Are We on the Same Page? Exploring National, State, and Local Educational-response Themes for Extension Master Gardener Coordinators and Volunteers

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Abstract. Extension provides outreach to the general public and works to disseminate the latest information and research generated by land grant university (LGU) scientists. The Extension Master Gardener (EMG) volunteer program is one of the most widely recognized programs of extension, created to educate people about research-based consumer horticulture (CH) and gardening practices through a network of trained volunteers. Ideally, EMG program initiatives should address local issues and needs and align with the priorities of extension’s federal stakeholder, U.S. Department of Agriculture National Institute for Food and Agriculture (USDA NIFA). Before 2015, there were no national standards for EMG volunteer programs, and at this time, there is no official work plan or prioritization of educational programming. A quantitative national study of EMG state and local coordinators and volunteers was conducted in Fall 2016 to assess the importance of six educational-response themes (ERTs) (i.e., the strategy for EMG volunteer outreach) for program management (state and local coordinators) and program participants (EMG volunteers). The study compared theme importance between program management and participants, and, in turn, allowed a comparison with previously published historical data. Response to individual inquiry is consistently the most important ERT for EMG programs, regardless of the responder position within the program (management or volunteer). Results revealed that state and local coordinators (program management) score ERTs similarly. EMG volunteers score the importance of ERTs similarly to each other, as well, although some differences are apparent between urban, suburban, and rural programs. Although there are slight differences in the importance of response themes between program management and EMG volunteers, it appears that the EMG volunteer program has an effective organizational structure with an upper and middle management generally aligned at every level. It is plausible that the variability in importance of response themes could be attributed to nuances in local issues and needs. Historical comparison indicates that the importance of ERTs has changed over time, suggesting that themes cycle and change. Although the EMG program does not have a national plan for programming, this assessment of EMG volunteer program ERTs provides a perspective on program direction and a useful starting point for discussion. It is a timely conversation, as EMG programs are increasingly expected to be more accountable and show community impact, and these assessments serve as an important baseline for a national program poised for growth and development.

The EMG volunteer program is one of the most widely recognized programs of extension (Meyer, 2007). It was designed specifically to address the demands of CH, defined as the cultivation, use, and enjoyment of plants, gardens, landscapes, and related horticultural items to the benefit of individuals, communities, and the environment (NICH, 2018). In the United States, it is extension that conducts the training and management of these volunteers, the recommendations provided, and educational programs delivered by EMG volunteers are rooted in university research.

The EMG program proved to be such a vital extension of services for Washington State University that it was rapidly implemented in all 50 states (Allen et al., 2012). Presently, 49 EMG programs are recognized in the United States (Extension Master Gardener National Committee, 2016c). More than 90,000 EMG volunteers reported service hours in 2016, reaching a reported 5.8 million clientele (Extension Master Gardener National Committee, 2017).

Extension Master Gardener programs were originally targeted for development in metro areas to help extension to meet the growing demands for CH information in an increasingly urbanized environment (Boyer et al., 2002). Since their inception, EMG volunteer programs have spread out into suburban and rural areas. Dorn et al. (2018) reported that 80.5% of EMG supported urban EMG programs, whereas 17.2% supported suburban programs and 2.1% supported rural EMG programs.

Early reports of EMG projects indicate that programmatic emphasis was on providing a response to an individual’s inquiry at EMG clinics at major shopping centers, libraries, public gardening events, and county fairs (Warner, 1978). Responding to individual inquiry is a nonformal means of educating the public and, by default, became the primary ERT for EMG volunteers—in other words, how EMG volunteers responded to public request for CH information. Over time, additional ERTs were developed, including both nonformal (organized learning with or without a formal curriculum, taught by a qualified teacher or leader, that results in enrichment and increase in skills and capacities) and informal (nonorganized learning without a formal curriculum, noncredits earned, taught by someone with experience) methods of educating (Eaton, 2018). Multiple horticultural issues were targeted, and volunteer service activities abounded (Fig. 1). Multiple volunteer service activities can be conducted simultaneously, supporting one or more ERTs that address one or more issues, as shown in Figs. 2 and 3. These ERTs support Boyle’s (1981) three types of educational programming, including institutional (developing basic abilities and skills), informational (dissemination of information), and developmental (problem-specific strategies). Programming may ultimately be supported by numerous volunteer service activities to achieve the desired goals and objectives (Seevers et al., 2007).

In a 1994 Virginia study (Relf and McDaniel, 1994), EMG volunteers were asked to prioritize program outreach and to choose from a list of six ERTs. Providing horticultural information to others topped the list of EMG volunteer priorities, followed by changed (improved) behavior; teaching
youth about nature, the environment, and gardening; teaching through demonstration sites; protecting the heritage of historic and public gardens; and enhancing the quality of life for special populations. The same study noticed an evolution in EMG volunteer roles in the first 25 years of the program’s history; early EMG volunteers were primarily “volunteers with gardening answers.” This note of change was echoed by Meyer (2007), who observed that EMGs now fill “a much larger role than what was envisioned when the program started in 1972.”

