

Assessing the Tennessee Extension Master Gardener Program Using Both County Coordinator and Extension Volunteer Perspectives

Natalie R. Bumgarner

Joseph L. Donaldson

The University of Tennessee

The Extension Master Gardener (EMG) program is a vital contributor to Tennessee Extension residential and consumer horticulture education and outreach. In 2014, 2,480 volunteers statewide completed service and education requirements to achieve or maintain certified EMG status. These volunteers, led by Tennessee Extension agent county coordinators, contributed over 178,800 hours of service while recording over 30,300 hours of continuing education. These totals illustrate both the contributions of EMG volunteers to horticulture outreach and their desire for education to enhance their own knowledge and skill. Understanding the most needed areas of training for EMG volunteers to support their education and outreach to residents is critical to the growth and impact of the program. Therefore, a study was undertaken in 2015 to survey both EMG volunteers and coordinators to determine educational needs for volunteers as well as the preferred training delivery methods. Respondents consistently rated horticultural training in edible and ornamental crops as well as pest and disease management as high priorities. Similarly, hands-on and in-person presentations and printed materials were rated as highly important training methods. Results indicate potential training priorities for the future but also suggest a need to explore differences between coordinator and volunteer perspectives in some areas.

Keywords: Residential, consumer, horticulture, volunteer, coordinator, outreach, Master Gardener, education, training

Introduction and Rationale

The Tennessee Extension Master Gardener (TEMG) program is a crucial contributor to statewide outreach that enhances the ability of Tennessee (TN) Extension to deliver research-based horticultural information to residents and consumers. The program currently involves approximately 2,480 Extension Master Gardener (EMG) volunteers, more than 35 county Extension agents who serve as county coordinators, and many Extension specialists who contribute to training materials and events.

Direct correspondence to Natalie R. Bumgarner at nbumgarn@utk.edu

From a statewide program perspective, the two critical stakeholder groups for TEMG are volunteers and coordinators. Recruiting and retaining volunteers is obviously essential for the program. Therefore, it is common for surveys and assessments to investigate volunteer attitudes about program priorities (Relf & McDaniel, 1994), program benefits and values (Schrock, Meyer, Ascher, & Snyder, 2000), and factors affecting involvement in the program (Rohs, Stribling, & Westerfield, 2002; Rohs & Westerfield, 1996; Strong & Harder, 2011; Wilson & Newman, 2011). However, it is much less frequent that attitudes and opinions of Extension personnel who coordinate local EMG groups and programming are assessed. Coordinator input is vital not only because of their key role in program leadership and administration but also because of their specific knowledge of local horticultural needs and outreach opportunities.

The TEMG program provides education to TN residents across a range of horticultural topics including sustainable landscape design and maintenance, water and soil stewardship in residential areas, pest identification and management, noncommercial food production, youth horticulture education, as well as human well-being enhancements related to horticulture and plants. It is common to survey EMG volunteers for their perspectives on horticultural topics, such as invasive plants, genetically modified organisms, or landscape management (Borisova et al., 2012; Klingeman, Hall, & Babbitt, 2006). Unlike these assessments of EMG volunteer perspectives on current horticultural topics, this survey focused on areas of direct educational needs within the program (Moravec, 2006). To enable EMG volunteers to carry out education in these many horticultural areas, initial and ongoing training must occur. A focus of this survey was determining the highest priority training needs within the TEMG program to prepare volunteers to carry out educational outreach.

In addition to education in horticultural topics, the efficient operation of EMG organizations and educational outreach involves other potential areas of training including financial management, leadership, and teaching skills. While all areas are important, limited personnel and resources must always be allocated to address areas of largest need to enhance impact statewide. Assessing the relative importance of horticultural versus organizational education was a goal of this effort.

Efficiency and efficacy in training also involves understanding the most impactful methods and tools of instruction (Moore & Bradley, 2015). Many EMG programs nationwide have investigated or introduced elements of distance, video or online learning for their volunteers (Jeannette & Meyer, 2002; Langellotto-Rhodaback, 2010; VanDerZanden & Hilgert, 2002; Young, 2007). Currently, the TEMG program does not heavily utilize these methods, but the need and opportunity may arise in the future. This assessment was designed to include both horticultural and organizational areas of training as well as preferred delivery methods.

