

XXXXXXXXXXXX

Commercial and Consumer Horticulture Agent, XXXXXXXXXXXX County

*Introduction*

My name is XXXXXXXXXXXX and I have served as the Commercial and Consumer Horticulture Agent for XXXXXXXXXXXX County since XXXXXXXXXXXX. My major areas of responsibility in this capacity are to provide educational programming and home horticulture assistance to the residents of XXXXXXXXXXXX County, as well as the green industry professionals, which include landscapers and nurserymen. I also provide assistance to farmers growing traditional and alternative horticultural crops in XXXXXXXXXXXX County. I currently serve as the Pesticide Education Coordinator for XXXXXXXXXXXX County and provide region-wide training for private (farmer) applicators and commercial applicators seeking license renewals each year. I also manage and advise a very active Extension Master Gardener Volunteer Program.

Other responsibilities include working with county and town governments to address urban forestry-related issues. For the past three years I also have served as the regional editor for the *Extension Gardener*, a statewide publication that, in XXXX, had approximately XXXXXXXXXXXX throughout North Carolina.

To accurately validate the types of programs that are offered through my Horticulture Program in XXXXXXXXXXXX County, I will provide a brief synopsis of the demographics of the county and explain how and why a robust and innovative horticulture program is necessary for residents, professionals, and farmers who are major supporters of the economic and environmental livelihood of XXXXXXXXXXXX County.

An abundance of pristine natural resources make XXXXXXXXXXXX County an attractive destination for permanent residents from all across the world, most of whom are at retirement age. XXXXXXXXXXXX County is North Carolina's fastest growing county (U.S. Census Bureau, XXXX). As of XXXX, people 65 and older accounted for XX% of the total population in XXXXXXXXXXXX County (Access NC, XXXX), and by 2019, growth of XXXXXXXXXXXX County's population is projected to increase from approximately XXXXXXXXXXXXXXX permanent residents (Access NC, XXXX). Of the nearly XXXXX individuals relocating to XXXXXXXXXXXX County each year, the majority are from areas outside of North Carolina. An affluent retiree population and a growing interest in home gardening means that more and more homeowners are beginning to place a high value on home landscaping, particularly in regard to ornamentals and turfgrass. The challenges of gardening in this area are numerous and this is one area in which my program currently is focused.

Though not all retirees are interested in home gardening, nearly all of those living in communities with homeowner or property owners associations do have strict guidelines for aesthetically pleasing home landscapes. As the housing industry picks up in XXXXXXXXXXXX County, there will continue to be a high demand for knowledgeable landscapers and nurserymen who also are equipped to deal with the challenges of XXXXXXXXXXXX County. This is one other aspect of the educational goals of my program.

A multi-million dollar green industry contributes significantly to the aesthetic and functional quality of our area. Landscapers and nurserymen should be prepared to communicate effectively with consumers in XXXXXXXXXXXX County who seek out their services. This includes communicating best management

practices with regard to insect, disease, and weed management, including chemicals that are used in their operations. Growing concern of pollinator health by the professional and public sectors means that landscape and nursery professionals should have more in depth knowledge of pesticides that are known to be toxic to pollinators, and the ability to communicate with the general public.

Though there are many affluent residents living in XXXXXXXXXXXX County, there are still approximately XXXXXXXX residents who are living below the poverty level. XXXXXXXXXXXX County is geographically the XXX largest county in North Carolina, yet has a relatively low population density. This is particularly true within the communities that are farther inland in XXXXXXXXXXXX County. Typically, food access is more difficult in rural areas because of a lack of reliable transportation (USDA, 2009). In these areas, much of the horticulture interest lies mainly in home food production such as fruits and vegetables, as well as home food preservation. In more urbanized communities such as in Southport and Shallotte, space for home food production is limited yet is still of interest to residents who want to grow their own food. My programming has also been focused on this aspect of horticulture.

The following pages will describe in more detail how I have used my plan of work objectives to help guide my main program areas, as well as the specific types of programs that have been implemented for my Commercial Horticulture, Consumer Horticulture, and Master Gardener Volunteer programs. I will further discuss how I have marketed my programs to increase awareness and profile of specific Horticulture Program in XXXXXXXXXXXX County, but to the overall county and state extension program as well. I will discuss leadership roles and the diversity of professional development opportunities in which I have participated and how that has helped prepare me to better serve the residents of XXXXXXXXXXXX County and further the mission of NC State Extension and the land grant tradition.

## 1.1. Consumer Horticulture Program

### 1.1.a. Program Planning

I direct the Consumer Horticulture Program and report under the Urban and Consumer Agriculture objective in the Employee Reporting System (ERS). Urban and Consumer Agriculture is defined as:

“Residential, commercial and public entities will make decisions regarding plant selection, placement and management that will decrease water consumption, preserve and improve water quality, mitigate storm water contaminants, reduce erosion, energy consumption, and greenwaste, expand wildlife habitat, improve real estate value, and improve diet and nutrition of consumers. Over 50% of the population now lives in urban areas. Despite evidence of the ecological and financial benefits, environmentally responsible landscaping strategies are not being implemented widely. Renovating a landscape to incorporate water conserving strategies may result in using 36% less water. Urban water run-off accounts for the majority of water pollution, mostly pesticides and fertilizers that does not come from a specific industrial source. Selection of well-adapted plants, effective pest management, and appropriate care and feeding of plants will greatly reduce dependence on fertilizers and pesticides. Rain water that is not absorbed by the soil becomes erosive storm water runoff, which transports pollutants such as fertilizer, pesticides, sediment, motor oil, litter, and animal waste to local streams and rivers. Landscape designs will include rain gardens and other runoff catchment facilities (underground cisterns, etc.) that are attractive and easy to maintain in residential

areas. Homeowners will learn that proper plant selection and placement can reduce winter heating bills by as much as 15% and summer cooling bills by as much as 50 percent, while reducing the need to prune over-sized plants. Wild habitat areas are rapidly being converted into housing and commercial properties, displacing native plants and animals. Choosing native or adapted plants that provide food and shelter creates a haven for butterflies, birds, lizards, and other animals. Edible landscaping can increase the amount and expand the variety of fresh fruits and vegetables consumed.

As of XXXX, people 65 and older accounted for XX% of the total population in XXXXXXXXXXXX County (Access NC, XXXX), and by 2019, growth of XXXXXXXXXXXX County's population is projected to increase from approximately 116,000 to 128,500 permanent residents (Access NC, XXXX). Of the nearly XXXX individuals relocating to XXXXXXXXXXXX County each year, the majority are from areas outside of North Carolina.

Gardening is a popular pastime after retirement because of the numerous benefits that it offers. However, whether someone chooses to garden or not, most people want attractive home landscapes. For residents with homeowners or property owners associations (HOA/POA), regulations are in place that make it a requirement. However, there are many challenges to gardening in XXXXXXXXXXXX County and throughout southeastern North Carolina that can make this difficult. From soil and plant selection, to landscape maintenance and pest management, gardening for new residents is frustrating and may lead to non-sustainable practices that contribute to environmental pollution and decline of beneficial wildlife, including pollinating insects. In many urban, suburban, and urban/agriculture areas, water pollution is a concern. As residential urban areas expand in XXXXXXXXXXXX County and high demand for aesthetic landscapes increases, it is necessary to equip homeowners with the tools to help them make informed decisions about proper maintenance of residential landscapes, with a focus on environmental and economic sustainability.