McAleer (2005) took a snapshot of EMG service projects as performed by state coordinators in the late 1990s. This was an open response question, and replies were grouped into 10 project types that include some ERTs and volunteer service activities. Projects addressing the youth audience topped the list, followed by “one-on-one advice to general public.” These two preferences rose to the top of a list that included established EMG activities involving demonstration gardens, environmental education, community gardens, classes, workshops, speaking engagements, and other topics. These results provided insight into historic EMG program priorities.

As early as 1992, observations indicated that EMG programs were unique with “different emphases and objectives” from county to county and state to state (Stouse and Marr, 1992). Meyer (2007) noted that “MG and extension programs are most effective when the projects meet community needs.” This is consistent with effective program planning that uses needs assessment and priorities to guide the design and implementation of outreach efforts (Seevers et al., 2007). Although local needs guide EMG program outreach at the county and state levels, the overall EMG program impact is not presently guided by vision at the national level.

Before 2015, there were no national standards for EMG volunteer programs, and at this time, there is no official work plan or prioritization of educational programming (Kirsch and VanDuren, 2002; Langellotto et al., 2015). Individual program leaders essentially make their own choices. There are differences of opinion about the appropriateness of hands-on gardening activities as an ERT. What counts for volunteer service varies from county to county within a state and from state to state (Meyer, 2007; Vines et al., 2016). This causes concern for the EMG program image as lack of consistency in the volunteer experience region to region affects the impression of the communities and individuals using the services of EMG volunteers (Allen et al., 2012).

In 2016, a national mission to distinguish and focus on the efforts of EMG programs from other volunteer groups across the country was adopted by the EMG National Committee (EMGNC), a group providing voluntary national leadership to facilitate cooperation, communication, and collaboration among EMG programs nationwide (Extension Master Gardener National Committee, 2016b; Langellotto et al., 2015). This milestone effort established that the mission of EMG programs is to “educate people, engaging them in learning to use unbiased, research-based horticulture and gardening practices through a network of trained volunteers directed and supported by LGU faculty and staff” (Langellotto et al., 2015).

This mission, indeed, aligns with the land grant mission of extension. In fact, according to the dean of the University of Minnesota’s College of Agriculture, one of the key missions of the EMG program is to extend the research and resources of the university farther than the university would otherwise be able to (Allen et al., 2012). The mission of the EMG program could be strengthened by articulating a national strategic plan for outreach, but it is unknown how well such a plan would be received or if it could be effectively implemented.

In the spirit of enhancing cooperation, communication, and collaboration, the EMGNC established six extension programmatic regions in the United States. The regions include Northeast (West Virginia, Pennsylvania, Delaware, New Jersey, Connecticut, New York, Massachusetts, Maryland, New Hampshire, Vermont, Maine, and Rhode Island); North Central (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Minnesota, Wisconsin, Michigan, Illinois, Ohio, and Indiana); Northwest (Washington, Oregon, Idaho, Montana, Wyoming, Alaska, and Hawaii); Southwest (California, Nevada, Utah, Arizona, Colorado, and New Mexico); South Central (Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Kentucky, and Tennessee); and Southeast (Alabama, Georgia, Florida, South Carolina, North Carolina, and Virginia). A representative from each region is a member of the national committee (Extension Master Gardener National Committee, 2016a). Dorn et al. (2018) found significant differences in volunteer demographics on a regional basis, including volunteer age, years of active service, and service reported in 2015. Similarities and differences in regional EMG ERTs, if any, are unknown.

Dorn et al. (2018) noted demographic differences among EMG volunteers in different generations. EMG coordinators and volunteers represent four generations, including traditionalist (born between 1925 and 1942), baby boomer (born between 1943 and 1960), Gen X (born between 1961 and 1981), and Gen Y (born between 1982 and 2000). These cohorts (or generations) have common exposure to social and intellectual conditions, or events, that form the generation’s consciousness (Parry and Urwin, 2011; Rotolo and Wilson, 2004; Strauss and Howe, 1991; Zemke et al., 2000). It is unknown if there are generational differences in importance of ERTs.

The objective of this article was to determine whether state and local program management and volunteers are on the same page with regard to the importance of EMG program ERTs. The effects of region, generation of the respondent, and host county population density on the importance of ERTs were also explored. We will discuss how these results compare with historical program accounts and the implications of these results for addressing federal programming priorities for horticulture.

Materials and Methods

A quantitative national study of current and inactive EMG volunteers and their state and local coordinators in all 49 U.S. EMG programs was conducted in Fall 2016 (University of Georgia Institutional Review Board Approval #3567). Survey protocol was based on Dillman methods for online survey research (Dillman et al., 2014) and published accounts of EMG volunteer survey research (Takle et al., 2016; Vines et al., 2016). The study included three surveys to state coordinators, local coordinators, and EMG volunteers, which built on one another and were conducted consecutively. Survey methodology has been described in detail elsewhere (Dorn et al., 2018).