Purpose and Objectives

Since volunteers and coordinators may see needs differently, a key aspect of statewide program management is periodic assessment of their respective views on critical educational areas of need. Therefore, the main goal of this work was to compare rankings of needs areas of these two stakeholder groups both jointly and separately. This project was conceived because of divergent feedback received from these two groups at the state level. Its purpose was to solicit feedback to enhance understanding of both volunteer and coordinator needs to provide a comprehensive perspective on designing the framework for education and training in the TEMG program. The conceptual framework was exploratory in nature as this study was a program needs assessment. Specific objectives were to

- Determine high priority needs in educational content in both horticulture and organization,
- Determine preferred methods of training and content delivery, and
- Assess whether volunteers and county coordinators view these needs similarly.

Design and Survey Methodology

The survey was constructed to address the major theoretical framework and objectives presented above and study questions including methods that influence the quality of training experience, needs of the participants, and relative importance of specific horticultural and organizational topics. The survey had 33 questions; 27 were closed-ended questions, and six were open-ended questions. Specific questions addressed in this survey were the areas of horticultural and organizational information deemed most important and the preferred methods of delivery for these educational topics. Example questions and survey layout are shown in Figure 1.

Although 2,480 EMG volunteers were active in the TEMG program in 2014, the Tennessee Extension database houses both current and historical records, so contact information is maintained for those no longer actively volunteering in the TEMG program. Contact information in the database was held for 3,639 EMG volunteers, and 2,568 (70%) had email addresses. Of these 2,568, 1,617 were active (63%), and 951 were inactive (37%). Active refers to those who had participated in at least one program or activity during the previous year or had specifically asked their local Extension office to remain part of EMG mailing lists.

It was important that samples drawn for this study were randomly selected so that they would represent the population on the key variable of inactive and active membership since both groups of stakeholders might hold valuable but different perspectives. Random selection also enabled researchers to generalize the results to the total TEMG population. All samples were drawn using a random number generator by Haahr (2008).

Figure 1. Example Survey Questions

Please consider the items listed below. Check the box to indicate the level of importance or unimportance for planning future Master Gardener programs.

	Not Important	Relatively Unimportant	Neutral	Moderately Important	Highly Important	Don't Know/Unsure
Providing education in ornamental landscape plant selection and care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing education in vegetable crop selection and care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing training through classroom instruction and hands-on experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing training through Master Gardener training materials (manuals, handouts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A pretest was administered in January 2015 using a sample of 25 EMG names. TEMG status (active or inactive) and email addresses were drawn from the 2,568 EMGs with email addresses. Of the 25 selected for the pretest sample, 16 were active (64%), and nine were inactive (35%). The pretest participants were asked to complete the survey and to share any information to clarify the questions and/or improve survey flow. Of the 25 EMGs in the pretest sample, two (8%) email invitations were undeliverable for a corrected sample of 23. Volunteers were given one month to respond to the pretest, and a weekly reminder email was sent, consistent with the Tailored Design Method (TDM) (Dillman, 2006). The TDM was slightly modified since nonrespondents were not tracked; the follow-up email was sent to all members of the pilot group to provide full anonymity to respondents. Response times and rates were monitored to determine response period length for the main survey. The pretest response rate was 60% (14 of 23).

After determining through the pretest that the survey instrument was appropriate, a second sample of 416 EMGs was drawn; 16% of the population with email addresses (416 of 2,568). Of these 416 EMGs, 66 emails were returned (16%). Therefore, the corrected sample was 350; 217 were active (62%), and 133 were inactive (38%).

In addition to the 350 EMGs contacted, the survey was also sent to all 39 Extension Agents who serve as county EMG coordinators. Participants were invited to participate via email. The study was conducted for three weeks in March 2015 with weekly reminder emails. The survey was constructed and deployed using Qualtrics Research Suite (2009). The modified TDM used in the pilot study was again followed (Dillman, 2006). In a meta-analysis of online surveys, Cook, Heath, and Thompson (2000) found an average response rate for online surveys of 39.6%. Since the response rates achieved were at or above this average, a final follow-up during the study's fourth week was not sent. While the response rate among EMG was lower for the actual survey

(43%) than the pilot (60%), this is understandable given that the pilot was conducted in January and the actual study was conducted in March. It is expected that EMG would be more occupied with TEMG programming and gardening activities in March.