XXXXXXXXXXXX County, as stated earlier, is the fastest growing county in North Carolina with a current population of approximately XXXXXXXXX permanent residents. XXXXXXXXXXXX County also supports a robust and vibrant tourism industry, home to XXXXXXXXXXXXXXXXXXXX that are a major tourism draw in the summer and early fall months. Though its population is growing rapidly, XXXXXXXXXXXX County has a relatively low population density with approximately XX% of its residents living at or below the poverty level. Of concern for many of these residents is growing or consuming fruits and vegetables and/or having greater access to healthier food. The Consumer Horticulture Program also addresses the needs of those residents growing fruits and vegetables for personal consumption. From proper soil management, to varietal selections and timing of planting, to maintenance and pest control, vegetable gardeners face their own set of obstacles that may prevent them from achieving success and having the feeling of accomplishment and self-sufficiency. This component of the Consumer Horticulture Program will provide knowledge and expertise to residents and communities interested in personal fruit and vegetable production. It will deliver practical knowledge and guidance on the design, implementation, and maintenance of gardens, including site selection and plant selection and maintenance. Participants also will be exposed to advanced gardening practices such as composting and vermicomposting, IPM strategies, and season extension strategies.

Thus, the Consumer Horticulture Program in XXXXXXXXXXXX County must be prepared to provide comprehensive and diversified educational opportunities that meet the needs of both of these groups. The Consumer Horticulture Program is prepared to work with local townships and municipalities to help identify specific community needs that pertain directly to both food production and sustainable ornamental

landscaping. Based on the 2012 XXXXXXXXXXXX County survey and my advisory council, urban and consumer horticulture is an area on which my program should focus. **With members of my advisory council, which included XX, we were able to identify goals and objectives for my consumer horticulture program.** The advisory council has offered suggestions for ways to better identify the needs of each community, types of programs to be offered, instructional methods to be used, and innovative strategies for reach underserved populations.

This program strives to bring communities together through the implementation of community gardens. It works with local municipalities to help organize, plan, design, and maintain community gardens with the intent of providing residents more access to locally produced food. Onsite classes covering a variety of topics will be offered and taught by Extension Staff and Extension Master Gardener Volunteers.

## 1.1.b. Program Design

### *Program Goals*

The Consumer Horticulture Program in XXXXXXXXXXXX County addresses home horticulture-related topics to local residents in various aspects of lawn, garden, and landscape care with emphasis on environmental stewardship. This program will foster XXXXXXXXXXXX County's natural resources through:

- Ensuring that participants have a better understanding of the land grant system and the role it has in reaching underserved audiences in XXXXXXXXXXXX County and throughout North Carolina.
- Development of educational programs that address integrated pest management strategies for ornamental and vegetable production, including proper plant selection, placement, and maintenance;
- Utilization of innovative technologies and teaching strategies to reach new audiences;
- Greater collaboration with local green industry businesses in the region;
- Maintenance of functional and productive relationships with outside agencies;
- Grassroots organization of groups interested in local food access for underserved audiences;
- Development of adult and youth horticultural educational programs utilizing the XXXXXXXXXXXX County Botanical Garden;
- Growing long-term support from county stakeholders and residents by demonstrating the positive Participants will continue to utilize resources from NC State and NC A&T Universities in XXXXXXXXXXXX County;
- More long-term follow up with clients after initial trainings;
- Securing greater food access for underserved communities through continued partnerships with townships and community gardens.

### *Program Objectives*

#### *Short-term objectives*

- 100% of participants will use Extension-based resources for the home gardening information.
- 90% of participants will adopt at least one IPM strategy for their home garden, including "right plant, right place."

- At least 80% of participants will buy plants from local vendors and 60% will choose plants native to Coastal NC for their home gardens.
- 50% of participants will be taught by Extension Master Gardener Volunteers throughout the year.

*Long-term objectives*

- 70% of first-time contacts will continue to seek out Extension-based resources in XXXXXXXXXXXX County.
- 70% of participants will note a cost savings from following IPM practices.
- Community gardens will have at least 50% of its participants who are low income.
- 5% of participants will become Extension Master Gardener Volunteers.

*Measures of Progress*

The Consumer Horticulture Program in XXXXXXXXXXXX County serves a multitude of individuals, each with specific needs relating to home horticulture. This program strives to educate more individuals on proper plant selection, soil nutrient management, pest management, proper plant care practices, varietal selections, and much more. XXXXXXXXXXXXXXXXXXXX is an instance where, over time, strong community relationships have been formed with XXXXXXXXXXXX County Extension. In XXXX, I presented several talks relating to plant selection for coastal environments, as well as one talk on pruning, which reached a total of XX individuals. In XXXX, I was invited back, this time to talk about IPM and plant selections for XXXXXXXXX, to which approximately XX people attended. In XXXX, I was again invited back, this time with XXXXXXXXXXXXXXXXXXXXXXXXXXXX, to present on Rain Gardens and Native Plants for Home Landscapes.

**Attendance to this program increased 67% from the previous year to XXX participants.** I see greater community relationships such as these being formed throughout the county, including local churches, towns and municipalities, and landscape committees in individual housing developments. I look to feedback from clients to help me gauge the growth of my program:

*On behalf of the XXXXXXXXXXXXXXXXXXXX, we want to thank you for the wonderful (and very entertaining) talk on pollinators last week. Purchasing chemicals can be daunting, especially since most of us are gardeners and want to protect pollinators. Your talk help clear things up tremendously! Thank you again!*

*Thanks so much for taking the time to meet yesterday. Your opinions and guidance were much appreciated!*

*Your personal attention to these inquiries is very much appreciated. You are, as usual, a wonderful resource. I'd really rather prefer to be talking about my vegetable gardens - I love that stuff!*

*Evaluation Strategies*

I am constantly evaluating the efficacy of the Consumer Horticulture Program as a way to benchmark the growth of the program in XXXXXXXXXXXX County. I seek to make improvements based on how satisfied attendees were with the information, whether it was relevant to their needs, and what, could be improved for future workshops. I also evaluate changes in knowledge, aspirations, skills, and attitudes in post evaluations by gauging the likelihood of participants to change a certain behavior or adopt a new practice. I evaluate the number of speaking engagements and community events our office is asked to fill, as well as

the different types of topics that we are filling for those communities. I evaluate the number of phone calls and walk-in clients by utilizing an online database that is updated yearly.

