Extension Education Methods

Extension Master Gardener Volunteers of the 21st Century: Educated, Prosperous, and Committed

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Summary. This present quantitative study documented the demographic base of 21st century Extension Master Gardener (EMG) volunteers in the United States. As the EMG program approaches its fifth decade and momentum builds for national leadership, collaborative programming, and innovative impact reporting, it is important to understand the characteristics of the current volunteers and their coordinators. A national study of EMG coordinators and volunteers was conducted in Fall 2016. Response was strong, representing 71.4% of state programs and 7498 volunteers. Responding state coordinators are primarily white females, have a mean age of 51.2 years, and have served in their position an average of 7.2 years. Most state coordinators (94.1%) have a graduate degree (master's or higher). Responding local coordinators are primarily white females, have a mean age of 51.9 years, and have served in their position 7.5 years. Some local coordinators (57.4%) have a graduate degree (master's or higher). EMG volunteers responding were primarily female, white, educated, retired, and of economic means; have a mean age of 64.8 years; and have served an average of 7.7 years. Four generations [Traditionalist (born 1925–42), Baby Boomer (born 1943–60), GenX (born 1961–81), and GenY (born 1982–2000)] were represented in survey responses. EMG volunteers were 14.5% Traditionalists, 73.2% Baby Boomers, 11.5% GenX, and 0.9% GenY. There were significant differences in the age, age at initial training, years of active service, and service hours reported in 2015 (the prior complete program cycle) among four generations of EMG volunteers. Responses from EMG volunteers and their coordinators represented all six extension programmatic regions established by the EMG National Committee. Significant differences in age, years of service, and number of volunteer service hours reported in 2015 exist among EMG volunteers across extension programmatic regions. The majority of EMG volunteers responding to the survey indicated they volunteered in an urban county (80.5%), whereas 17.2% of respondents served in a suburban county and 2.1% were connected with rural counties. There were no significant differences in the average age, years of service, and number of volunteer service hours reported in 2015 for EMG volunteers in urban, suburban, and rural programs. Historical data and the present study share similar trends within demographics, including age, income, gender, education, and race/ethnicity, yet offer important considerations for future program growth and development.

Extension Master Gardener volunteer programs have been in existence in the United States since 1972, in Canada since 1985, and in South Korea since 2011 (Wonsuk and Durham, 2015). There are active programs in 49 states (Massachusetts does not have an EMG program). Recruitment, training, and management of potential and returning volunteers have changed minimally since the program's inception (Gibby et al., 2008).

Originally, EMG programs targeted urban areas, where call volume exceeded extension staff capacity to respond. Over the years, the EMG program has spread into less densely populated suburban and rural areas. It remains to be determined if demographic characteristics of the volunteers change with the population density of the host county.

In most cases, leadership for EMG programs is provided by a local EMG coordinator, usually an extension agent or program support staff, at the county level. Local coordinators usually are supported by a state EMG coordinator who provides the statewide direction and leadership. National direction comes from a voluntary Extension Master Gardener National Committee (2016), comprising state and local coordinators from across the United States who serve for a designated term.

In 2006, the EMG National Committee established six programmatic regions in the United States: Northeast (West Virginia, Pennsylvania, Delaware, New Jersey, Connecticut, New York, Massachusetts, Maryland, New Hampshire, Vermont, and Maine), 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) (Fig. 1). The programmatic regions were created to facilitate cooperation, communication, and collaboration among EMG programs nationwide (Langellotto et al., 2015). Demographic similarities or differences, if any, among EMG volunteers, coordinators, and programs within extension programmatic regions are currently unknown.

Understanding the composition of the EMG volunteer base is

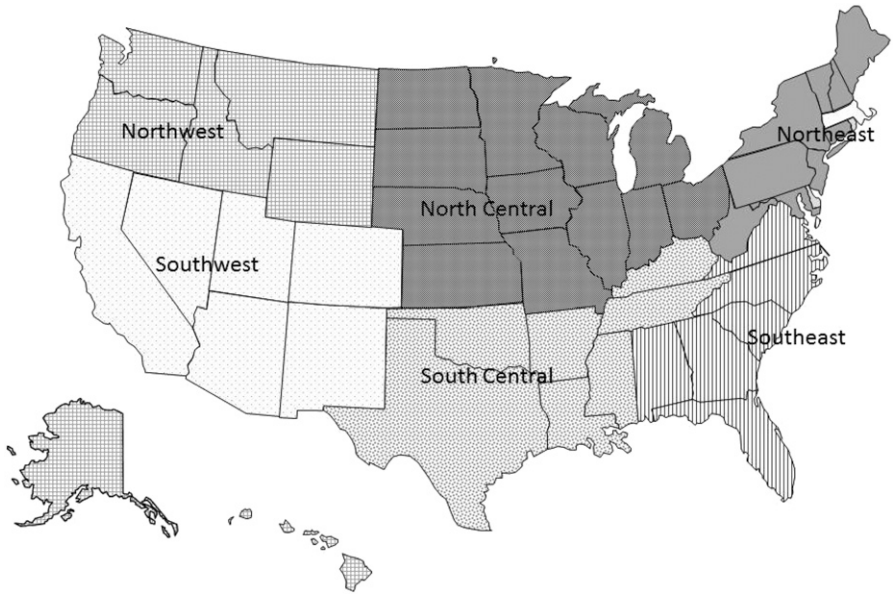

Fig. 1. There are six extension programmatic regions for Extension Master Gardener (EMG) programs in the United States. These regions were designated in 2006 by the EMG National Committee to facilitate cooperation, communication, and collaboration among EMG programs nationwide. EMG programs exist in all states except Massachusetts, where leadership for Master Gardeners is not provided by extension.

important for long-term growth and development of the program. Knowledge of volunteer demographics can influence recruitment and training approaches. It can suggest who will be drawn to the program and how training can be effectively delivered. It also has implications for volunteer placement, such as the ability to fill gender-specific roles and volunteer availability for service opportunities. Meyer (2007) suggests that demographic data are critical elements for determining any possible impact or effect of EMG volunteers on a national level.

