it started with a garden. While some individuals were exposed to horticulture at a young age through a family garden, others were drawn because of their interest in science. Some of the focus group responses to questions about how they found horticulture were: “Ever since I could remember, I was in a garden, helping my grandfather” (undergraduate student); “Fifth grade. A teacher explained nature well and explained that they

could make a career in it” (NCYGS participant); “For me, it was my first veggie garden. I was 24. It was the first thing in my life that I loved doing. I started looking for careers I could have that would help me work with plants” (undergraduate student); “I gardened with my grandma. I’d rather be outside. The desire to be outside and being interactive” (undergraduate student).

Once individuals discovered horticulture, they also realized a number of attributes that made it an appealing profession: job availability, work outside; creative, artistic; innovation, technology related; and the work could impact the world, environment. Comments from focus group participants were: “As a kid, I did Boy Scouts, things to do with nature. I had friends in high school that did Future Farmers of America, (FFA). That was my first exposure. As an undergrad, I was pre-dental. I was two years in and getting really bored. I took horticulture as an elective. I discovered that there’s research and development. They have marketing, all these different parts of the business. I realized I could have a career here that it’s not just farming. That peaked my interest” (graduate student); “One of the driving factors was that I knew there would be jobs in this industry” (graduate student); “There are so many technology-related things in horticulture that don’t come to mind immediately to people. High tech greenhouses, light-emitting diode (LED)” (industry); “People need to realize they can make a difference through horticulture, even if they aren’t making as much money” (NCYGS participant); “Most seniors have between five and 10 job offers. How many other fields can say that. There are constant opportunities” (undergraduate student).

Online survey participants felt rewarding and satisfying work, diversity of jobs, and the ability to work outside were reasons to recommend horticulture as a career (Table 3). Low pay was the most cited reason for not recommending horticulture as a career (66%), followed by negative working conditions (27%) (Table 4).

Focus group participants perceived similar drawbacks to pursuing a horticulture career: low pay, yet even this was debated because there

is such a wide range of jobs available. “The profession doesn’t make nearly as much money as other industries, but it is important and people love it” (NCYGS participant). “It’s more than just plants and public gardens” (undergraduate student). “My concern is that I’m never going to make good money. I’ll be relegated to less than \$15 per hour. I’d rather not make a lot of money and love my life” (undergraduate student).

Only 26% of phone survey respondents felt strong agreement with the statement of viable horticultural careers that they would recommend to others; however, 59% of respondents did agree with this statement (Fig. 1).

ENGAGING YOUTH IN HORTICULTURE. Focus group stakeholders felt there were a number of factors that make horticulture a desirable profession, which should be used when encouraging others to consider the field. They felt that better communicating the advantages, such as job availability, creative and artistic outlet, working outside, and impacting the world, would help to attract the next generation of horticulturists. “Show them there’s a lot to do. Wide range of jobs. If you get in this career, you have a bunch of doors open. You can be a teacher, researcher, working for the industry” (graduate student). “Anything to do with growing food is job security. Wanting to make a difference. And the idea that they’re dealing with plants” (industry). “People need to realize that horticulture is a real profession that they could do. They don’t see it as work” (NCYGS participant). “You can be your own boss. You can be outside. You can be creative and an entrepreneur” (NCYGS participant). “They’re interested in nutrition, sustainability, environment, genetics, but they’re starting to understand we’ll have to feed more people. So we’re starting to get them for other reasons” (administrator). “People need to know that it can be a lucrative career. Horticulture doesn’t mean you’ll be poor for the rest of your life” (undergraduate student).

Online survey respondents recognized the importance and need of engaging youth in horticulture as well as ways to successfully get youth interested in horticulture: 33% cited

Table 3. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “Why would you recommend horticulture as a career field to students/youth?” (n = 482).

Reason for recommending horticulture	Responses (%)
Rewarding can see quick results, satisfying work, making a difference, and fulfilling	28
Diverse, variety, and range of careers available	26
Ability to work outside and working with nature	25
Good for the community, helping others, and can help feed others	23
Impacting the world, environment, and improving the environment	21
Interest in plants, like working with plants, and pleasure in working in nature	16
Growing opportunities and many job opportunities	15
Learning opportunities, good knowledge to have, and many skills learned	13
Enjoyment and fun work	12
Ability to be creative and to create	10
Good for health and being active	10
Good career field and positive (general)	4
Needed and always will need plants	3

Table 4. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “For what reasons, if any, would a student not choose horticulture as a career field?” (n = 481).

Reason	Responses (%)
Low pay, money, financial reasons	59
Physically demanding, hard work, have to be a hard worker, and work long hours	27
Lack of interest and/or knowledge and no interest in plants	22
Bad image, lack of industry support, no respect, and not seen as professional	16
Dislike working outdoors, dislike bugs, affected by allergies, and too much sun	10
Lack of career options and career paths limited	9
Seasonal work and hard to find work	8
Dirty work and dislike getting dirty	6
Poor career field and negative (general)	4

Table 5. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “In your experience, what is most successful at getting youth interested in horticulture?” (n = 480).

