

Applied Research Engages Extension Master Gardener Volunteers

Abstract

Extension master gardener (EMG) volunteers can be a valuable resource for Extension professionals in applied research if they are given clear instructions and tools for success. We developed recruitment and training materials for EMGs that equipped them for planting, maintaining, and collecting data in four demonstration/research gardens to measure the benefits of biochar on plant growth. EMGs' evaluations showed 80% satisfaction with the quality of the project, the education they gained about biochar, the volunteer training experience, and the communication methods used. Volunteers reported that working in applied research was a fulfilling educational experience.

Keywords: [demonstration gardens](#), [biochar](#), [applied research](#), [Extension master gardener](#), [self-determination](#)

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Introduction

The Extension master gardener (EMG) program has been training volunteers to teach horticulture for nearly 50 years (Meyer, 2007). Retention and satisfaction is higher when volunteers feel valued, know their work is making a difference, engage with projects that provide them with a sense of ownership (McCurley & Lynch, 2006), and gain knowledge that can be directly applied to their volunteer work (Reiners, Nichnadowicz, Nitzsche, & Bachelder, 1991). From 2012 to 2015, University of Minnesota EMGs were involved in a project that met these criteria. The EMGs partnered with Extension professionals to investigate the effects of biochar as a soil amendment by developing and maintaining four demonstration/research gardens.

As we developed the biochar project, we found few resources detailing approaches for successfully involving master gardeners in collaborative applied research. Consequently, we developed our own strategies and materials. In this article, we present details about our approach and the materials we used to recruit and teach volunteers and evaluate their satisfaction with participating in an applied research project. Our goal is not to report the results of the biochar research but to describe the components used to administer such a project to enable other Extension programs to successfully engage volunteers in applied research.

Volunteer Recruitment and Training Model

We needed EMGs to set up demonstration/research gardens with specified amounts of biochar; plant and maintain the specific crops according to prescribed guidelines; and measure yield or plant growth and development and report the data as directed over the course of four growing seasons. We knew that meeting volunteer needs would be key to our success. In developing materials for the project, we considered the self-determination theory tenet that people are more likely to be intrinsically motivated when basic psychological needs, such as autonomy, competence, and relatedness, are met and key volunteerism priorities, such as flexibility, preparation of skills, and support from Extension staff and other volunteers, are considered (Frendo, 2013).

Antonelli (1992) described relevant methodology but did not identify program and managing components necessary for a collaborative research project. Consequently, we determined that we would need to provide the EMGs with step-by-step guidelines for collecting research data. Cassill, Culp, Hettmansperger, Stillwell, and Sublett (2012) suggested that empowering volunteer middle managers helps Extension program developers save time and resources while achieving project goals. Accordingly, we determined that we would designate EMG site leaders and assign them specific responsibilities of scheduling EMGs and monitoring data records, thereby reducing staff time. We adhered to the recommendations of Culp et al. (2009), who noted the importance of planning tools and aids for ensuring volunteer and project success. We created materials that were helpful for recruiting, communicating roles and responsibilities, and training the EMGs (Table 1).

Table 1.

Recruitment and Training Model Materials Developed for Extension Master Gardeners (EMGs)

Item	Author	Format	Access
EMG volunteer and site leader project position descriptions	Lynne Davenport-Hagen, master gardener program coordinator and biochar demonstration garden project manager, University of Minnesota Extension	Word documents	Printed copies, distributed during recruitment events
EMG project application	Lynne Davenport-Hagen	Word document	Printed copies, distributed during recruitment events
Biochar demonstration/research gardens and recruitment overview	Lynne Davenport-Hagen Julie Weisenhorn, associate Extension professor, University of Minnesota Extension	PowerPoint presentation	Presented in person to 450 EMGs in six counties
<i>Biochar, What Is It?</i>	Kurt Spokas, U.S. Department of Agriculture Agricultural Research Service, soil and water management and adjunct professor, University of Minnesota Department of Soil, Water and Climate	PowerPoint presentation	Online access, Minnesota EMG website
Data collection instructions	Lynne Davenport-Hagen	Word document	Printed copies, distributed to EMGs

			servicing on project
Data collection worksheet	Lynne Davenport-Hagen	Word document	Printed copies, distributed to EMGs servicing on project
Flower data reporting form	Lynne Davenport-Hagen	Google forms	Online, accessed only by EMG site leaders
Vegetable data reporting form	Lynne Davenport-Hagen	Google forms	Online, accessed only by EMG site leaders

Project Details and Data Collection

The research objective for the project with which the EMGs were involved was to determine whether biochar-amended soil increased growth, yield, and floral production as part of a National Institute of Food and Agriculture Specialty Crops Research Initiative grant. Our volunteer management objectives were to successfully recruit, train, and engage EMGs in applied research.

Four identical demonstration/research sites representative of a typical home garden were planted with flowers and vegetables with three different levels of biochar in the following locations in Minnesota: Saint Paul, Ramsey County; Chaska, Carver County; and Andover, Anoka County. Each demonstration/research site was equipped with garden tools, a digital scale, cameras for documenting plant growth, and a step-by-step guide for growing, measuring, and recording data. EMGs assisted with incorporating the biochar, planting and maintaining the gardens, and using easy-to-follow reporting worksheets for recording plant heights and widths, produce weight, leaf color, and floral counts. (The data collected by the EMGs allowed us to produce a full report of the effects of biochar on growth and yield; the report can be found online at <https://cenusa.iastate.edu/>.)

In providing in-person detailed project presentations to 450 EMGs, we recruited 79 EMGs who participated in online biochar training that included comprehensive instructions for garden management and data collection. With clear guidelines, assurance of staff support, and a sense of autonomy, EMGs eagerly participated in the project. Although there was variation in the data collected across the sites, we found that having the volunteers use the data collection instructions and forms while they collected data was extremely important to our being able to compare results at each location.

Outcome Evaluation

Eystad (1997) noted that program and outcome evaluations are a critical part of determining program success. When the 4-year project was finished, we asked 79 EMGs to complete an outcome evaluation. Forty-three completed usable surveys, for a response rate of 54%. Motivating factors for EMGs to volunteer on the project were the desires to gain biochar knowledge and to actively participate in applied research. EMGs valued their volunteer service, with 88% stating that they were satisfied or very satisfied with their overall experience, including quality of the project, education gained, and training and communication methods used.

Although applied research can be complex for volunteers to understand and involves time and effort to teach, we found that volunteers liked applied research and considered it to be meaningful and satisfying educational work.

Adding a research component to volunteer service made the experience richer and more fulfilling and encouraged retention (Relf, Williams, & Silva, 1990).

Summary

EMGs volunteered for 4 years in an applied research project at four public demonstration/research sites involving biochar-amended soil. Detailed training and data collection materials were developed to equip EMGs to successfully carry out their roles and responsibilities in the project. The EMGs appreciated the autonomy and flexibility of the project and gained new knowledge about biochar and how to conduct applied research in their local communities. Volunteers reported high satisfaction with the training and with what they learned from the project. Engaging volunteers in Extension research has been shown to have widespread benefits for both the Extension professional and the volunteer. Meyer et al. (2014) concluded that participants enjoy and learn from citizen science experiences and enact meaningful change in their communities and personal identities. We hope our project can be a model for other Extension educators working with volunteers in applied research programs.

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