State-based EMG studies show that EMG programs have historically appealed to an older demographic of 50+ years (Boyer et al., 2002; Kirsch and VanDerZanden, 2002; Relf and McDaniel, 1994; Rohs and Westerfield, 1996; Ruppert et al., 1997; Schrock et al., 2000; Strong and Harder, 2010; Takle et al., 2016; Wilson and Newman, 2011). At inception, the EMG program was targeted at nonworking individuals who had the necessary time for program commitments. In the 1970s, this included individuals who were not in the workforce as well as retirees.

Early studies reported most of the EMG volunteers in the 0–5 years of service bracket (Boyer et al., 2002; Kirsch and VanDerZanden, 2002; Relf and McDaniel, 1994; Schrock et al., 2000). With the increasing longevity of the program, volunteers may serve longer, reflecting continued long-term commitment to the program.

Whereas numerous individual state-level studies of EMG volunteers have been performed, few national studies have been attempted. Thirteen years ago, McAleer (2005) published a report of EMG programs including total current EMG volunteers, number of volunteers trained, annual volunteer hours, and contacts, as well as issues and challenges related to coordinating and managing programs. McAleer derived data from a survey sent via postal mail to 48 state coordinators, of which 42 returned the survey. No data were directly collected from local coordinators or EMG volunteers.

In 2009, an abbreviated second national EMG report was compiled from 42 states and the District of Columbia (Cooperative State Research, Education, and Extension Service, 2009). This report estimated the current number of volunteers and hours reported, indicating that 79% of volunteer hours were connected with metropolitan counties and 21% of volunteer hours were connected with rural counties (as defined by the Office of Management and Budget). No data were directly collected from local coordinators or EMG volunteers.

National reports monitoring similar program metrics were also compiled for 2014 and 2016, using online surveys sent to state coordinators by representatives of the Extension Master Gardener National Committee (2015, 2017). Similar to previous data collection methods, responses were sought from individuals working closely with the program when a state was without a state coordinator. No data were directly collected from local coordinators or EMG volunteers.

The first national study that collected information directly from local coordinators and EMG volunteers was focused on the use of social media for EMG programming purposes. Vines et al. (2016) distributed a Qualtrics (Provo, UT) survey to EMG coordinators through the eXtension listserv with encouragement to also distribute to EMG volunteers in their states. Responses were obtained from 111 state and local coordinators (respective counts not published) and 1275 EMG volunteers in 22 states (Vines et al., 2016). This study was unique in its inclusion of local coordinators and EMG volunteers. Although it captured demographic data about program coordinators, state and local coordinator responses were not differentiated. Information collected from EMG volunteers focused primarily on social media use. Vines et al. (2016) reported that state coordinators provided effective survey distribution and participation.

Generational differences are an important consideration for volunteer programs. Described as differences in behavior from one generation

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to the next that are attributed to differences in values and attitudes (Parry and Urwin, 2011; Rotolo and Wilson, 2004; Strauss and Howe, 1991; Zemke et al., 2000), generational experiences may affect the inclination to serve vs. the need to work, as well as other factors affecting volunteerism, such as affinity for particular tasks, ability to fill specific roles, willingness or ability to work after dark, or adoption of technology (Rotolo and Wilson, 2004).

This is the first study to explore generational difference among EMG volunteers. The EMG program was originally designed to appeal to the Traditionalist generation (born between 1925 and 1942) when the program was developed in the 1970s. In the present study, generational groups are defined as Traditionalists (born between 1925 and 1942), Baby Boomers (born between 1943 and 1960), Generation X (born between 1961 and 1981), and Generation Y (born between 1982 and 2000) (Parry and Urwin, 2011; Rotolo and Wilson, 2004; Strauss and Howe, 1991; Zemke et al., 2000). It remains to be determined if today's EMG program appeals to all generations.

Two state studies have reported that the EMG volunteers are predominantly white, older, female, educated, and affluent—a remarkably homogeneous group (Schrock et al., 2000; Strong and Harder, 2010), but the demographics of the volunteers has not been assessed nationwide. Ensuring the diversity of EMG programs has been a persistent challenge (Eichberger et al., 2014). Typical trends in volunteering include more women than men [volunteering seen as a woman's role (Rotolo and Wilson, 2004)], high education levels associated with volunteers (Rotolo and Wilson, 2004; U.S. Bureau of Labor Statistics, 2016), and a predominance of whites (U.S. Bureau of Labor Statistics, 2016).

Of further challenge to the EMG program is the well-documented preference of volunteers for episodic, or short-term, volunteer opportunities (Blair et al., 2003; Corporation for National and Community Service, 2016; Graff, 2001). Finding individuals to fulfill the considerable volunteer commitment consistent with the EMG volunteer experience may become increasingly difficult if potential volunteers have a preference for short-term engagements. The EMG program requires a willingness and ability to meet a significant time commitment for training and ongoing projects that span years, if not decades. Commitment to the program is reflected in the number of years an individual has been actively volunteering and meeting program requirements (volunteer service) and the number of volunteer service hours reported in 2015 (the previous complete program and reporting cycle).

The present study of EMG volunteers and coordinators allows in-depth analysis of national, regional, state, and local demographics. The results will help identify trends and influences that may shape the direction of future program priorities.

Materials and methods

SURVEY INSTRUMENT AND DISTRIBUTION. 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 IRB Approval #3567). Survey protocol was based on Dillman's 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). Precedence for distributing a survey in both paper format and via Internet was set by Stukas et al. (2009), who noted that age was the primary difference in respondents using these two methods.