### 1.1.c. Program Implementation—Outputs and Activities

When I first began in my position in XXXX, I had the opportunity to deliver a program on growing fruits and vegetables at XXXXXXXXXXXXXXXXXXXXXXXXXXXX with the Family and Consumer Sciences Agent. XXXX is an organization that provides educational opportunities for developmentally delayed adults. After talking to the director of the program, she mentioned the need for her students to have a more in-depth class on how to grow vegetables as a part of a healthier lifestyle. Along with the FCS Agent and Horticulture Program Assistant, we developed a 7-week program called XXXXXXXX that walked students through the process of starting a plant from seed all the way up to harvesting. This program involved local Master Gardener Volunteers, who helped with the direction and guidance for the hands on portion of the class. This program reached nearly XXXXXXXXXXXX for the 7 weeks. **At least three participants went on to continue gardening in their own plots**, using the information that NC State Extension had provided. We followed up later in the spring and found a garden full of vegetables that students were excited to harvest (and eat). We had a taste test for the students with some of the prepared foods which delighted some, and others not so much. The director of the program indicated an increase in enthusiasm for the garden by individuals who had not previously demonstrated interest, as well as reduction in the amount of negative interactions that some students had with one another. They were **able to identify certain pests in their garden and describe some ways in which pests and beneficials could be managed.**

In the spring of 20XX, XXXXXXXXXXXX County experienced an outbreak of kudzu bugs, which at the time were a relatively new pest being found in and outside of home residences. I received numerous calls from both homeowners and farmers alike who were concerned about the negative effects of this new pest. Because of the expansive nature of XXXXXXXXXXXX County and the surrounding counties, reaching people on an individual basis was not possible. In order to reach as many people as possible, I utilized my contacts at local television news stations and newspapers to get the word out about the identification and subsequent control of this new pest. In April of 20XX, I appeared on the evening news to discuss how kudzu bugs were identified and how homeowners could better control them and prevent them from destroying plant materials. Through newspaper press releases **I was able to reach nearly XXXXXXXX, and an additional XXXXXXXX residents regionally were reached** as a result of my appearance on television. Follow up calls from homeowners, as a result, were focused on how they could prevent kudzu bugs entering their homes the following year instead of treating them with insecticides, which are largely ineffective in controlling this pest. Homeowners also reported **saving an average of \$20-30 on chemicals** as a result of my newspaper and television appearances.

In 20XX, I developed and implemented a community garden with XXXXXXXXXXXX. I attended several town hall meetings as a guest speaker to talk about the benefits and drawbacks of community gardens and to gauge initial interest in exploring opportunities for a garden. Because of previous experience, I was selected to head the committee that developed and planned that initial design of XXXXXXXXXXXX. From May to December, 6 committee meetings were held that saw the progression of the development of XXXXXXXXXXXX. I helped members prepare a budget for the garden, as well as designed a pollinator demonstration garden with several of the other committee members. In early 20XX, the plan was approved and scheduled for construction by XXXXXXXXXXXX. **Throughout 20XX, I helped facilitate conversations and disagreements between members of the committee and was able to reach mutually agreeable**

**comprises.** Though the garden construction has been delayed by other phases of the town park, the garden is still on track to be constructed in 20XX. This will afford those with limited space and access to food an opportunity to learn and to grow vegetables for personal consumption.

Similarly, I collaborated with Horticulture Program Assistant, XXXXXXXXXXXXXXXX, to plan and deliver a series of classes for the already-established XXXXXXXXXXXXXXXXXXXXXXXXXXXX on integrated pest management (IPM). This 6-week course was offered at various times of the year to accommodate pest cycles and so that participants could have hands on experiences with identification of vegetable insect and disease pests. Post evaluations indicated a **95% increase in knowledge on IPM**, and **90% willingness of participants to adopt at least one new IPM strategy**. Follow up evaluations indicate that at least **85% of participants are still utilizing IPM strategies in their XXXXXXXXXXXXXXXXXXXX one year later**. There has been a reduction in the amount of pesticides used by individuals in the community garden, as well as reduced pesticide use in home vegetable gardens.

For three years, I have established a working relationship with XXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXX School. In 20XX, I delivered a program on “Careers in Horticulture” for his XXX students. After the program, we discussed the possibility of having a program at the XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX. With much planning and tremendous help from Master Gardener Volunteers, we were able to hold a week-long event for the 6<sup>th</sup> graders in our Botanical Garden for the first-ever “Hands on Horticulture” program. This program teaches lessons on topics related to horticulture such as propagation, composting, beneficial insects, plant identification, and using plants to filter stormwater (rain gardens). Pre and post evaluations **indicated a 70% increase in knowledge after the event**. The teachers were so impressed with the event that in 20XX they returned again for the second annual “Hands on Horticulture” Program. This time, about XXX students were taught lessons similar to the year prior. Each lesson was aligned with the NC Science Standards curricula and reinforced concepts learned throughout the year and were on the end-of-grade tests. A total of **15 Master Gardener Volunteers and 5 staff members reached nearly 700 students in two years, with nearly 80% showing an increase in applied knowledge. For 100% of those participants, it was the first time they had ever visited a botanical garden**. At least two students have since contacted me to ask about vermicomposting. Teachers were so impressed with the program that they have requested it for other schools and other grade levels. One teacher stated that, “Your program was better than we could have asked for—I even learned some things that I plan on using in my own class.”

Population growth in XXXXXXXXXXXXXXXXXXXXXXXX is expanding at a rapid pace. Oftentimes, this growth in population is to the detriment of the natural areas that make this a particularly ideal choice in which to live and recreate. In 20XX, working with Natural Resources Agent, XXXXXXXXXXXXXXXX, we identified a need of the community to have a program that was targeted towards educated homeowners about the basics of ecology of urban environments. Collaborating with Education Specialist, XXXXXXXXXXXXXXXXXXXXXXXX, we successfully developed and implemented *The Backyard Naturalist* Program, which was offered to residents in XXXXXXXXXXXXXXXXXXXXXXXX Counties. This collaborative effort brought together XX individuals from various professional backgrounds, including those working in pharmaceuticals and engineering, public educators, as well as Master Gardener Volunteers. Professionals specializing in different areas of wildlife and wildlife management were invited to speak each week to the class. This program also saw the implementation of the *Eco Tower*, which was a hands on instructional tool used to reinforce concepts learned in class. Post evaluations of the program indicated 85% increase in gained knowledge in at least three different subject areas. **All XX participants stated that they would recommend this program to others. Post-program evaluations also indicated that 80% of participants were currently participating in the 10% Challenge**, whereby individuals were



- **XXXXX new participants** who utilized extension-recommended best management practices in home landscapes;
- **Reduced of XXXXXXXX of greenwaste** as a result of Extension-based recommendations;
- **XXXXXXX in cost savings** from appropriate selection of landscape plants;
- **XXXXX participants who implemented extension-recommended practices to conserve water and protect water quality;**
- **XXXXXX youth participants reached through 4-H youth development programs**, school outreaches, STEM Program, and summer programs.

### *Testimonials*

From a pruning workshop in 20XX: “I just want to say how much my husband and I enjoyed your pruning program at XXXXXXXXXX Library last week! We now feel better prepared to properly prune our trees and shrubs—and now we argue less, so thank you also for helping me not want to kill him anymore.”