All responses were labeled for generation cohort, calculated from birth year. Traditionalists included individuals born between 1925 and 1942 (age 74–91 years), baby boomers included individuals born between 1943 and 1960 (age 56–73 years), Gen X included individuals born between 1961 and 1981 (age 35–55 years), and Gen Y included individuals born between 1982 and 2000 (age 16–34 years). Responses were also coded by an extension programmatic region for the purpose of regional analysis.

To describe the population density of the counties served by EMG programs, the 2013 Rural-Urban Continuum Codes (RUCCs) presented by USDA’s Economic Research Service (2013) were used. The RUCCC is a classification scheme that distinguishes metropolitan counties by the population size of their metro area, and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. The RUCCC includes three metro codes (1–3), four nonmetro codes (4–7), two rural codes (8 and 9), and two codes describing unknown areas (88 and 99).

Each county in the United States is assigned one of the 11 codes. For the purpose of this study, the 11 RUCCCs were reduced to four categories, including urban (codes 1–3), suburban (codes 4–7), rural (codes 8–9), and unknown (codes 88 and 99).
To assess program ERTs, Relf and McDaniel’s (1994) original questions were used verbatim with permission (S.T. Dorn and P.D. Relf, personal communication). These six questions were included on the surveys 1, 2, and 3 extended to state coordinators, local program coordinators, and EMG volunteers, respectively. For the sake of space and clarity, short phrases will be used to refer to the six ERTs (Table 1). All participants in the present study were asked to rate the six ERTs on a 5-point Likert scale (1 = extremely important to 5 = not at all important); means were calculated for each theme; and results for current, active EMG volunteers (meeting their state’s requirements for volunteer status) were included in data analysis. Whereas Relf and McDaniel (1994) asked respondents to rank ERTs, this study asked state and local coordinators and EMG volunteers to indicate the importance of each of the six ERTs.

Results of the present study were compared with those of previous studies exploring state coordinator program perspectives, although a meta-analysis was not conducted. For comparison purposes, ERT means were placed in numeric order according to importance, following the 5-point Likert scale (1 = extremely important to 5 = not at all important). Data from the survey were collected using Qualtrics (Qualtrics, Provo, UT) and analyzed using IBM SPSS (version 23 for Windows; IBM Corp., Armonk, NY). Results were analyzed using descriptive statistics and three-way and one-way analysis of variance (ANOVA) where appropriate. Because of unequal variances and unequal group sizes,
the Brown–Forsythe statistic was used to test for significance, followed by the Games–Howell post hoc test to separate means.

Results

Study response rates were strong and are reported elsewhere (Dorn et al., 2018). Four generational cohorts were represented in survey responses to program ERT questions. Most of the state and local coordinators represent Gen X and Gen Y cohorts, whereas most of the EMG volunteers represent baby boomer and traditionalist generations. Regional participation was variable, although all six extension programmatic regions were represented. The weakest participation was in the southwest region, whereas the strongest participation came from the north central region. Reliability as calculated ex post facto for the entire study was 0.827 using Cronbach’s alpha. Reliability was also consistently high across survey response types (0.714 among state coordinator responses, 0.742 among local coordinator responses, and 0.832 among EMG responses).

Three-way ANOVA revealed no significant interaction between the effects of generation, region, and responder types (state coordinator, local coordinator, or EMG volunteer) on the importance of ERTs (Supplemental Table 1). Overall, the generation of the survey participant did not appear to affect the importance of ERTs. No significant differences were detected among the six extension programmatic regions, as participants scored each ERT similarly within the regions. Differences in ERT importance, however, appeared at the responder level.

ERT means by responder. Means for ERTs ranged from $M = 1.3$ to $M = 3.1$ (Table 2). ERT means for local coordinator responses were consistently in between state coordinators and EMG volunteers. When EMG volunteer responses were compared by generation and extension programmatic region, nonsignificant differences were observed. Differences between responder types (state coordinator, local coordinator, and EMG volunteer) were significant for behavior change ($F_{(2, 130.112)} = 4.339, P = 0.015$), demonstration ($F_{(2, 124.047)} = 11.891, P < 0.001$), heritage ($F_{(2, 155.279)} = 51.756, P < 0.001$), and quality of life ($F_{(2, 111.192)} = 15.047, P < 0.001$) ERTs (Table 2).