The study included three separate surveys that built on one another and were conducted consecutively (Fig. 2). For state-level information about the EMG program and its state coordinator, Survey 1 (23 questions) was sent via e-mail to 56 e-mail addresses representing 47 states (as published on the eXtension website in Sept. 2016). It asked permission to share the study survey with local coordinators and EMG volunteers in the state. To reach states operating without a state coordinator and provide opportunity for all state EMG programs to participate, the survey was promoted through existing communication chains, including the 2016 EMG Coordinators' Conference in Montana; through the EMG Coordinators' listservs coordinated by eXtension; and in the Sept., Oct., and Nov. 2016 editions of the EMG Coordinators' eBlast newsletter e-mail. In previously published survey methodology for this audience, individuals working closely with the program (i.e., interim coordinators and designated staff) provided state EMG program data in lieu of a state coordinator when EMG programs were operating without a state coordinator (i.e., Arizona had four contacts listed on the program contact page for eXtension).

Survey 2 (21 questions) was sent via e-mail to local program coordinators (precise number is unknown) by

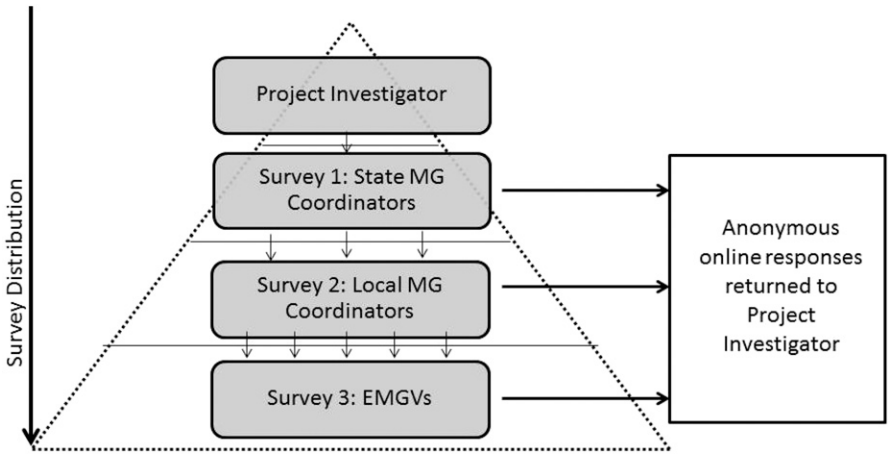

Fig. 2. Protocol for the 2016 national study of Extension Master Gardener (EMG) volunteers (EMGVs) and their Master Gardener coordinators used existing EMG program structure for survey distribution. Surveys 1, 2, and 3 and subsequent reminders were distributed via an existing hierarchy of state and local coordinators and EMGVs. Use of an online survey tool allowed for anonymous responses to be returned to the project investigator.

the participating state coordinators. It gained information about local coordinators and established their consent to share Survey 3 with EMG volunteers reporting directly to them.

Survey 3 was sent via e-mail to EMG volunteers by participating local coordinators. This survey contained five sections, including EMG volunteer background and experience, reasons for volunteering, benefits from volunteering as an EMG, EMG volunteer activities, and demographic information. Questions were drawn from previous studies and existing survey instruments (Clary et al., 1998; Houle et al., 2005; Relf and McDaniel, 1994; Stukas et al., 2009; Takle et al., 2016) with permission from authors (S.T. Dorn and B.J. Houle, personal communication; S.T. Dorn and P.D. Relf, personal communication; S.T. Dorn, D.S. Schrock, and C. Haynes, personal communication; and S.T. Dorn, A.A. Stukas, and E.G. Clary, personal communication). The entire survey instrument included 168 questions organized in five sections.

Volunteer demographics gathered in the present study included gender, race/ethnicity, year of birth, marital status, child status, current employment status, income range, and level of education. Several questions captured the individual's training year, number of years of active service with the program, the county in which the individual volunteered, and the number of volunteer service hours reported in 2015 (the most recent full program year).

To document EMG programs by population size of the host county, this study uses the 2013 Rural-Urban Continuum Codes (RUCC) presented by the U.S. Department of Agriculture's Economic Research Service (2013) to describe the counties in which EMG volunteers serve. RUCC 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 RUCC 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 RUCC codes were reduced to four categories, including urban (codes 1–3), suburban (codes 4–7), rural (codes 8–9), and unknown (codes 88 and 99).

Active and inactive EMG volunteers were surveyed. Active EMG volunteers are those individuals who have completed an established state EMG training curriculum and are completing required volunteer service hours (40 h minimum in the training year and 20 h minimum in subsequent years) (Langellotto et al., 2015). Inactive EMG volunteers are those individuals who have completed required training and volunteer service, but have not reported active volunteer service in the previous 1 or 2 years.

The EMG survey instrument was tested for validity and reliability by three counties in Georgia (urban, suburban, and rural) before initiating the national study. It was sent via e-mail by the state coordinator to three local coordinators, who then e-mailed the survey to their active and inactive EMG volunteers. Results of the pilot test were used to modify the survey instrument before launching the national survey.

The Qualtrics surveys were administered between 3 Oct. and 14 Nov. 2016, through the existing framework of State and local EMG program coordinators, as identified via eXtension's official list of state EMG program coordinators (Extension Master Gardener National Committee, 2016). An introductory e-mail from the researcher introducing and legitimizing the survey was sent to state coordinators in late September, asking them to introduce the survey to their local coordinators and EMG volunteers using the distribution protocol outlined previously and in Fig. 2. This first introductory message about the study was followed 1 week later by another e-mail containing the actual survey links. The surveys remained open for 2 months, with follow-up e-mails sent at weeks 2, 4, and 6. Anonymous responses to the surveys were returned directly to the project investigator. In response to individuals and coordinators indicating challenges with the online format (10–15 per notice sent), a PDF of the survey document was distributed via e-mail with the week 6 reminder, including instructions to print and complete locally and return by postal mail.