A total of 184 surveys were completed by both EMG and volunteers (see Table 1). Results were intended to inform EMG program planning. However, after considering the results, it was evident that the findings had broad implications for EMG programs and Extension volunteerism programs. Therefore, researchers requested and received approval from the University of Tennessee Institutional Review Board (IRB number 15-02253-XM) to publish this research.

Upon completion of the survey period, data were compiled and analyzed in total as well as separately based on respondent designation as a volunteer or coordinator. Means and standard deviations from responses to all closed-ended questions were calculated. From these data and the response number, 95% confidence intervals were calculated to determine if statistically significant differences were present in the responses. This discussion focuses on responses to closed-ended questions relating to 14 topics, including 6 horticultural, 4 organizational, and 4 training methods. These topics addressed both educational content and delivery needs.

Table 1. Participant Response Rates by Role

Role	N	Surveys Completed (n = 184)	Percent of Population Responding
County Extension Agents Coordinating EMG Programs	39	34	87%
Extension Master Gardener	350	150	43%

Results

Survey responses showed that volunteers and coordinators ranked some horticultural topics and some training methods as more important than others (Table 2). The highest ranked horticultural topics were education in vegetable crop selection and care, education in ornamental landscape plant selection and care, education in pest and disease management, and education in environmental aspects of soil and water management, respectively. These four topics were similar in terms of statistical confidence intervals and rated higher than education in turf grass management and lawn care and education in small fruit selection and care.

Providing training through classroom instruction and hands-on experience was the item rated as most important among all fourteen areas and was statistically similar to providing training materials, education in vegetable crops, ornamental landscape plants, and pest and disease management (Table 2). Providing teaching through classroom and hands-on instruction and training materials were both rated higher than online training modules and statewide and regional conferences, which was the lowest rated training method. Some organizational training topics

were also rated as more important than others. Education in volunteer support and management was rated higher than education in fundraising and financial management, which was the lowest rated of all 14 areas surveyed.

Table 2. Overall Rating of Importance or Unimportance of 14 Selected Topics for Future Master Gardener Programming (n = 184)

	Mean	Standard Deviation	95% Confidence Interval (CI)	Category
Training through classroom instruction and hands-on experience	4.80	0.54	4.72-4.88	Training method
Education in vegetable crop selection and care	4.66	0.80	4.54-4.78	Horticultural topic
Training through Master Gardener training materials (manuals, handouts)	4.65	0.65	4.56-4.74	Training method
Education in ornamental landscape plant selection and care	4.62	0.68	4.52-4.72	Horticultural topic
Education in pest and disease management	4.62	0.75	4.51-4.73	Horticultural topic
Education in environmental aspects of soil and water management	4.57	0.66	4.47-4.67	Horticultural topic
Education in residential turf grass management and lawn care	4.21	0.97	4.07-4.35	Horticultural topic
Training through online training modules and materials	4.19	0.90	4.06-4.32	Training method
Education in small fruit selection and care	4.18	0.84	4.06-4.30	Horticultural topic
Training through statewide and regional conferences and meetings	4.03	0.96	3.89-4.17	Training method
Education in volunteer support and management	3.93	1.06	3.78-4.08	Organizational topic
Education in teaching skills	3.70	1.11	3.54-3.86	Organizational topic
Education in organizational management and leadership	3.64	1.12	3.48-3.80	Organizational topic
Education in fundraising and organizational financial management	3.38	1.15	3.21-3.55	Organizational topic

Note: Rated on a five-point scale where 1 = *not important*, 2 = *relatively unimportant*, 3 = *neutral*, 4 = *moderately important*, and 5 = *highly important*.

Between the two groups, the average rating of five of six horticultural topics was statistically higher for coordinators than for volunteers. Turfgrass and small fruit were the topics with the largest difference in average rating between the two groups. Coordinators rated turfgrass at 4.65 and small fruit at 4.56 while volunteers rated them 4.11 and 4.13, respectively. Ornamental

landscape plant, vegetable crop, and pest and disease management were rated 4.64, 4.67, and 4.64 by volunteers and 4.79, 4.85, and 4.88 by coordinators. Environmental soil and water management was the only horticultural topic rated higher by volunteers at 4.65 than coordinators at 4.44.