Comparing state and local coordinator ERT means. State and local coordinators scored ERTs similarly (Table 2). Comparison of means revealed no significant difference in means for five of six ERTs (individual inquiry, behavior change, youth, demonstration, and quality of life). Although heritage had the highest mean (least importance) for both local and state coordinators, the local coordinator mean was significantly different from and less than the respective mean for state coordinator responses ($M = 2.5, SD = 1.20$ and $M = 3.1, SD = 1.03$, respectively) (Table 2). Analysis by generation and extension program region revealed no significant differences in ERT scores by program management. In practical terms, state and local coordinator importance of ERTs is aligned.

Comparing program management and EMG volunteer ERT means. Comparison of ERT importance for program management (state and local coordinators) and EMG volunteers revealed no significant difference for three of six ERTs (individual inquiry, behavior change, and youth) (Table 2). ERT means for program management and EMG volunteers, however, are significantly different for demonstration, heritage, and quality of life. EMG volunteers place a higher importance on the demonstration ERT ($M = 1.7, SD = 0.891$) than state ($M = 2.0, SD = 0.891$) or local ($M = 2.0, SD = 0.891$) coordinators. EMG volunteers place a higher importance on the heritage ERT ($M = 1.9, SD = 1.03$) than local coordinators ($M = 2.5, SD = 1.20$), and scores indicate the heritage ERT is more important to local coordinators than state coordinators ($M = 3.1, SD = 1.03$). EMG volunteers place a higher importance on the quality of life ERT ($M = 2.0, SD = 1.05$) than state ($M = 2.4, SD = 1.05$) and local ($M = 2.3, SD = 0.997$) coordinators.

ERTs by host county population densities. Importance of ERTs to EMG volunteers was analyzed by host county population densities to determine if ERTs were different among urban, suburban, and rural EMG programs (Table 3). EMG responses from urban programs ($M = 1.4, SD = 0.700$) scored individual inquiry as more important than EMG volunteers in suburbia ($M = 1.6, SD = 0.771$) or rural ($M = 1.7, SD = 0.881$) programs. EMG responses from urban programs ($M = 1.6, SD = 0.827$) scored behavior change as more important than EMG volunteers in suburbia ($M = 1.9, SD = 0.865$) and rural ($M = 1.9, SD = 0.936$) programs. ANOVA revealed significant differences in the individual inquiry ($F_{(2, 353.143)} = 21.799, P < 0.001$), behavior change ($F_{(2, 322.499)} = 15.338, P < 0.001$), and demonstration ($F_{(2, 390.005)} = 14.037, P < 0.001$) ERTs, but no difference was observed for youth, heritage, and quality of life ERTs.

Historical comparison. When compared with previous studies, results of the present study suggest that the state coordinators have changed their ERT priorities over time. State coordinators surveyed in the late 1990s have changed their ERT priorities over time. Nearly 20 years later, youth is third in ERT importance on the demonstration ERT ($M = 2.0, SD = 1.05$) and quality of life. EMG volunteers place a higher importance on the heritage ERT ($M = 1.7, SD = 0.881$) and quality of life. EMG volunteers place a higher importance on the demonstration ERT ($M = 1.6, SD = 0.827$) scored behavior change as more important than EMG volunteers in suburbia ($M = 1.9, SD = 0.921$) and rural ($M = 1.9, SD = 0.936$) programs. ANOVA revealed significant differences in the individual inquiry ($F_{(2, 313.143)} = 27.349, P < 0.001$), behavior change ($F_{(2, 322.499)} = 15.338, P < 0.001$), and demonstration ($F_{(2, 390.005)} = 14.037, P < 0.001$) ERTs, but no difference was observed for youth, heritage, and quality of life ERTs.
When compared with previous studies, the present study suggests there is little change in ERT importance for EMG volunteers. The most important ERT in the 1990s was individual inquiry (Relf and McDaniel, 1994), which remains consistent with the top ERT of EMGs in the present study. Similarly, the importance of demonstration, heritage, and quality of life remains in the same order today as they did more than 20 years ago. ERTs one, four, five, and six remain in the same order 22 years later. ERTs two and
three have switched order. However, there is a slight difference in the order of importance for behavior changes and youth. Present-day EMG volunteers indicate in this study that teaching youth to respect nature and the environment through gardening is of more importance than behavior change of individuals with emphasis on environmentally sound practices.

Comparisons to current data suggest that concurrence between volunteer management and program participants is improving. In historic accounts, program management (state and local coordinators) and program participants (EMG volunteers) have shared only one similarly ordered ERT, behavior change as the second most important ERT. There is great similarity (four similarly ordered ERTs) between the 1994 Virginia EMG order of ERTs and present-day state coordinator ERT order. Regardless, individual inquiry, behavior change, and youth have remained the top three ERTs over time, whereas demonstration, heritage, and quality of life initiatives have remained the bottom three.