Statistical analysis and data interpretation. The resulting nonrandom convenience sample (a nonprobability sample that is easy to reach, such as a defined set of volunteers) was composed of people who received and responded to the survey links. In 2015, state coordinators reported 83,389 EMG volunteers in the United States (Extension Master Gardener National Committee, 2015). Responses to the present study were expected to meet or exceed the 1097 responses required for a desired precision rate of ±3% and a confidence interval of 95% for $P = 0.5$ (Meier et al., 2015). IBM SPSS (version 23 for Windows; IBM Corp., Armonk, NY) was used to analyze responses through the generation of descriptive statistics and analysis of variance (ANOVA). Although state and local coordinators are described demographically herein, ANOVA is primarily focused on EMG volunteers. Where significant, means were separated using Tukey's and Games–Howell post hoc tests. Chi-square tests were used to compare nominal variables. When there were less than five expected counts per cell, a Monte Carlo test of exact fit was used.

Results

Survey response rates. Survey 1 (state coordinators) received 97 online responses, including 49 incomplete responses that were discarded. For the five states represented by more than one response, the most complete response per state was analyzed ($n = 35$). A state-level response was collected for 35 of 49 recognized EMG programs in the United States (71.4%) (Table 1).

Survey 2 (local coordinators) received 414 total responses, including 124 incomplete responses that were discarded. The remaining 290 online responses from local coordinators represented 29 states. An 18.9% response rate for local coordinators was estimated from the number of local programs provided by state coordinators (assuming that each local EMG program has a local coordinator) (Table 1).

Survey 3 (EMG volunteers) was opened or started by more than 9000 individuals; however, only responses of completed surveys were included in the analysis ($n = 7498$) (Table 1). This represents a 9.75% response rate from the estimated number of EMG volunteers

Table 1. State, local, and volunteer response rates for the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

Survey	Complete responses (no.)	Responding states (no.)	Estimated response rate (%)
State coordinators (Survey 1)	35	35	71.4 (35 of 49 EMG programs in the United States)
Local coordinators (Survey 2)	290	29	18.9 (290 of 1,534 local EMG programs in the United States)[z]
EMGs (Survey 3)	7,498	39	9.75 (7,498 of 76,864 total EMG volunteers in the United States)[y]

[z]As reported in Survey 1; assumes each local program has a local coordinator.
[y]As reported in Survey 1; state responses in this study account for fewer EMG volunteers nationally (76,864) than were reported in the 2015 EMG National Report (83,389). The difference in the two numbers comes from the differences in number of EMG volunteers reported by states responding to each study.

reported by responding state coordinators (Table 1). No paper copies of the survey were returned. The EMG volunteer survey took an average 53.3 min to complete.

PROFILE OF COORDINATORS AND EMG VOLUNTEERS. State coordinators responding to Survey 1 have a mean age of 51.2 years, ranging from 30 to 63 years. State coordinators are 70.6% female and primarily white (94.3%). Most state coordinators (94.1%) have a graduate degree (MS or higher). On average, state coordinators have served in their position 7.2 years (median = 4 years) (Table 2).

Local coordinators responding to Survey 2 have a mean age of 51.9 years, ranging from 22 to 81 years. Local coordinators are 75.7% female. Although they are primarily white (94.3%), there are six additional racial categories reported among local coordinators. Some local coordinators (57.4%) have a graduate degree (Master's or higher). On average, local coordinators have served in their position 7.5 years (median = 5.5 years) (Table 2).

Extension Master Gardener volunteers responding to Survey 3 were 82% female, primarily white (93.7%), and of economic means (76.7% indicate income $50,000 or higher and 36.5% report over $100,000). EMG volunteers have a mean age of 64.8 years (median = 65 years), ranging from 16 to 96 years. Most are married (77.8%) with children (76.8%). EMG volunteers have a broad range of education levels, but the majority (71.6%) have a bachelor's degree or higher. Some EMG volunteers are employed (30.7%), whereas most are retired (64.1%). On average, EMG volunteers have served 7.7 years (Table 2).

The demographics survey included responses from active and inactive EMGs. Of the 7498 complete EMG responses, 91.9% met their state's criteria for active status in 2015 (the prior complete program cycle), whereas 8.1% did not and were considered inactive. Because of its small sample size (n = 448), no additional analysis was performed on inactive respondents, and this group is not included in Table 2.

GENERATIONAL DIFFERENCES AMONG EMG VOLUNTEERS. Four generations (Traditionalist, Baby Boomer, GenX, and GenY) were represented in survey responses. EMG volunteers were 14.5% Traditionalists, 73.2% Baby Boomers, 11.5% GenX, and 0.9% GenY (Fig. 3). Significant differences among EMG volunteers by generation were observed (Table 3). The mean age at time of initial training for each generation was 65.7 years for Traditionalists, 58.1 years for Baby Boomers, 43.0 for GenXers, and 28.2 years for GenYers (Fig. 4).

Extension Master Gardener volunteers in the Traditionalist generation report the longest average length of service to the EMG program (11.8 years), followed by Baby Boomers, who have served an average of 7.3 years. GenX and GenY have served fewest average years with the program (5.5 and 2.8 years, respectively). EMG volunteers in the Traditionalist generation reported an average 122.2 volunteer service hours in 2015. On average, Baby Boomers reported 111.9 volunteer service hours in 2015, whereas GenX and GenY EMG volunteers reported 68.1 and 44.2 h, respectively.

Generational differences in education, work status, race, and income were analyzed (data not shown). Significant association was found between generation and education {chi-square (df) [$\chi^2(18) \geq 93.434$, $P < 0.001$]}, although this relationship was very weak (Cramer's $V = 0.074$). The percentage of volunteers with a bachelor's degree increased with each successive generation, although the percentage of volunteer's with a graduate degree did not follow the same pattern. No association was found between generation and race/ethnicity [$\chi^2(57) \geq 103.210$, $P = 0.076$].

Significant association was found between generation and work status [$\chi^2(15) \geq 1504.922$, $P < 0.001$], and this relationship is moderately strong (Cramer's $V = 0.296$). GenY had the highest percentage of all generations indicating full-time employment (68.5%), whereas Traditionalists had the highest percentage of generations indicating retirement (91%). Only 7.7% of Traditionalists and 27.9% of Baby Boomers indicated full- or part-time employment, whereas 77.7% of GenXers and 87.1% of GenYers report full- or part-time employment.