Coordinators rated three of the four organizational training topics higher than volunteers. The only topic that was rated similarly by the two groups was fundraising and organizational financial management. The importance of all four training methods was rated statistically similarly by volunteers and coordinators.

Within the group of EMG volunteers, the averages of horticultural topics and training methods were similar, while within the coordinator group, horticultural education topics were rated higher on average than training method (Table 3). Within both the volunteer and coordinator groups, organizational education topics had the lowest average rating.

Table 3. Overall Rating of Importance or Unimportance of Selected Topics and Methods for Future Master Gardener Programming by EMG Volunteers¹ and County Agent Coordinators¹

Category	EMG Volunteer Mean ² (n = 123)	County Extension Agents Coordinating EMG Program Mean ² (n = 34)
Horticultural topics	4.47	4.70
Organizational topics	3.62	4.22
Training methods	4.46	4.45

¹ For respondents who self-identified as volunteers or coordinating agents

² Rated on a five-point scale where 1 = *not important*, 2 = *relatively unimportant*, 3 = *neutral*, 4 = *moderately important*, and 5 = *highly important*.

Discussion and Future Directions

This survey provided useful findings to aid in current and future TEMG educational program and material planning. While volunteers and coordinators rated organizational areas of training as being needed, horticultural areas of training were consistently rated higher in importance. It revealed alignment in some key priorities in educational programming for TEMG, while revealing some areas that should receive additional investigation. Previous studies have reported that volunteers are drawn to the EMG program to gain horticultural information (Rohs & Westerfield, 1996; Schrock et al., 2000), and these trends are confirmed here. However, it is clear that some content is ranked as more important than others. Vegetable production, ornamental crop selection and management, and pest and disease management are rated as highly important by all involved in the TEMG program. In the near future, planning efforts will

purposefully be directed toward these three areas as coordinating agents and specialists in Tennessee Extension collaborate on program and materials development.

Some areas of potential divergence between the coordinator and volunteer respondents were in the rating of turfgrass management, small fruit, and environmental soil and water management. Currently, turfgrass and its relative desirability and sustainability in the home landscape is a topic of debate, and these results suggest that more detailed questions may be needed to understand why volunteers and coordinators responded in this manner. Volunteers may value turfgrass within the context of personal preferences or landscaping trends, while agents may value turfgrass information differently because of the portion of their residential client questions in this area. Likewise, small fruit education may be perceived as less needed by volunteers because of their own interests or those in their horticultural circles, while coordinators see more need from their wider frame of reference. The topic of environmental aspects of soil and water management is one that likely deserves more investigation. It may be that volunteers responded because of their views on the topic itself or the sense that they should rate this topic highly, while coordinators responded in terms of specific local programming needs. It may be that these stewardship topics require a better integration with other horticultural training rather than being discussed as a separate area of instruction.

Additionally, implementation of these results should take into account the fact that horticultural topics will generally be rated higher by those involved because this area of interest led them to the Extension Master Gardener program. Just because organizational topics are rated as least important does not mean they should never be addressed. For instance, anecdotal evidence by the author in working with volunteers and coordinators suggests that though rated the lowest of all 14 areas in the survey, financial management questions are one of the most frequent and potentially programmatically disruptive for both volunteers and coordinators. So, even while devoting training and personnel resources to the highest areas of educational need to maximize outreach, some effort must be reserved for training that allows the local TEMG groups to be able to function smoothly and effectively to carry out education and outreach over the long term. Future efforts within the program may investigate the implementation of these organizational training topics to reach specific volunteers who need such training rather than the entire volunteer base of the program.

Though volunteers and coordinators were consistent in their ranking of training methods, perspectives on effectiveness of teaching tools may change. Online training has been reported in other states (Langellotto-Rhodaback, 2010) to retain volunteers in a similar number as in-person. Therefore, these training tools will need to be considered in the Tennessee program as a tool for expanding audiences in the future. Likewise, the high importance placed on the training manual in this survey will need to be balanced with potential alternative delivery methods and digital tools to augment foundational print resources (Moore & Bradley, 2015).

This survey provided information that can immediately aid planning efforts as well as information that suggests a deeper investigation of needs and issues is required. We intend to use these results to strengthen our current program but also provide insight into what questions remain about how the TEMG program, including how volunteers, county coordinator agents, and state and area specialists, can best prepare for future content and program needs. Differences in some volunteer and coordinator responses in this survey suggest areas of investigation that may be of interest to other state Extension Master Gardener programs.