Discussion

Response to individual inquiry is consistently of highest importance for EMG programs, regardless of position within the program (management or volunteer). It is interesting to note, however, that there is a wider spread in ERT means for state coordinators \( M = 1.3–3.1 \) than for local coordinators \( M = 1.4–2.3 \) or EMG volunteers \( M = 1.5–2.0 \) (Table 2). This narrow range of means for EMG volunteers suggests that they see all ERTs as equally important, whereas state coordinators, seeing a bigger picture, indicate differences in ERT importance. Local coordinator ERT means are clearly in the middle. This offers a point of caution to local coordinators who allow EMG volunteers to determine program direction and scope. Although program coordinators at the local and state levels depend on volunteers to be aware of local issues and needs to expand extension outreach and encourage volunteer engagement in program planning (DiNardo, 2007; Edmonds et al., 2017; Savanick and Blair, 2005; Sellmer et al., 2003; Strong and Harder, 2011), volunteer-championed efforts may be short-lived because of turnover, may outlive usefulness to extension because of popularity among volunteers, or may be too broad and varied to achieve measurable and significant impact. EMG volunteer and local coordinator contributions to EMG program focus are recognized and valued by state coordinators and the EMGNC, although state coordinators tend to be conceptually ahead of local coordinators and EMG volunteers in addressing programmatic direction (S.T. Dorn and N.R. Bumgarner, personal communication).

Coordinators looking to attract younger volunteers to the EMG program could consider ERTs of interest to EMGs of different generations (Supplemental Table 2). Although analysis of ERTs by generation of coordinators and EMG volunteers did not reveal significant differences among cohorts, generational considerations should not be ignored. Particular attention should be paid to interests of Gen X and Gen Y that represent future volunteer cohorts.

Slight differences in ERT scores may be reflective of nuances in local issues and needs. For example, consider demonstration and heritage. These ERTs were consistently scored lower in importance and with most variability. Projects supporting these ERTs are perhaps more subject to local influence (i.e., critical local stakeholders make requests for extension services and a local coordinator deems the project important for visibility or relationship reasons). For this reason, they may be of higher importance at the local level (EMG volunteers and local coordinator) than at the state level (state coordinator). At the same time, differences in these ERTs may also reflect differences in program policies from state to state regarding suitable volunteer service projects and programming. For example, hands-on gardening is approved for volunteer service in some areas and discouraged in others. Local and regional differences should be expected with EMG programs and are cited repeatedly in literature (McAleer, 2005; Meyer, 2007; Stouse and Marr, 1992).

Local-level influence is also seen in comparisons of ERTs by host county population density. When examining at urban, suburban, and rural programs, the means of three ERTs were significantly different. Responding to individual inquiry is an important ERT for urban areas where demand for information is higher per capita. In fact, in urban areas, it is very common to see a volunteer service requirement for office space/help desks/phone line/etc. (Meyer, 2007). ERTs that can be volunteer service intensive, such as demonstration or heritage, may be slightly less important to suburban and rural EMG programs, which tend to be smaller in scope (Meyer, 2007) with fewer volunteers.

Similarly, state-level ERTs may also influence program ERTs. For example, Texas is the originator of the Junior Master Gardener curriculum for youth. If a state EMG program has invested in the development of specific programming, such as youth horticulture, there may well be state-level mandates, strategic collaborations, or even external funding that may drive that program and elevate the importance of the ERT.

Discussion of ERTs on regional and national levels provides opportunity to identify program gaps and directions for program expansion. An example of this is the issue of food security (Fig. 3). When asked if there are other EMG program ERTs in addition to the six included in this study, state and local coordinators attending a July 2017 meeting at the International Master Gardener Conference could not identify other ERTs, but instead identified food security as an “emerging issue” (Dorn and Schrock, 2017). “Low-income projects” appeared on McAleer’s (2005) list, selected more times than gardening with an educational focus (comparable to demonstration) and noneducational projects (comparable to heritage). When EMG volunteers responded to an open-ended question about future improvements for their respective state EMG program, 16 of 81 ERT-related comments indicated the importance of addressing food security through gardening (Supplemental Fig. 1). The results of current efforts to address food security needs with EMG volunteer leadership at the county and state level are currently being evaluated (Khadiagala et al., 2018). Areas of emphasis may change with time, as do ERTs. It is essential that long-term programmatic focus needed to be “flexible enough” to account for changing county- and state-level needs (McAleer, 2005).

The original intention of the EMG program was simply to answer gardening questions from the noncommercial public, and that remains the most important ERT for program management and volunteers. EMG programs and their volunteer service projects were developed to meet the growing demands for consumer horticultural information in an increasingly urbanized environment. The initial role of response to individual inquiry remains a huge need and top priority for extension and EMG programs. Extension’s ability to meet public needs for CH relies heavily on volunteer staff, also known as EMG volunteers (Bewick, 2017; McAleer, 2005; Meyer, 2007). Now, EMG volunteers are meeting the criteria for paraprofessional extension educators (Chlipalski et al., 2018), participating in significant and continuous training [on average, 40 h initially (EMG National Committee, 2016b) and 7.75 h or more annually (EMG National Committee, 2017)] that addresses content, organizational rules, and terminology relevant to CH. EMG volunteers are capable of performing tasks once performed exclusively by extension educators and agents (Meyer, 2007).