Significant association was found between generation and income [$\chi^2(15) \geq 118.615$, $P < 0.001$], although this relationship is very weak (Cramer's $V = 0.094$). GenY had the highest percentage (52.8%) of individuals indicating annual income below the median household income level, whereas GenX had the lowest percentage (17.6%) of individuals indicating annual income below the median household income level.

EXTENSION PROGRAMMATIC REGION DIFFERENCES AMONG EMG VOLUNTEERS. Significant differences were evident with respect to extension programmatic regions. Responses were received from all six extension programmatic regions (Table 4). The North Central region participated at the highest rate (40.6%). The Southwest region participated at the lowest rate (5.9%).

Table 2. Demographic parameters of responders to the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

	State coordinator responses		Local coordinator responses		Active EMG volunteer responses	
	Respondents		Respondents		Respondents	
Parameter	(no.)	(%)	(no.)	(%)	(no.)	(%)
Age (years)	mean = 51.2 years		mean = 51.9 years		mean = 64.8 years	
<40	5	14.7	50	24.8	112	2.1
40–49	8	23.5	28	13.9	217	4.1
50–59	12	35.3	46	22.8	834	15.6
60–69	9	26.4	65	32.2	2,582	48.2
70–79	0	0	11	5.4	1,443	26.9
80–89	0	0	2	0.9	163	3.0
90–99	0	0	0	0	6	0.1
Generation[z]						
Traditionalists	0	0	6	3	774	14.5
Baby Boomers	14	41.8	94	46.5	3,920	73.2
GenX	17	50.0	66	32.7	616	11.5
GenY	3	8.8	36	17.8	46	0.9
Gender						
Male	10	29.4	51	24.3	985	18.0
Female	24	70.6	159	75.7	4,483	82.0
Race/Ethnicity						
White	34	94.3	201	94.3	5,168	93.7
African American	0	0	5	2.3	51	0.9
American Indian	0	0	1	0.5	59	1.1
Asian	2	5.7	3	1.4	35	0.6
Native Hawaiian	0	0	1	0.5	9	0.2
Latino	0	0	1	0.5	35	0.6
Mixed	0	0	0	0	64	1.2
Other	0	0	1	0.5	95	1.7
Relationship status						
Single	3	8.6	19	9.3	307	5.7
Married	26	74.3	167	81.5	4,202	77.8
Divorced	2	5.7	7	3.4	473	8.9
Widowed	0	0	9	4.4	390	7.2
Separated	1	2.9	3	1.5	22	0.4
Have children						
No	11	32.4	69	33.3	1,245	23.2
Yes	23	67.6	138	66.7	4,128	76.8
Annual household income						
<$25,000	N/A[y]		N/A		217	4.8
$25,000–$49,999					842	18.5
$50,000–$99,999					1,826	40.2
$100,000–$149,999					979	21.6
$150,000–$199,999					341	7.5
>$200,000					335	7.4
Work status						
Full time outside home	33	97.1	131	62.7	802	14.7
Part time outside home	1	2.9	40	19.1	556	10.2
Full time from home	0	0	3	1.4	115	22.1
Part time from home	0	0	2	1.0	204	3.7
Do not work	0	0	N/A		274	5.0
Retired	0	0	33	15.8	3,490	64.1
Highest level of education						
Some high school	0	0	0	0	3	0.1
High school diploma/General Education Degree	0	0	2	1.0	205	3.8
Some college	0	0	13	6.2	706	12.9
Associate degree	0	0	15	7.2	427	7.8
Technical/professional degree	0	0	1	0.5	207	3.8

(*Continued on next page*)

Table 2. (*Continued*) Demographic parameters of responders to the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

	State coordinator responses		Local coordinator responses		Active EMG volunteer responses	
	Respondents		Respondents		Respondents	
Parameter	(no.)	(%)	(no.)	(%)	(no.)	(%)
Bachelor's degree	2	5.9	58	27.8	1,739	31.8
Graduate degree	32	94.1	120	57.4	2,175	39.8
Host county population density						
Urban	N/A		N/A		5,520	80.5
Suburban					1,177	17.2
Rural					144	2.1
Unknown					15	0.2
Mean years of service	7.2		7.5		7.7	

[z]Traditionalist born 1925–42; Baby Boomer born 1943–60; GenX born 1961–81; GenY born 1982–2000.
[y]Not collected in effort to protect privacy.

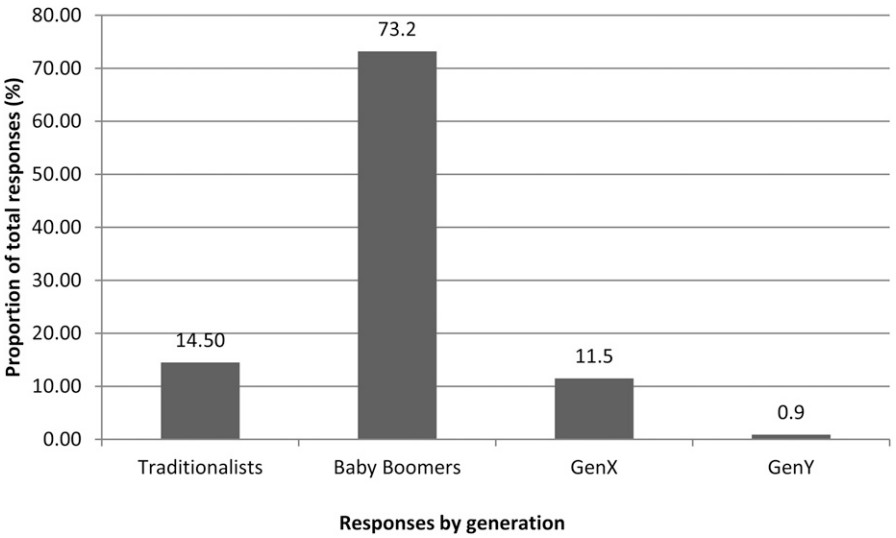

Fig. 3. Extension Master Gardener (EMG) volunteer responses to the 2016 national study of EMG volunteers represented four generations [Traditionalist (born 1925–42), Baby Boomer (born 1943–60), GenX (born 1961–81), and GenY (born 1982–2000)]. Responses from EMG volunteers in the Baby Boomer generation outnumbered responses from all other generation categories combined.