From a school outreach program in 20XX: “I want to thank you for taking the time to come to XXXXXXXXXXXXXXXXXXXX School to do your engaging pollinator talk and the hair-raising Zombie Bug presentation to both classes. The kids were talking about it for days afterwards and have asked for an encore next year.”

From a participant from the XXXXXXXXXXXXXXXXXXXX in 20XX: I plan on utilizing the *Eco Tower* in my classroom next year. This is a fantastic way to get kids engaged in learning about ecosystems and how everything in the environment is connected in some way.

From a participant in the XXXXXXXXXXXXXXXXXXXX in 20XX: I work inside all day, so this was a great way for me to connect with other, like-minded individuals on a Thursday night and learn about our natural environment. This has helped to become more knowledgeable about our local environment, and as a result, I feel better prepared and more willing to be more involved with environmental advocacy.

## **1.e. Societal Benefits**

The Consumer Horticulture Program in XXXXXXXXXX County strives to improve the quality of life for all residents who seek our services. Through strategic planning and focused delivery of community-specific programs, we can provide residents with information they may not otherwise receive. We also can reduce the amount of pesticides and fertilizers that are being applied by instructing people on the proper methods for addressing home horticulture challenges in XXXXXXXXXX County. We can begin to re-establish habitat for wildlife by instructing homeowners on creating wildlife friendly habitats that are also low-maintenance and enhance the overall aesthetics of the community. This program can provide local economic impacts in that we can connect residents with the many local nurseries in the area that carry plant materials suited for this growing region. We can further the enhancement of local communities by providing greater food access where it is needed. Establishing and then maintaining community gardens and providing gardening programs can certainly benefit the individual, but this can also translate into a community-wide benefits as well by improving access to local food.

## 1.f. Consumer Horticulture Success Stories

20XX

The XXXXXXXXXXXXXXXXXXXXXXXXXXXX Program offers compensatory programs for developmentally disabled men and women, which includes horticulture therapy and other educational opportunities. Programs are offered regularly; however, most students still lack an understanding of basic plant biology. The XXXXXXXXXXXXXXXXXXXX was a 9-week class offered by the Horticulture Agent, Horticulture Technician, Extension Master Gardeners, and the Family and Consumer Sciences Agent. The main objective of the class was to teach students about the process of growing fruits and vegetables and eating healthy foods. Each class included a brief 20 minute lecture and was followed up with a hands on demonstration to help reinforce the lesson. Classes offered included basic soil science, composting, seed development, proper fertilization, weed identification and control, harvesting, and basic garden maintenance. Students conducted science experiments and had soils analyzed by experts at the NCDA Soils Lab in Raleigh, NC. The final class concluded with a review of the entire class. Students rebuilt compost beds, planted seeds, pulled weeds, and harvested produce. Based on **qualitative assessments, students increased their knowledge on the following topics: the kinds of materials that can be composted, how to use compost, how to maintain plants with a regular watering schedule, how to identify weeds from vegetable plants, and how to have fun.**

20XX

State testing requirements and preparation for End-of-Grade (EOG) exams leads to an increase in the amount of classroom instruction and a decrease in hands-on, experiential learning. As a result, students learn about scientific processes but instruction is limited due to large numbers of students and few instructors. As a way to give students exposure to scientific learning, the XXXXXXXXXXXX County Horticulture Staff and Extension Master Gardener Volunteers hosted a "Garden Days" event in which XXX students from XXXXXXXXXXXXXXXXXXXX Middle School participated. Students rotated through different stations where they gain hands on experience on a variety of topics including, native plants and pollinators, plant division, and a plant scavenger hunt. Pre-tests were conducted prior to the visit, and post-tests were conducted approximately two weeks after their visit. **Pre- and post-test results indicated about a 60% increase in knowledge by the participants.** More importantly, students were able to experience the scientific process through hands-on learning. Teachers indicated that students were excited and were talking about their visit with other students. Teachers also indicated that they gained knowledge from their experience and would take some of the activities into their own classrooms. **For all XXX students, it was the first time they had ever visited a botanical garden.**

Community gardens are becoming very popular in the XXXXXXXXXXX. When starting a community garden not much thought is put into community development which is the key to a sustainable garden. The XXXXX workshop was developed to educate community garden leaders on how to start a garden, how to deal with insects in the garden and how to extend the garden harvest. A partnership with NC Community Garden partners and the XXXXXXXXXXX County and XXXXXXXXXXXXXXXXXXXXXXXXXXXX made this workshop possible. This workshop covered pollinator-friendly gardening and a demonstration garden was installed on the XXXXXXXXXXXXXXXXXXXX campus. The XXXXXXXXXXX County extension agent spoke about integrated pest and disease management. The XXXXXXXXXXX County horticulture technician shared her experiences in starting a community garden and the steps it took to do so. A hands on activity was used to

manage the finances of the garden. Lastly, we covered the use of season extension techniques to expand the growing season. A demonstration of those techniques was performed by the XXXXXXXXXXXX Extension agent in the XXXXXXXXXXXX vegetable garden. Thirty-eight individuals participated in this day long workshop. A survey was provided at the end of the day to all who attended. Twenty-two participants are very likely to use one of the season extension techniques that they learned about in the workshop. Twenty-three participants will use one of the integrated pest management strategies that they learned about in the workshop. Twenty-two participants will install a pollinator garden after attending this workshop. Participants got a sense of how many decisions are required when starting a community garden.

20XX

It is estimated that over 70% of eastern U.S. forests have been lost due to creation of urban and suburban areas (Brown, 2006). The population XXXXXXXXXXXX has more than doubled since 1980 and it will likely double again by the year 2040 (focussenc.org). Development has and will continue to lead to loss of native vegetation, which in turn often leads to a reduction in plant and animal species diversity (Tallamy, 2007). A lack of biodiversity decreases community resiliency, threatening water quality, healthy communities of flora and fauna, and economic drivers such as fisheries and tourism. NC State Extension and NC National Estuarine Research Reserve created the XXXXXXXXXXXXXXXXXXXX to educate local residents on their role in strengthening the environmental health and resilience in the community. Over twelve weeks presenters discussed urban ecology, biodiversity, and water quality. Participants learned how to identify urban plants and animals, discover why and how they live among us, and realize the importance they have in our urban habitat. Six guided hikes and kayaking allowed for hands-on identification of local flora, fauna and habitats. Obesity was also addressed by promoting outdoor activities such as gardening, hiking, and kayaking. Participants were evaluated using paper pre- and post-tests to measure knowledge changes. They also demonstrated concept literacy by publicly explaining aspects of a hands-on model showcasing relationships among local ecological factors. XXXXXXXX participants increased their understanding of the ecology of XXXXXXXXXXXX and how personal actions can harm or improve local natural resources. Also, **XXX people demonstrated efforts to restore 10% of their lawns into native habitats.**