The results clearly demonstrate that ERTs can be transmitted from level to level within the program. This is useful for supporting a national strategic plan. Although the EMG program does not presently have a national set of initiatives or a strategic plan, this assessment of EMG volunteer program ERTs provides perspective on program direction and is a useful starting point for discussion. It does appear that these ERTs are relevant (no individual ERT received a mean score higher than 3.1, with 5 indicating least important). Although the ERTs explored in this study may not be the exclusive ERTs on which EMG programs should be focused, they have been documented to have remained viable and important through time and do provide a place to begin a conversation about a national strategic plan.

In fact, the results suggest that the EMG volunteer program has an effective organizational structure with an upper and middle management. Program ERTs appear to be generally aligned at every level, including the
program participant level (EMG volunteers). This is remarkable, given that 35 state coordinators, an estimated 1534 local coordinators (Dorn et al., 2018), and more than 90,000 volunteers nationally (Extension Master Gardener National Committee, 2017) operate without a strategic plan or paid national leadership. Although the reason for this high level of alignment is not readily apparent, it may be a result of the rapid establishment of EMG programs within states, closely modeled from state to state. In addition, EMG volunteers have a higher average tenure with the MGEV program than state and local coordinators (Dorn et al., 2018), offering a source of institutional knowledge and long-term maintenance of outreach efforts. In vernacular, if program management and volunteers are not on the exact same page, it is fair to say they are at least in the same chapter.

In addition to capturing a historical perspective on EMG programming, these results suggest the possibility of aligning EMG program ERTs with horticulture program area priorities of the USDA NIFA. USDA NIFA’s horticulture initiatives speak directly to CH, including environmentally sensitive management of landscape plantings and gardens and horticultural impacts on human health and well-being, such as social, mental, and physical horticultural therapy (USDA NIFA, 2017). Ideally, EMG volunteer program ERTs should meet local issues and needs (Meyer, 2007) and align with the priorities of extension’s federal stakeholder, USDA NIFA. Some ERTs align more easily than others. It is easy to accept the alignment of teaching environmentally sensitive gardening methods through traditional methods of written communication and presentation. It is harder to move NIFA strategies forward through demonstration and heritage ERTs, although examples demonstrate that they can be used effectively to teach timely topics, such as growing food for personal use (Edmonds et al., 2017). In addition, the quality of life ERT allows the EMG program to address the needs of special populations specifically mentioned by NIFA’s therapeutic horticulture initiatives. It only makes sense that ERTs for EMG outreach should align with local issues and needs within a state extension framework set to respond to the initiatives of its federal stakeholder, USDA NIFA.

Further study and understanding is merited to ensure that programmatic emphasis considered critical by NIFA is not left unaddressed by EMG educational programming. Differences in ERT importance may be a reflection of differences among states between educational priority and educational methods. In addition, opportunities could be identified for state and local coordinators as well as EMG volunteers to contribute to NIFA’s priority assessment and planning processes for the horticulture program area.

When focus does not align internally or externally, the risk of mission drift threatens the local EMG program. When there is no or limited extension leadership and funding, volunteers will operate programs on their own terms and understandings. These results show a small difference in the numerical ordering of ERTs between EMG volunteers and state and local coordinators, and a slight dissonance between program management and volunteers appears in negative EMG volunteer comments about program rules and bureaucracy that were responses to an open-ended question about future directions for the EMG program (50 of 707 comments, or 7.1% of responses, Supplemental Fig. 1). Although seemingly not a high percentage at this time, proactive efforts will ensure that program ERTs are consistent and properly aligned at every level so that high fidelity of program mission is preserved.

When focus does align internally and externally, many benefits abound. There is increasing emphasis on collaboration, both within state, regional, and national circles. Pooling of resources, such as online EMG trainings offered through extension (Jeanette and Meyer, 2002; Vines et al., 2016), has already created an example of the potential to extend and maximize resources when states and specialists collaborate. Knowing program management and participants are on the same page or working toward shared goals, whether at the state level, regionally, or nationally, is essential to increasing collaborations. Future success of the EMG program depends on an aligned focus (Meyer, 2007).