EMG volunteers did not respond proportionately to their extension region. For example, the North Central programmatic region accounted for 22.2% of the total EMG volunteers reported in the study, yet 40.6% of EMG volunteer responses received came from this region.

Extension Master Gardener volunteer characteristics by region were further analyzed (Table 5). The average age of EMG volunteers from Southwest, North Central, and Northeast regions was below the overall average (mean = 64.8 years), whereas the average age of EMG volunteers from Southeast, South Central, and Northwest regions was higher than the average. EMG volunteers from all regions except North Central and Northeast had lower average years of service (mean = 7.7 years) than the overall mean. EMGs in the Northwest region report the highest average number of volunteer service hours in 2015 (mean = 136.6 h), the last complete year before the present study.

Host county population (urban, suburban, and rural) differences among EMG volunteers. No significant differences were detected among EMG volunteers in urban, suburban, and rural programs. The majority of EMG volunteers responding to the survey indicated that they volunteered in an urban county (80.5%), whereas 17.2% of respondents served in a suburban county. Just 2% of EMG volunteers are connected with rural counties (Table 2). This pattern was consistent within EMG programmatic regions, where most of the responses within each region were identified as volunteering in support of EMG programs in urban areas (data not shown). The mean age of urban, suburban, and rural EMG volunteers was 64.8, 65.4, and 63.8 years, respectively. The mean years of active service for urban, suburban, and rural EMG volunteers were 7.6, 7.8, and 7.6 years, respectively. The mean volunteer service hours reported in 2015 for urban, suburban, and rural EMG volunteers was 108.7, 99, and 86 h, respectively (Table 6).

Discussion

This quantitative study provides fresh insight for program coordinators endeavoring to maintain a program that remains attractive to EMG volunteers and relevant to extension priorities. It creates a snapshot in time of the EMG volunteer program, providing a baseline to identify trends and influences that may shape the direction of future program priorities and potential for collaborations between extension programs and maximization of resources (Allen et al., 2011).

Given the length and complexity of the included surveys, the response rate was strong and met appropriate levels for statistical significance. A state representation rate of 71.4% (35 of 49 programs) in this present study was consistent with previous

Table 3. Analysis of means by generation for responses to the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

Variable	no.	Mean[z]	SD	df	*F*	*P*
Current age (years)						
Traditionalist[y]	774	77.5	3.43	3	5,459	≤0.001
Baby Boomer	3,920	65.3	4.58			
GenX	616	48.6	5.69			
GenY	46	29.7	4.33			
Age at initial training (years)						
Traditionalist	729	65.7 a[z]	7.4	3	1,377.3	≤0.001
Baby Boomer	3,744	58.1 b	7.0			
GenX	575	43.0 c	6.7			
GenY	40	28.2 d	3.1			
Years of active service (years)						
Traditionalist	761	11.8 a	6.89	3	178.56	≤0.001
Baby Boomer	3,886	7.3 b	5.64			
GenX	614	5.5 b	4.42			
GenY	46	2.8 c	2.31			
Service reported in 2015 (h)						
Traditionalist	556	122.2 a	175.5	3	16.184	≤0.001
Baby Boomer	3,225	111.9 ab	161.8			
GenX	527	68.1 ab	79.99			
GenY	43	44.2 c	27.80			

[z]Mean separation (in columns) by Tukey's and Games–Howell post hoc tests at $P \leq 0.001$ (lowercase letters). Means followed by the same letter not significant from each other.
[y]Traditionalist (age 74–91 years); Baby Boomer (age 56–73 years); GenX (age 35–55 years); GenY (age 16–34 years).

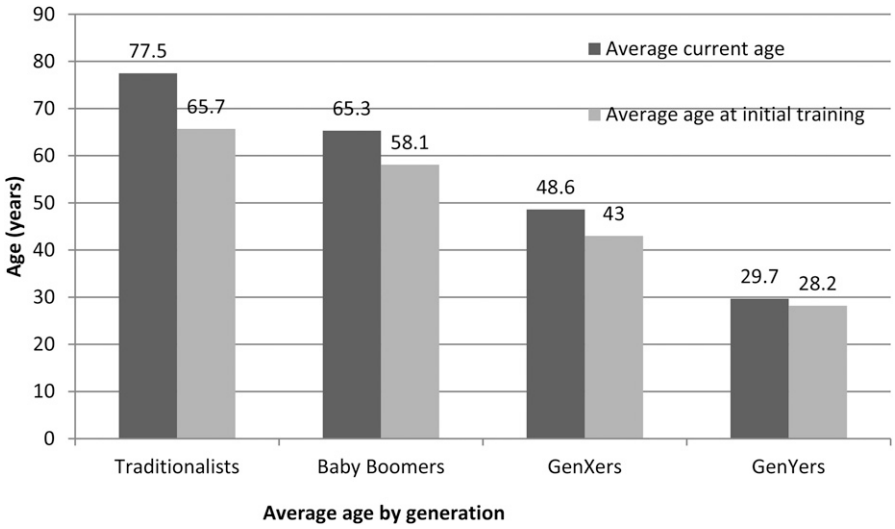

Fig. 4. Average current age and average age at initial training of volunteers responding to the 2016 national study of Extension Master Gardener volunteers differed for each of the four generations represented in survey responses [Traditionalist (age 74–91 years), Baby Boomer (age 56–73 years), GenX (age 35–55 years), and GenY (age 16–34 years)].

participation in national program reports (Cooperative State Research, Education, and Extension Service, 2009; Extension Master Gardener National Committee, 2015, 2017) and a national survey (Vines et al., 2016). EMG volunteer response rate was estimated at 9.74%, based on the number of EMG volunteers reported by state coordinators (Table 1) and the number of EMG volunteer responses (n = 7498) exceeded the amount required (n = 1097) for the desired level of precision (±3% with a 95% confidence level for P = 0.5) for a population of this size (Meier et al., 2015).