Reason	Response (%)
Gardens, having a garden, watching plants grow, growing own food, and food production	33
Hands-on experience and getting hands dirty	31
Early exposure and positive early experiences	16
Teach about plants, develop knowledge, and awareness of plants (nonspecific)	13
Experience, exposure to outdoors, and working in nature (nonspecific)	12
Integration with school curriculum and programs	9
Family activities, family engagement, and planting at home	6
Good mentors and teachers	6
Involvement in clubs that support and promote horticulture	5
Field trips and visit or tour gardens	5
Connection with nature, how nature is related to us, and how it impacts our lives	5
Make it fun and make it exciting	5
Internships, scholarships, and career fairs	3

gardens, having a garden, watching plants grow, growing own food, food production would engage youth and 31% suggested hands-on experience, getting hands dirty to interest kids (Table 5). It is interesting to note that 30% of online survey respondents believe that the industry can play a role in engaging youth by providing internships and scholarships (Table 6) but this role was cited by only 3% in the previous table. Perhaps internships and scholarships are the traditional means of connecting industry with students and other creative ideas are needed to reach young people.

CHALLENGES FACING THE HORTICULTURE INDUSTRY. Focus group participants indicated the industry is facing a number of challenges: shrinking university programs, consolidation of degree programs, skilled labor shortage, lack of industry leaders and a well-trained workforce, lack of funding and grants, lack of public awareness and understanding, and low pay. The good news is that most everyone felt these challenges could be overcome by increasing public awareness and understanding of the value of horticulture. Stakeholders felt the perceptions of the industry can improve through focus on the benefits, by making horticulturists more visible and showing connections to science and technology. “When people ask what I’m majoring in and I say ‘horticulture,’ people don’t know what it means” (graduate student). “More often than not, they equate what we do with gardening. That’s the other end of the spectrum. It’s not the science” (administrator). “The word ‘horticulture’ is disappearing from the university landscape. A lot of people don’t know what it is. The stereotype is a shovel in one hand. Now some of the best students are moving into environmental science. That’s concerning” (industry). “Industry would say there is a lack of trained labor. Not even basic skills. And we’re not turning out enough students to take these jobs. There’s not a job shortage in horticulture, there’s a pipeline shortage” (faculty). “I think it [consolidated programs] matters. I almost feel deprived. I don’t get to lead with a specialty. When you merge with plant sciences, you’re even further away from horticulture. It’s so much

Table 6. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “In reaching and motivating high-school students to become interested in horticulture, what role do you think the industry should play?” (n = 477).

Industry role	Responses (%)
Internships and scholarships	30
Provide hands-on opportunities, gardening, and field trips	28
Educate, teach, and speak with students about horticulture (nonspecific)	15
Good opportunities, viable career options, and career possibilities	14
Promote careers and participate in career days (nonspecific)	13
Support school programs, clubs, workshops, and classes	12
Provide funding, sponsor, and involvement (nonspecific)	9
Good mentors and learn from professionals	7
Partnerships with high schools and outreach	6
Environmental responsibility, sustainability, and making improvements in nature	4
Improve image and more positive exposure	3
Value to society and making connections to everyday life	1

Table 7. Participant responses to a public online survey promoted to horticulture stakeholders from June through Oct. 2014, to the question: “What do you consider to be the biggest challenges facing the horticulture industry?” (n = 487).

Challenge	Responses (%)
Education and awareness challenges	54
Economic challenges	42
Lack of respect, seen as unskilled labor and anyone can do it	17
Environmental challenges	17
Not seen as important, lack of interest, support, and apathy (nonspecific)	9

more than plant biology” (undergraduate student).

Online survey participants mentioned similar challenges, 54% cited education and awareness challenges, whereas 42% mentioned economic challenges (Table 7). Phone survey participants revealed a general awareness of horticulture, but 35% were not aware of the word, and the younger the respondent, the more limited their perception (59% of 18–24 years old were not aware of the word), especially for career opportunities.

PROMOTING HORTICULTURE INITIATIVE. Focus group participants were briefly introduced to the idea of a national promotion for horticulture. However, there were different points of view regarding where the initiative should focus its efforts. Public garden professionals tended to recommend starting with elementary-aged children. Others made a strong case for middle- and high-school students. Still, there appears to be an opportunity to reach individuals once they’ve entered a university. Making people more aware of all the benefits associated

with a career of horticulture and aware of horticulture itself appears to be the key to growing the profession. Overall, focus group survey respondents support the initiative and want to see stronger youth engagement in horticulture.

Conclusions

Stakeholders were in agreement that limited public awareness is one of the biggest challenges facing horticulture; participants in the general public phone survey showed 48% to 59% agreement and 26% to 49% strong agreement with statements about horticulture’s importance. Given the number of benefits associated with the industry—available jobs, science/technology, environment and human benefits, working outdoors, etc., all benefits valued by millennials (persons reaching young adulthood around the year 2000) and other youth audiences, communicating these attributes can help pique individuals’ interest in the field. Interesting, challenging, and impactful careers are available in horticulture at all levels, and

there is an increasing need for educated, well-trained students.

A limited awareness of horticulture including the diversity of careers has likely hindered students from pursuing this field of study. When Wandersee and Schussler (2001) studied plant blindness, they found “early and iterative, well-planned, meaningful and mindful education (both scientific and social) about plants—coupled with a variety of personal, guided, direct experiences with growing plants—may be the best way to overcome what we currently see as the human “default condition”—plant blindness.”

This research found strong support for promoting horticulture, now branded the Seed Your Future campaign. Nearly 100% of horticulture stakeholders that took part in the focus groups volunteered their support and enthusiasm for the campaign, indicating a great need in the industry. To appeal to youth, it will be important for any promotion of horticulture to present a youthful, fresh face for students in middle and high school, and where possible, elementary school. By showcasing horticulture’s innovation with science, technology and the breadth of work taking place across the industry that can impact major, global issues, it is hoped that a new image for and awareness of horticulture can be created.

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