Understanding differences among program ERTs is a positive step for tapping the tremendous capacity of EMG programs. An early estimate indicated that nearly 17 million people have contact with an EMG volunteer annually (Meyer, 2007). The most recent national EMG summary suggests that EMG volunteers had more than 5.8 million in-person contacts and had a media reach of 8.1 million in 2016 (Extension Master Gardener National Committee, 2017). EMGs have been able to reach far more people than extension educators or specialists (Meyer, 2007), and EMG volunteers are the “foot soldiers for CH” (S.T. Dorn and L. Khadiagala, personal communication). In his 11 July 2017 welcoming address at the International Master Gardener Conference in Portland, OR, Dr. Tom Bewick, USDA NIFA’s horticulture program leader, stated that “[Extension Master Gardeners] are critical to making USDA, in the words of Abraham Lincoln, the ‘People’s Department’” (Bewick, 2017). Indeed, extension’s ability to meet public needs for CH relies heavily on volunteer staff (McAleeer, 2005; Meyer, 2007), and the EMG volunteer program has the potential to provide “the largest direct contact service within the Cooperative Extension Service” (McAleeer, 2005). CH programming generates as many or more contacts for extension than other production-focused program areas (Bradley et al., 2017).

Continued assessment of critical horticultural issues helps to keep the EMG program aligned with community and organizational needs, and ERTs offer a strategy for effective public education by EMG volunteers. Educational projects and outreach need to be valued by and relevant to extension, EMG volunteers, and communities alike. As coordinators and volunteers work together, following USDA NIFA’s lead, the EMG program teaches consumers about environmentally sensitive management of landscape plantings and gardens so that the positive impacts of horticulture on human health and well-being are accepted and practiced by society at large. To fully tap the capacity of the EMG volunteer program, there is a need for a national programming plan that includes aligned focus and sound evaluation of program impacts. Results indicate that there may be sufficient internal alignment to support a national-level strategic plan, complete with identified horticultural issues, ERTs, and volunteer service activities aligned from the grass roots to the federal level.

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Supplemental Table 1. Three-way analysis of variance for effect of generation, region, and responder type on importance of six educational-response themes (ERTs) for the Extension Master Gardener program.

| ERT                  | Sum of squares | df  | Mean square | F value | P value |
|----------------------|----------------|-----|-------------|---------|---------|
| **Individual inquiry** |                |     |             |         |         |
| Responder           | 0.164          | 2   | 0.082       | 0.161   | 0.851   |
| Region               | 3.622          | 5   | 0.724       | 1.425   | 0.212   |
| Generation           | 0.881          | 3   | 0.294       | 0.577   | 0.630   |
| Generation × region  | 5.424          | 10  | 0.542       | 1.067   | 0.384   |
| Region × responder   | 2.202          | 5   | 0.440       | 0.866   | 0.503   |
| Responder × generation | 12.066        | 15  | 0.804       | 1.582   | 0.070   |
| Region × responder × generation | 10.442 | 16  | 0.653       | 1.284   | 0.197   |
| Error                | 2,855.735      | 5,618 | 0.508     |         |         |
| **Behavior change**  |                |     |             |         |         |
| Responder           | 2.437          | 2   | 1.218       | 1.776   | 0.169   |
| Region               | 5.146          | 5   | 1.029       | 1.500   | 0.186   |
| Generation           | 0.611          | 3   | 0.204       | 0.297   | 0.828   |
| Generation × region  | 2.859          | 10  | 0.286       | 0.417   | 0.939   |
| Region × responder   | 4.706          | 5   | 0.941       | 1.372   | 0.231   |
| Responder × generation | 9.280         | 15  | 0.619       | 0.902   | 0.562   |
| Region × responder × generation | 7.353 | 16  | 0.460       | 0.670   | 0.826   |
| Error                | 3,790.574      | 5,526 | 0.686     |         |         |
| **Youth**            |                |     |             |         |         |
| Responder           | 0.148          | 2   | 0.074       | 0.118   | 0.889   |
| Region               | 3.796          | 5   | 0.759       | 1.204   | 0.304   |
| Generation           | 0.280          | 3   | 0.093       | 0.148   | 0.931   |
| Generation × region  | 3.312          | 10  | 0.331       | 0.525   | 0.873   |
| Region × responder   | 0.693          | 5   | 0.139       | 0.220   | 0.954   |
| Responder × generation | 10.752        | 15  | 0.717       | 1.137   | 0.316   |
| Region × responder × generation | 5.741 | 16  | 0.359       | 0.569   | 0.909   |
| Error                | 3,476.929      | 5,515 | 0.630     |         |         |
| **Demonstration**    |                |     |             |         |         |
| Responder           | 8.692          | 2   | 4.346       | 5.459   | 0.004*  |
| Region               | 2.319          | 5   | 0.464       | 0.583   | 0.713   |
| Generation           | 1.273          | 3   | 0.424       | 0.533   | 0.660   |
| Generation × region  | 8.568          | 10  | 0.857       | 1.076   | 0.377   |
| Region × responder   | 2.774          | 5   | 0.555       | 0.697   | 0.626   |
| Responder × generation | 14.041        | 15  | 0.936       | 1.176   | 0.283   |
| Region × responder × generation | 17.937 | 16  | 1.121       | 1.408   | 0.127   |
| Error                | 4,377.873      | 5,499 | 0.796     |         |         |
| **Heritage**         |                |     |             |         |         |
| Responder           | 30.290         | 2   | 15.145      | 14.476  | 0.000*  |
| Region               | 8.246          | 5   | 1.649       | 1.576   | 0.163   |
| Generation           | 4.786          | 3   | 1.595       | 1.525   | 0.206   |
| Generation × region  | 9.608          | 10  | 0.961       | 0.918   | 0.515   |
| Region × responder   | 3.855          | 5   | 0.771       | 0.737   | 0.596   |
| Responder × generation | 18.732        | 15  | 1.249       | 1.194   | 0.268   |
| Region × responder × generation | 15.256 | 16  | 0.953       | 0.911   | 0.556   |
| Error                | 4,593.560      | 5,442 | 1.046     |         |         |
| **Quality of life**  |                |     |             |         |         |
| Responder           | 11.656         | 2   | 5.828       | 5.322   | 0.005*  |
| Region               | 1.909          | 5   | 0.382       | 0.349   | 0.883   |
| Generation           | 1.954          | 3   | 0.651       | 0.595   | 0.618   |
| Generation × region  | 11.037         | 10  | 1.104       | 1.008   | 0.434   |
| Region × responder   | 6.367          | 5   | 1.273       | 1.163   | 0.325   |
| Responder × generation | 19.270        | 15  | 1.285       | 1.173   | 0.285   |
| Region × responder × generation | 24.158 | 16  | 1.510       | 1.379   | 0.142   |
| Error                | 5,822.645      | 5,317 | 1.095     |         |         |