The present study suggests this protocol (issuing an online survey followed by paper copy of the same survey) could be modified with this subject group. No paper copies were returned and a high number of online responses were received. This could be attributed to increasing comfort among EMG volunteers with this survey technology, increased access to computers and Internet, or a greater awareness of the opportunity to participate in unified research and evaluation efforts.

This study presents the first plausible estimate of the number of local coordinators. Although Vines et al. (2016) reported that 111 coordinators responded to their social media survey, they do not specify how many were a local or state coordinator. There is no published number of local coordinators, and this number can be highly variable because of position turnover. State coordinators participating in this study reported 1534 local EMG programs in the United States. Assuming there is a local coordinator for each of these programs, the maximum number of local coordinators is 1534. Using this estimate, the local coordinator response rate to this study is 18.9% (n = 290).

Volunteer service

Extension Master Gardener volunteers remain highly committed, as indicated by the number of volunteer

Table 4. Extension programmatic region response rates for the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

	State coordinator survey		Local coordinator survey		EMG survey		
Region[z]	Regional response (%)	States responding (no.)	Regional response (%)	States responding (no.)	Proportion of U.S. EMGs (%)	Regional response (%)	States responding (no.)
Northeast	20	7 of 11	12.4	5 of 11	11.8	13.3	8 of 11
North Central	28.6	10 of 12	27.6	7 of 12	22.2	40.6	10 of 12
Northwest	8.6	3 of 7	13.1	4 of 7	10.5	9.8	3 of 7
Southwest	5.7	2 of 6	3.1	3 of 6	3.4	5.9	4 of 6
South Central	20	7 of 7	13.8	5 of 7	23.3	12.4	7 of 7
Southeast	17.1	6 of 6	30	5 of 6	28.7	18	6 of 6

[z]Extension programmatic regions were established by EMG National Committee: Northeast (West Virginia, Pennsylvania, Delaware, New Jersey, Connecticut, New York, Massachusetts, Maryland, New Hampshire, Vermont, and Maine), 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).

Table 5. Analysis of means by extension programmatic region for responses to the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

Variable	no.	Mean[z]	SD	df	*F*	*P*
Current age (years)						
Northeast[y]	716	64.3 a	9.6	5	11.237	≤0.05
North Central	2,125	64.2 a	9.2			
Northwest	543	65.2 a	9.4			
Southwest	313	64.3 a	9.1			
South Central	668	65.2 a	9.2			
Southeast	919	66.8 b	8.4			
Years of active service (years)						
Northeast	886	7.9 bc[z]	6.060	5	9.027	≤0.05
North Central	2,688	8.1 c	6.030			
Northwest	661	7.4 abc	6.078			
Southwest	388	7.0 ab	6.156			
South Central	850	6.9 a	5.320			
Southeast	1,216	7.3 ab	5.880			
Service reported in 2015 (h)						
Northeast	650	96.4 ab	111.341	5	18.927	≤0.05
North Central	1,946	84.2 a	142.581			
Northwest	475	136.6 d	210.642			
Southwest	305	110.2 bc	148.914			
South Central	601	131.3 cd	170.815			
Southeast	814	129.5 cd	163.885			

[z]Mean separation (in columns) by Tukey's and Games–Howell post hoc tests at $P \leq 0.001$ (lowercase letters). Means followed by the same letter not significant from each other.
[y]Extension programmatic regions were established by EMG National Committee: Northeast (West Virginia, Pennsylvania, Delaware, New Jersey, Connecticut, New York, Massachusetts, Maryland, New Hampshire, Vermont, and Maine), 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).

service hours reported in 2015 and the number of years as an active EMG volunteer. EMG volunteers reported a median of 60 service hours in 2015, surpassing the national median of hours served by all volunteers (52 h), as reported by the U.S. Bureau of Labor Statistics (2016). EMG volunteers have a higher average years of service (mean = 7.7 years) than local (mean = 7.5 years) or state (mean = 7.2 years) coordinators. In many cases, they have out-served their local and state coordinators. This dynamic is an important consideration to incoming coordinators who often must address changing program policies and procedures with a volunteer base that was recruited and trained with different expectations.

Generational differences

Although vastly outnumbered by Baby Boomers, the Traditionalists reported more service hours per volunteer in 2015 than any other generation (Table 4). As this generation gives way to successive volunteers, coordinators may see differences in numbers of volunteer hours committed to EMG programs. Although representing only 12.4% of respondents in the present study, GenX and GenY are becoming active EMG volunteers, entering the EMG program at a significantly younger age, as reflected by age at initial training (Table 4). Although there are logical reasons for lesser participation by younger generations (i.e., work, childbearing, elder family care, etc.), these results suggest that the EMG program model has some appeal to

Table 6. Analysis of means by host county population densities (urban, suburban, and rural) for responses to the 2016 quantitative study of 21st century Extension Master Gardener (EMG) volunteers in the United States.

	no.	Mean	SD	df	*F*	*P*
Current age (years)						
Urban	4,319	64.8 a[z]	9.3	3	1.951	0.119 NS
Suburban	924	65.4 a	8.9			
Rural	106	63.8 a	9.5			
Unknown	8	61.6 a	15.2			
Total	5,357	64.8	9.2			
Years of active service (years)						
Urban	5,471	7.6 a	5.9	3	0.647	0.585 NS
Suburban	1,157	7.8 a	5.7			
Rural	141	7.6 a	5.7			
Unknown	11	9.1 a	9.0			
Total	6,780	7.6	5.9			
Service reported in 2015 (h)						
Urban	3,962	108.7 a	158.2	3	1.561	0.197 NS
Suburban	794	99.0 a	153.8			
Rural	93	86.0 a	101.1			
Unknown	10	72.5 a	45.9			
Total	4,859	106.6	156.5			
Urban						

[z]Mean separation (in columns) by Tukey's and Games–Howell post hoc tests at $P \leq 0.05$ (lowercase letters). Means followed by the same letter not significant from each other.
[y]NS at $P \leq 0.05$.

younger generations and efforts to attract these volunteers may be rewarded.