The population of XXXXXXXXXXXX has more than doubled since 1980 and will likely double again by the year 2040 (focussenc.org). Development has and will continue to lead to loss of native vegetation, which in turn often leads to a reduction in plant and animal species diversity (Tallamy, 2007). A lack of biodiversity decreases community resiliency, threatening water quality, healthy communities of flora and fauna, and economic drivers such as fisheries and tourism. Needs were assessed via research and conversations with homeowners and plant vendors about the lack of both supply and demand for local native plants. Extension staff and Master Gardener Volunteers collaborated with XXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX Libraries, XXXXXXXXXXXX Magazine, and XXXXXXXX Garden Club to plan and implement the XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX. The goal of the festival was to educate the public on the importance of native plants. It was also important to showcase local native plant vendors so that the demand and supply of this vegetation could both increase. The festival also included community education booths, kids' activities, a full schedule of speakers, and a food truck. A survey was conducted as attendees arrived and left the event asked participants to rate their level of knowledge of native plants and their importance on a 7-point scale. About XXXXXXXXXXXX attendees were surveyed. **The festival resulted in a 20% average increase in attendee's perceived native plant knowledge.** The event also highlighted the future XXXXXXXXXXXX. Through interactive signage and maps, the garden will provide education for future visitors.

## 1.2. Extension Master Gardener Volunteer Program

### 1.2.a. Planning

I direct the Extension Master Gardener Volunteer Program in XXXXXXXXXXXX County and am charged with preparing volunteers to help meet the needs of home gardeners and other underserved audiences throughout the county. In the ERS system, I report on Master Gardener activities under the volunteer readiness objective, which is defined as:

Youth and adult volunteers in North Carolina contribute thousands of hours each year to strengthen communities and create strong foundations for the future. As these individuals engage in service, they are gaining new skills, generating new programs to serve their communities, building successful organizations, and fostering an ethic of service. Cooperative Extension is poised to support the development of interpersonal skills, leadership experiences, and content knowledge to ensure that citizens are prepared to engage in meaningful service throughout the lifespan. Current research suggests that youth and adult participation positively impacts civic engagement and contributes to the development of leadership capacities. With its presence in every county, Cooperative Extension is uniquely positioned to contribute to building a stronger ethic of service among youth and adults.

My first role as the agent was to gather a core group of Master Gardener Volunteers from various backgrounds together and assess what they felt should be the primary mission of the EMGV Program. Meeting three times throughout the year, we were able to first assess the expectations they had for me as the agent, as well as selecting a more purposeful direction for the EMGV Program as a whole. With members of my advisory council, which included XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX Community College, XXXXXXXXXXXXXXXX, and one other EMGV, we were able to identify goals and objectives for my horticulture program. Of those goals and objectives, one area on which I was to focus was preparing volunteers help meet the goals of Extension in XXXXXXXXXXXX County and further the efforts of the Consumer Horticulture Program.

### 1.2.b. Program Design

The challenges of gardening in XXXXXXXXXXXX, specifically within XXXXXXXXXXXXXXXX are numerous. From soil and plant selection, to landscape maintenance and pest management, gardening for new residents can be frustrating. It also may lead to non-sustainable practices that contribute to environmental pollution and decline of beneficial wildlife, including pollinating insects. In many urban, suburban, and urban/agriculture areas, water pollution is also a growing concern. Extension Master Gardener Volunteers assist home gardeners in troubleshooting lawn, landscape, or vegetable gardening challenges by providing trusted and practical solutions that improve knowledge and skills of home gardeners, and protect the overall quality of our environment.

The purpose of the Extension Master Gardener Volunteer Program is to assist North Carolina State Extension staff in addressing home horticulture-related topics to local residents in various aspects of lawn, garden and landscape care with emphasis on environmental stewardship. Volunteers assist with Extension's educational programs throughout XXXXXXXXXXXX County and extend the reach of horticulture

extension staff by providing research-based information to home gardeners. Extension Master Gardeners Volunteers are a part of North Carolina State University, a land grant institution.

### *Program Goals and Objectives*

The XXXXXXXXXXXX County Extension Master Gardener Volunteer Program equips volunteers with the knowledge and skills related to consumer horticulture.

#### *Short-term goals (1<sup>st</sup> year trainees)*

- Participants will have a better understanding of the land grant system and the role it has in reaching underserved audiences in XXXXXXXXXXXX County and throughout North Carolina;
- Participants will understand the significance of volunteerism;
- Participants will enhance their interaction with NC State Extension client base and strengthen relationships within their local communities;
- Trainees will increase their knowledge of consumer horticulture-related topics through hands-on demonstration, field trips, lectures, and peer-to-peer discussions;
- Enhance volunteer trainee experience through mentorship program, joining established committees, and class projects.

#### *Long-term goals (+2 years)*

- NC State Extension and EMGV Program will have a greater impact in XXXXXXXXXXXX County by offering more strategic educational programs that are specific to the needs of each community;
- Develop internal leadership of Master Gardener Program through a volunteer network designed to assist Extension staff in managing local Master Gardener activities and programs;
- Increase retention rate of volunteers by developing a Mentor Program that actively engages and supports new trainees and models values and mission of NC State Extension;
- More speaking engagement requests filled by a Master Gardener Speaker's Bureau from various garden clubs and residents in XXXXXXXXXXXX County;
- Elevate the prominence of the XXXXXXXXXXXX County Botanical Garden by developing new public outreach and educational programs like guided tours, hands-on workshops, and youth horticulture programs.

#### *Short-term objectives*

- 100% of new trainees will recommend extension-based resources to clients seeking home horticulture advice;
- 90% will have increased subject matter knowledge in **at least three** different topics at the end of the first year;
- 70% of volunteers will complete >30 hours of volunteer service in their first year.
- 90% retention rate of volunteers after the first year;
- 75% of volunteer trainees will participate in three or more different volunteer activities throughout the year;
- 70% of trainees will participate in **at least one** committee in their first year.

#### *Long-term objectives*

- 100% of volunteers will complete at least **20 of the required 40 service hours** within 10 miles of the communities in which they live;
- 80% of committee members will attend at least one leadership training each year;
- 80% of trainees will remain active for a minimum of **5 years** as a result of an established Mentor Program;
- At least 50% of speaker requests will be filled by a Master Gardener Speaker's Bureau.
- Increase Botanical Garden visitor attendance by 5% annually.

### *Measures of Progress*

When taking over an established EMGV Program such as the one in XXXXXXXXXXXX County, it can be difficult to gauge short-term progress. Though I have seen the advances in program s, it really had not begun to grow until the past year. **The loss of nearly half of our volunteer base could have easily swung the program in the other direction; however, in the past two years, the EMGV Program in XXXXXXXXXXXX County has become better organized and more equipped to handle questions from home gardeners.** Volunteers are better prepared to meet the challenges from a growing community of recreational gardeners. Programs offered are more diverse, but are still **focused on two primary objectives: 1) outreach, and 2) education.** New leaders have emerged in the program that have continued to boost morale while at the same time, staff are more responsive to the needs of our volunteer base. The program will continue to its strategic growth in the coming years, which will make Extension and the EMGV Program a strong force throughout XXXXXXXXXXXX County. Through this program we hope to change the general resident attitude about gardening in our region, helping to educate them on best management practices for their home landscapes. We want to provide residents with an educated and fully trained volunteer base that continues to be our force multiplier in XXXXXXXXXXXX County.