*Significant at \( P < 0.05 \); **significant at \( P < 0.001 \).
Supplemental Table 2. One-way analysis of variance of Extension Master Gardener volunteer educational-response themes (ERTs) by generations.

| ERT               | Generation*     | N      | Mean (SD)y   | df | F value* | P value |
|-------------------|-----------------|--------|--------------|----|----------|---------|
| Individual inquiry| Traditionalist  | 738    | 1.4 (0.667) NS | 3  | 0.516    | 0.672   |
|                   | Baby boomer     | 3,776  | 1.4 (0.722) NS |    |          |         |
|                   | Gen X           | 599    | 1.5 (0.712) NS |    |          |         |
|                   | Gen Y           | 43     | 1.6 (0.845) NS |    |          |         |
| Behavior change   | Traditionalist  | 727    | 1.6 (0.840) NS | 3  | 0.820    | 0.484   |
|                   | Baby boomer     | 3,714  | 1.6 (0.824) NS |    |          |         |
|                   | Gen X           | 587    | 1.6 (0.900) NS |    |          |         |
|                   | Gen Y           | 43     | 1.7 (1.01) NS  |    |          |         |
| Youth             | Traditionalist  | 721    | 1.5 (0.807) NS | 3  | 0.584    | 0.625   |
|                   | Baby boomer     | 3,705  | 1.5 (0.799) NS |    |          |         |
|                   | Gen X           | 590    | 1.5 (0.778) NS |    |          |         |
|                   | Gen Y           | 42     | 1.5 (0.890) NS |    |          |         |
| Demonstration     | Traditionalist  | 724    | 1.7 (0.938) NS | 3  | 0.687    | 0.561   |
|                   | Baby boomer     | 3,684  | 1.7 (0.882) NS |    |          |         |
|                   | Gen X           | 592    | 1.8 (0.912) NS |    |          |         |
|                   | Gen Y           | 42     | 1.8 (0.993) NS |    |          |         |
| Heritage          | Traditionalist  | 711    | 1.9 (1.00) NS  | 3  | 2.095    | 0.099   |
|                   | Baby boomer     | 3,657  | 2.0 (1.02) NS  |    |          |         |
|                   | Gen X           | 587    | 2.0 (1.08) NS  |    |          |         |
|                   | Gen Y           | 42     | 2.0 (0.975) NS |    |          |         |
| Quality of life   | Traditionalist  | 691    | 2.0 (1.04) NS  | 3  | 0.163    | 0.921   |
|                   | Baby boomer     | 3,577  | 2.0 (1.05) NS  |    |          |         |
|                   | Gen X           | 574    | 2.0 (1.08) NS  |    |          |         |
|                   | Gen Y           | 41     | 2.0 (1.17) NS  |    |          |         |

*Traditionalist (age 74–91 years), baby boomer (age 56–73 years), Gen X (age 35–55 years), and Gen Y (age 16–34 years).

yMeans separated by the Games–Howell post hoc test. Means followed by the same letter are not significant from each other.

xThe Brown–Forsythe ratio used to allow for unequal variances and group sizes.

*Significant at $P < 0.05$; **significant at $P < 0.001$. 
Supplemental Fig. 1. Extension Master Gardener (EMG) volunteers were asked to identify needs for future improvement of the EMG program. Fifteen response categories were identified from the 754 responses to the open-ended question. Percentages of responses related to each category were calculated.