Given the high levels of education attained by program participants, awareness of trends and techniques in teaching and learning may be important considerations for increasing GenX and GenY participation. The significance of EMG volunteers of the younger GenX and GenY generations to work in some capacity while volunteering bears further exploration. If younger generations are willing to accommodate volunteer opportunities in their work schedules, it may benefit coordinators to consider the goodness of fit between volunteer projects, roles, and times of availability. In addition, the income levels of potential GenX and GenY EMG volunteers could help or hinder future program involvement. When compared with other generations, GenXers are working, indicate more affluent incomes, and may be more likely to afford EMG program fees. GenYers, indicating less income, may not have the financial flexibility to afford EMG program fees. This could limit GenY involvement in local programs, especially those with higher or increased participation and training fees.

As EMG programs include younger generations, coordinators need to be prepared to work with all generations (Arsenault, 2004). There are few resources targeting the needs of younger volunteers available in the EMG Coordinators' Resource Repository (Langellotto and Dorn, 2017), and additional resources are needed. Being flexible and able to leverage differences between generations has reduced turnover in the workplace (Arsenault, 2004) and perhaps could do the same in the volunteer place. In addition, GenY may be the key to diversification of the EMG program. As a whole, this group has more contact with other racial groups (Arsenault, 2004). In addition, it is showing a renewed interest in volunteerism as a way to diversify skills and gain additional experience.

Extension programmatic regions

This study reveals significant differences among EMG volunteer across extension programmatic regions, although the reasons for these differences are not readily discernible. For example, EMG volunteers in the Southeast region were slightly older than EMG volunteers in the other regions. Significant differences in years of active service and number of hours reported in 2015 also exist among extension programmatic regions. These differences could be spurious or could have real causes. Although not identifiable to the authors of this study, regional and local coordinators may recognize the differences as results of retiree transience, age of the local program, program stagnation, or proximity to and availability of volunteer service projects.

Host county population differences (urban, suburban, and rural programs)

Use of the RUCC to describe EMG programs provided unique insight about program distribution and access to its resources. Survey results clearly indicate that EMG programs are predominantly connected with extension programs serving urban counties, although a smaller number of programs exist in suburban and rural counties. With respect to mean age, years of volunteer service, and volunteer service hours reported in 2015, post hoc tests indicate no significant differences in EMG volunteers serving host counties with different population densities (Table 6).

Although the EMG program has spread to suburban and rural counties, it has not established to the same extent in these locations. Fundamental program elements may be more challenging for establishing an EMG program in a rural county, such as recruiting sufficient program participants from

a smaller population base; direct and indirect costs of conducting intensive volunteer training on a smaller scale; wider geographic spread of projects, volunteers, and clients; providing adequate volunteer service opportunities without overburdening smaller volunteer groups; and competing programming responsibilities of agents/program coordinators. Finding solutions to these challenges may create a new frontier for the EMG program, capitalizing on its tremendous potential to reach far more extension clientele than other extension program areas (McAleer, 2005).

Comparison with previous demographic studies

Although a meta-analysis was not attempted, the present study's data were compared with historic demographic data for perspective on EMG program development over time. Comparing current EMG volunteer data to previously published studies shows an aging volunteer base. Relf and McDaniel (1994) provided one of the first demographic reports of EMG volunteers, including in their results three age brackets and a maximum age of 50+ years. More than half of respondents (55%) were older than 50 years of age. Over time, studies of EMGs have reported a progressively wider age range, as reflected in number of age brackets and maximum age (i.e., less than 25, 25–50, 50+ years). For example, Schrock et al. (2000) captured five age brackets with a maximum age of 70+ years; more than half of respondents (60%) were older than 50 years of age. By 2001, Kirsch and VanDerZanden captured seven brackets with a maximum age of 84 years; more than half of respondents (70%) were older than 50 years of age. This trend is confirmed in the present study, with seven age brackets and a maximum age of 99 years. Despite participation by younger generations, nearly all of respondents (94%) in this study were older than 50 years of age.

This study suggests that EMG volunteers have a higher level of income than previous studies. In seven of eight demographic EMG studies published between 1994 and 2016 (Boyer et al., 2002; Kirsch and VanDerZanden, 2002; Relf and McDaniel, 1994; Rohs and Westerfield, 1996; Schrock et al., 2000; Takle et al., 2016; Wilson and Newman, 2011), half or more respondents indicate income levels above the U.S. Census median income for the respective year of study (U.S. Census Bureau, 2017). In the present study, 76% of participants report income levels above the 2015 median income level (Posey, 2016).

The present study reflects a higher level of education among EMG volunteers than previous studies (Boyer et al., 2002; Rohs and Westerfield, 1996; Schrock et al., 2000). Over time, the percentage of respondents reporting higher education levels, such as graduate degrees and post-college training, has increased.

Lack of diversity among EMG volunteers continues to be a concern for the program. Demographic composition of EMG volunteers can create gaps between the volunteers and the communities they serve (Eichberger et al., 2014). Studies of EMG volunteers have consistently reported a higher percentage of females than males with 64% female in 1994 (Relf and McDaniel, 1994) and 82% female in the present study.

Consistent with previous studies, most EMG volunteers are white. Eight race/ethnicity categories were measured, reflecting the most program diversity recorded in demographic studies of EMG volunteers. However, it does not reflect an overall increase in percentage of nonwhite EMG volunteers. Lack of diversity in volunteers is not unique to the EMG program and is consistent with volunteering in general (U.S. Bureau of Labor Statistics, 2016).

This study presented opportunity to document the demographic base of 21st century EMG volunteers in the United States. As the EMG program approaches its fifth decade and momentum builds for national leadership, collaborative programming, and innovative impact reporting, it is important to understand the volunteers and their coordinators to face new challenges and continually advance the EMG program.

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