References

- Borisova, T., Flores-Langunes, A., Adams, D., Smolen, M., McFarland, M. L., Boellstorff, D. E., & Mahler, B. (2012). Participation in volunteer-driven programs and their effects on homeowners' landscaping practices. *Journal of Extension*, 50(3), Article 3RIB4. Retrieved from <http://www.joe.org/joe/2012june/rb4.php>
- Cook, C., Heath, F., & Thompson, R. L. (2000). A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement*, 60(6), 821–836. doi:10.1177/00131640021970934
- Dillman, D. A. (2006). *Mail and internet surveys: The tailored design method* (2nd ed.). New York, NY: John Wiley and Sons.
- Haahr, M. (2008). *Random number generator 2.0, beta*. Retrieved from <http://www.random.org/>
- Jeannette, K. J., & Meyer, M. H. (2002). Online learning equals traditional classroom training for Master Gardeners. *HortTechnology*, 12(1), 148–156.
- Klingeman, W., Hall, C., & Babbitt, B. (2006). Master Gardener perception of genetically modified ornamental plants provides strategies for promoting research products through outreach and marketing. *HortScience*, 41(5), 1263–1268.
- Langellotto-Rhodaback, G. A. (2010). Enrollment, retention, and activity in an online Master Gardener course. *Journal of Extension*, 48(4), Article 4RIB3. Retrieved from <http://www.joe.org/joe/2010august/rb3.php>
- Moore, K., & Bradley, L. K. (2015). A review of Extension Master Gardener training manuals around the United States. *Journal of Extension*, 53(1), Article 1TOT1. Retrieved from http://www.joe.org/joe/2015february/pdf/JOE_v53_1tt1.pdf
- Moravec, C. (2006). Continuing education interests of Master Gardener volunteers: Beyond basic training. *Journal of Extension*, 44(6), Article 6RIB5. Retrieved from <http://www.joe.org/joe/2006december/rb5.php>
- Qualtrics research suite*. (2009). Provo, UT: Qualtrics Labs, Inc.
- Relf, D., & McDaniel, A. (1994). Assessing Master Gardeners' priorities. *HortTechnology*, 4(2), 181–184.
- Rohs, F. R., Stribling, J. H., & Westerfield, R. R. (2002). What personally attracts volunteers to the Master Gardener program? *Journal of Extension*, 40(4), Article 4RIB5. Retrieved from <http://www.joe.org/joe/2002august/rb5.php>

- Rohs, F. R., & Westerfield, R. R. (1996). Factors influencing volunteering in the Master Gardener program. *HortTechnology*, 6(3), 281–285.
- Schrock, D., Meyer, M., Ascher, P., & Snyder, M. (2000). Benefits and values of the Master Gardener program. *Journal of Extension*, 38(1), Article 1RIB2. Retrieved from <http://www.joe.org/joe/2000february/rb2.php>
- Strong, R., & Harder, A. (2011). The effects of Florida Master Gardener characteristics and motivations on program participation. *Journal of Extension*, 49(5), Article 5FEA10. Retrieved from <http://www.joe.org/joe/2011october/a10.php>
- Wilson, J. C., & Newman, M. E. (2011). Reasons for volunteering as a Mississippi Master Gardener. *Journal of Extension*, 49(5), Article 5RIB1. Retrieved from <http://www.joe.org/joe/2011october/rb1.php>
- VanDerZanden, A. M., & Hilgert, C. (2002). Evaluating on-line training modules in the Oregon Master Gardener program. *HortTechnology*, 12(2), 297–299.
- Young, L. (2007). Re-designing a Master Gardener training program to meet the changing needs of volunteers and Cooperative Extension. *Journal of Extension*, 45(5), Article 5IAW2. Retrieved from <http://www.joe.org/joe/2007october/iw2.php>

Dr. Natalie Bumgarner is an Assistant Professor and Extension Specialist in Residential and Consumer Horticulture for the University of Tennessee. Her work focuses on education and research in the areas of food production and landscape stewardship for Tennessee residents.

Dr. Joseph Donaldson is an Assistant Professor in the Department of 4-H Youth Development, Agricultural Leadership, Education and Communications at the University of Tennessee. He works in all aspects of program planning, evaluation and accountability.