### *Evaluation Strategies*

Since 20XX, the Master Gardener Volunteer Program outcomes and impacts have been evaluated through a series of formal and informal methods, including personal conversations with Master Gardener Volunteers, as well as formal survey evaluations that measure changes in knowledge, attitude, and skills as a result of participating in the EMGV Program. Efficacy of the Master Gardener Program is measured through e-mail and phone conversations, as well as one-on-one interactions from volunteers.

## **1.2.c. Program Implementation—Outputs and Activities**

When I first assumed the responsibilities of managing the Extension Master Gardener Volunteer (EMGV) Program in XXXXXXXXXXXX County, there had not been an agent in my position for about XXX years. Assuming a leadership role within this organization was a challenge in that the majority of volunteers were accustomed to steering the program in the direction they felt was best, although not all of their objectives aligned with the mission of the land-grant system and NC State Extension. Thus, my first responsibility was focused on building relationships and trust with the Master Gardeners in XXXXXXXXXXXX County. **Throughout 20XX, I conducted formal and non-formal evaluations of the program to gather the felt and unfelt needs of volunteers and find out how I could begin to provide better leadership and direction for the overall EMGV Program.**

One of the first issues identified in 20XX was the amount of travel time for some volunteers. In XXXXXXXXXXXX County, the amount of calls or walk-ins from clients can be sporadic due to the nature of the growing season. In some instances, Master Gardeners had to drive over an hour round-trip to reach volunteer site. My advisory council and I noted the lack of Extension presence in other parts of the county and identified this as a need on which the horticulture program should be focused. As a result, we were able to select a location at a local library in the southern end of the county and set up a satellite location to provide Master Gardeners a more convenient location in which to volunteer, and a place for residents to have greater access to the services of Extension and the Master Gardener Volunteers. For the past three years, the **XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Library** has **helped to reach approximately XXX residents** living in that area. The average roundtrip miles driven for Master Gardeners and residents alike who attended the satellite location was reduced by an average of 40 total miles. We also have established a greater presence in that area of the county and have built a great working relationship with the staff of the XXXXXXXXXXXX Library. **They have reported higher turnouts for their adult and youth programs alike.** In 20XX, the Master Gardener Volunteers redesigned and installed the landscape area surrounding the library. **At the current volunteer rate of \$22.74/hour, the volunteers have contributed a total of approximately \$2,600 to the XXXXXXXXXXXX Library satellite campus.** Residents alone have **driven 24,000 less miles and saved over 500 hours of driving time** by having greater local access to extension-based resources, including the Extension Master Gardener Volunteers.

But it has not all been easy. At the end of 20XX, I gathered the Master Gardener advisory team together to discuss what changes could be made to enhance the program in the coming year. Of the issues addressed, one unanimous concern was the apparent lack of structure regarding volunteer requirements and how volunteers counted their hours. Another need addressed was the lack of participation on the MG Info Line, which is a vital and necessary component to the Consumer Horticulture Program in XXXXXXXXXXXX County. It also is essential that Horticulture Staff have Master Gardeners assist them in answering home horticulture questions. In order to provide more structure to the volunteer hours as well as provide staff with the necessary assistance, it was decided that volunteer hour requirements be placed into the program. As a result, I implemented minimum a hours requirement for both the Info Line and the Botanical Garden. The decision was met with strong opposition, and in some cases many Master Gardeners left the program. **Of the XXXXXXXXXXXX volunteers in 20XX, by the end of 20XX that number was down to XXX active volunteers.** Initially this was a difficult decision, but the positive effects have snowballed since I placed hour requirements to the EMGV Program. **In 20XX, the Info Line was fully staffed throughout the year and volunteers reached a total of XXX clients through face-to-face and call in contacts.** In 20XX, similar numbers were met as well. Volunteer hours in the botanical garden increased exponentially. As a result of greater ownership, a Botanical Garden Committee was formed in order to assist the Garden Curator with recruitment of volunteers, organize educational events in the garden, as well as provide more labor to assist the curator. Responses since the installation of the hour requirements have grown increasingly positive, and many Master Gardeners feel that the program has a better, more focused direction. Master Gardeners have stated that they now have more pride in their work and are applying knowledge gained in the program to a hands on approach by working the garden. **Follow up surveys in 20XX indicated a 30% increase in satisfaction with the program. Retention rates of volunteers also have increased by 50% each year since the implementation of hour requirements.** Master Gardeners have become more relevant throughout the county as a result of their work. County Commissioner XXXXXXXXXXXX and several other members of the community have made positive remarks regarding the enhancement of the garden.

At the end of XXXX, with guidance from a committee of Master Gardener Volunteers, I sent out an online survey to the entire EMGV Program, requesting feedback on how the program could be improved for XXXX and how Horticulture Staff could work to better meet their expectations. I initially reviewed the survey results and categorized the needs based on EMGV responses. My committee and I met over the course of 4 months to begin planning for the XXXX year. The top needs identified were: 1) more advanced training programs, 2) greater diversity of volunteer opportunities, and 3) better recruitment and retention of new Master Gardener trainees. As a result of these meetings, several new programs started in XXXX have become a mainstay of the EMGV Program in XXXXXXXXXXXX County. First, along with my Program Assistant and Master Gardener Coordinator, **we offered over 300 hours of advanced training sessions for Master Gardener Volunteers** on topics such as: *Preparing for the Info Line, Vegetable Gardening, Propagation, and Turfgrass Management*. All of these classes have helped increase personal knowledge, but 100% of Volunteers say that as a result of these trainings, that they feel better equipped to answer questions from home gardeners. Among those, **95% of volunteers have indicated a greater satisfaction with the program** and a strong likelihood that they will pass that information on to homeowners.

In XXXX, we started the “House Calls” Program, whereby Master Gardener Volunteers visit with homeowners in XXXXXXXXXXXX County who have met the challenges of gardening in coastal environments. This aligned with goal 2, mentioned previously. The program was launched in May of XXXX and ran through October XXXX. The objectives of the program were twofold: 1) **Enhance apparency of services offered by NC State Extension and EMG Volunteers, and 2) have a targeted, proactive approach to meeting underserved audiences in XXXXXXXXXXXX County**. In the first 5 months of the program, Master Gardener Volunteers **met with nearly 60 residents in XXXXXXXXXXXX County**. Follow up surveys indicated a **100% satisfaction of clients with the information provided by volunteers, as well as 90% likelihood that they would continue to seek out the services of volunteers and Extension in the future**. Several who received the “House Calls” visit signed up for the *Day in the Yard* course, which is a 6-week program taught by Master Gardeners that deals directly with the challenges of gardening in XXXXXXXXXXXX County. Surveys have indicated that Master Gardener Volunteers are more adequately prepared to deal with questions from home gardeners.

As a result of the XXXX survey, I was also able to recruit volunteers to become involved with a new Mentor Program. This aligned directly with goal 3 which was to actively recruit and retain new volunteers into the program. Prior to each class, I interviewed potential candidates interested in the EMGV Program. In XXXX, through advertisement in local newspapers, media, social media, and our county webpage, I was able to recruit 25 new trainees into the program. The mentor program was set up as a way to enhance the volunteer experience of new trainees and help better accustom them to dealing with questions from clients. In all, seven experienced volunteers were teamed up with new trainees living in nearby communities. Volunteers met on a weekly basis to provide outside training to new volunteer on topics that were not covered in class. As a result of the mentor program, a formal Mentor Committee was established at the end of XXXX, whereby Master Gardener Volunteers are actively recruited to be a part of the program. Of the new trainees, **90% indicated a great satisfaction with the mentor program** and indicated that mentors helped them to better acclimate to the program. **New trainee retention was up from 50% XXXX and 75% in XXXX; however XXXX yielded the highest short-term retention rate to 100%** of new trainees remaining active in the first year of the program.

### *Collaboration*

I have worked with other agents in my region as well as throughout the state. In XXXX, I worked with XXXXXXXXXXXXXXXX, Horticulture Agent in XXXXXXXXXXXXXXXX, XXXXXXXXXXXXXXXX, Horticulture Agent in XXXXXXXXXXXXXXXX, and XXXXXXXXXXXXXXXX, Horticulture Agent in XXXXXXXXXXXXXXXX. This collaborative group put together an advanced training course for the Extension Master Gardener Volunteers in the XXXXXXXXXXXXXXXX region. The topic was focused on available pesticides and their safe use in home landscapes. It also focused on how and what volunteers should be doing to relay this information to the general public regarding the safe and responsible use of fertilizers. It was attended by approximately XXX Master Gardener Volunteers from the XXXXX counties. My primary responsibility was to help organize the logistics of the day, developing the agenda, organizing XXXXXXXXXXXXXXXX County Master Gardeners, and helping to moderate the program throughout the day.

### *Funding and Resource Utilization*

Master Gardeners are able to sufficiently fund projects through fundraising projects such as plant sales and XXXXXXXXXXXXXXXX Program. In order to fund Botanical Garden projects, the XXXXXXXXXXXXXXXX Program requests a monetary donation that helps with the purchase of plants, irrigation installation. The XXXXXXXXXXXXXXXX Program generated **XXXXXXX of additional monies** that will help fund projects in the botanical garden.

## **1.2.d. Documented Program Outcomes and Impacts**

Between XXXX-XXXX, approximately **XXXXXXX contacts with home gardeners were made**, by face to face or phone call contacts. In those three years, approximately **18,127 hours of volunteer service were contributed to the residents in XXXXXXXXXXXXXXXX County**. At a volunteer rate of \$22.74, a total monetary **valuation of services provided by EMG Volunteers is approximated at \$412,207.98**. Volunteers have also:

- Received approximately **4,000 hours of advanced educational training** workshops;
- Traveled **5,327 hours to attend volunteer opportunities** or educational seminars;
- Given **\$6,055 in in-kind donations**;
- Reached approximately **4,000 youth through 4-H opportunities**, Life on the Farm, Hands on Horticulture, and other related youth programming.

### *Testimonials*

*I just want to say, you're doing a heck of a good job. Thank you!*  
--Fall, XXXX

*I have been a Master Gardener Volunteer for 7 years and the horticulture staff has made substantial improvements in many areas for the volunteers. You have laid a solid foundation for future Master Gardeners...I recruit new people because of your enthusiasm and commitment. THANK YOU!*  
--Fall, XXXX

*The Horticulture Staff does a great job making available many volunteer opportunities to our Master Gardeners.*

*--Fall, XXXX*

*The Master Gardener Program has always been my refuge when times get tough. A few short years ago it seemed like the group was on its way out—then you showed up. You are wise beyond your years, a born leader, and a caring friend. Because so many hard things have passed my way I don't always open up, but I feel I can always talk to you.*

*--Winter, XXXX*

## 1.e. Societal Benefits

The Extension Master Gardener Program in XXXXXXXXXXXX County will increase horticultural knowledge of residents in XXXXXXXXXXXX County by providing research-based information from horticulture staff. Our volunteers will assist homeowners with applying best management practices for home lawns as well as community vegetable gardens. They will offer strategic programs that are specific to the needs of local communities and will be an essential part in helping to direct the focus of the horticulture program in XXXXXXXXXXXX County. Volunteers will continue to be a force multiplier of our efforts and will help improve the presence of NC State Extension in our county. Volunteers develop skills they use in other local organizations. **To date, six EMGV leaders have served as executives on other local boards with these Extension Volunteer leadership skills.**

## 1.f. Master Gardener Volunteer Program Success Stories

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Extension trains Master Gardeners to answer resident's gardening questions. As representatives of NCCE, it is critical Master Gardeners are able to provide accurate and up to date information, yet many volunteers feel they lack the knowledge necessary to serve in this capacity. In addition, pesticide products are constantly changing, adding to the challenge of providing up to date recommendations. XXXXXXXX County Extension Master Gardeners surveyed garden centers in southeastern NC to determine which pesticide products are currently available to home gardeners in the region. The information from this survey was used to develop a regional training class that addressed pesticide safety and labeling, different products and their active ingredients, and the differences between natural and synthetic pest control materials. XXXXXXXX Master Gardeners from XXXXXXXX, XXXXXXXX, XXXXXXXX, and XXXXXXXXXXXX counties attended the regional advanced training. Following the event, participants were invited by email to take an online evaluation survey, which was completed by XX attendees. Ninety eight percent of attendees who completed the survey reported they were satisfied with the quality of the class. **One hundred percent indicated they gained skills and knowledge related to pesticide use, safety, and selection, while 76% reported a definite increase in confidence to make pesticide recommendations to the public.** Participation in this training has enabled volunteers to provide more accurate and up to date recommendations for pesticides, including natural or organic alternatives. Proper use of pesticides and selection of less toxic products protects surface and ground water and reduces potential negative impacts to humans, pets, and wildlife.

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XXXXXXXXXXXX County is the fastest-growing county in NC, and as the housing market grows, it is necessary for Horticulture Staff to train and better prepare Extension Master Gardeners so they remain a viable outreach component of NCCES in the field of consumer horticulture. Horticulture Staff evaluated current programming efforts of the EMGV program to discern knowledge gaps of volunteers, and to determine the types of programs and advanced trainings we would offer in XXXX. A group of MG Volunteers was assembled to help refocus our educational and outreach efforts to align with the vision plan for NCCES and the needs of XXXXXXXXXXXX County residents. The intent was to create new and more efficient ways for volunteers to achieve their required service hours, while still maintaining a high quality of customer service to residents of XXXXXXXXXXXX County. Over XX volunteers completed an electronic survey. All responses were reviewed individually and each was considered in the XXXX planning process. The evaluation results and planning committee developed three advanced training courses for XXXX. The intent of this training is to provide volunteers with the hands-on and experiential learning that will better equip them to answer consumer horticulture questions. A Master Gardener Consultation program will also be offered, whereby volunteer teams will learn to provide horticulture consultations to residents upon request. We plan to charge a fee for each consultation, which will be used to enhance aesthetics of the XXXXXXXXXXXX County Botanical Garden as well as educational efforts for residents, landscape professionals, and Master Gardeners.

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Master Gardener Volunteers assist horticulture staff in fielding home gardening questions from residents throughout XXXXXXXXXXXX County. As the fastest-growing county in the state, a growing housing market, and an increased interest in home gardening and landscaping, it is necessary to equip volunteers with necessary information that is relevant and up-to-date so they can better assist the residents of XXXXXXXXXXXX County. Volunteers are the force multiplier of NC State Extension and must be prepared to diffuse up-to-date information. Throughout the spring of XXXX, approximately 100 hours of advanced training sessions and workshops were offered by horticulture staff in the areas of: propagation, pruning, vegetable gardening, info line, and turfgrass. Data was collected in XXXX through formal online evaluations, as well as through informal surveys and face-to-face interaction with MG Volunteers. Horticulture staff and a steering committee of XX Master Gardeners planned XXXX to meet the needs of staff as well as volunteers. Approximately XX volunteers completed the survey. As a result of the advanced trainings, **100% of Master Gardeners felt better prepared to deal with clientele and answer more advanced questions** related to home horticulture. Based on informal interactions and through observation, Master Gardeners are more involved in the program and have more of a stake in participating in the program. **New programs like XXXXXXXXXXXX are offered as a result of the advanced training sessions. At least 80% of volunteers feel better equipped to answer questions from clients.**

## 1.3. Commercial Horticulture Program

### 1.3.a. Planning

I direct the Commercial Horticulture Program in XXXXXXXXXXXX County with guidance from my advisory committee. I report under the Urban and Consumer Agriculture objective in the Employee Reporting System (ERS). Urban and Consumer Agriculture is defined as:

Residential, commercial and public entities will make decisions regarding plant selection, placement and management that will decrease water consumption, preserve and improve water quality, mitigate storm water contaminants, reduce erosion, energy consumption, and greenwaste, expand wildlife habitat, improve real estate value, and improve diet and nutrition of consumers. Over 50% of the population now lives in urban areas. Despite evidence of the ecological and financial benefits, environmentally responsible landscaping strategies are not being implemented widely. Renovating a landscape to incorporate water conserving strategies may result in using 36% less water. Urban water run-off accounts for the majority of water pollution, mostly pesticides and fertilizers that does not come from a specific industrial source. Selection of well-adapted plants, effective pest management, and appropriate care and feeding of plants will greatly reduce dependence on fertilizers and pesticides. Rain water that is not absorbed by the soil becomes erosive storm water runoff, which transports pollutants such as fertilizer, pesticides, sediment, motor oil, litter, and animal waste to local streams and rivers. Landscape designs will include rain gardens and other runoff catchment facilities (underground cisterns, etc.) that are attractive and easy to maintain in residential areas. Homeowners will learn that proper plant selection and placement can reduce winter heating bills by as much as 15% and summer cooling bills by as much as 50 percent, while reducing the need to prune over-sized plants. Wild habitat areas are rapidly being converted into housing and commercial properties, displacing native plants and animals. Choosing native or adapted plants that provide food and shelter creates a haven for butterflies, birds, lizards, and other animals. Edible landscaping can increase the amount and expand the variety of fresh fruits and vegetables consumed.

When I first took the role as the Commercial Horticulture Agent in XXXXXXXXXXXX County, I started by providing instruction to and advising professionals serving the Green Industry, including landscapers, golf course managers, and nurserymen, as well as those farmers growing horticultural crops. XXXXXXXXXXXX County currently has 45,000 acres of land in agricultural production and ranked 60<sup>th</sup> in agriculture cash receipts, totaling approximately \$55 million in XXXX. The approximate value for horticulture crops (vegetables, fruits, nuts, and berries) is \$6.3 million annually, which ranks XXXXXXXXXXXX County 22<sup>nd</sup> in the state. Commercial nursery, greenhouse, and floriculture production in XXXXXXXXXXXX County currently ranks 46<sup>th</sup> in North Carolina, with a valuation of \$3.3 million dollars in gross income (Agriculture Statistics-XXXX Annual Statistics Book, XXXX). All total, horticultural crops in XXXXXXXXXXXX County have an estimated value of \$9.6 million in annual income (Agriculture Statistics-XXXX Annual Statistics Book, XXXX).

I assessed my program and determined what needs were not being met by utilizing members of my advisory council, horticulture professionals, and instructors from XXXXXXXXXXXX Community College. *Horticulture* in XXXXXXXXXXXX County encompasses a very large group of “Green Industry” Professionals and farmers, so my programs have to be as comprehensive as possible, yet must be ready to meet the

specific and varied needs of each of these groups. I met with former agents who had worked in XXXXXXXXXXXX County and asked them about programs that had been successful, as well as ones that had been more challenging to implement. In order to develop effective programming, I first utilized the 2012 XXXXXXXXXXXX County Needs Assessment that had identified Urban and Consumer Horticulture as a priority on which to focus my program. I further identified the key stakeholders throughout the county that could provide necessary feedback to help me plan effective and timely commercial horticulture programs.

### 1.3.b. Design

During the planning process in XXXX, the advisory council and my County Extension Director identified three major areas on which my program should focus. First, it was noted that farmers and landscapers alike needed more research-based information on emerging industry trends that would help them maximize their profits and potentially reduce off-farm inputs. Secondly, more programming related to pesticide education and safety. The program needed to focus on increasing knowledge and skills of farmers and green industry professionals and emphasize integrated solutions to pest management in urban and agricultural systems. It also needed to stress protection of the environment, and most importantly, of the workers who are exposed to pesticides, while enhancing economic viability for the green and agricultural industries. As a result of these directives, I was able to identify four main objectives that would adequately address both of the identified goals.

#### *Program Goals and Objectives*

##### *Short-term goals (1-12 months)*

- Participants will increase their knowledge of basic cultural maintenance practices for residential and commercial landscapes.
- Participants will have a better understanding of IPM strategies that enhance economics and the environment, and reduce chemical inputs.
- Individuals serving the green industry will increase their knowledge of landscape plants, their care and maintenance, and pest problems for each.
- Through hands-on demonstration, participants will have better knowledge of landscape and nursery pests, their identification, and different control options for their management.
- Individuals will have a working knowledge of the AgChem Manual.
- Participants will enhance their interaction with client base and strengthen customer service relationships.
- Provide more programming for landscapers and nurserymen on the assessment and diagnosis of landscape pests and how to make treatments based on documented IPM practices;
- Increase awareness of farmers and green industry professionals on plant selections and varieties that work well in a coastal climate;
- Enhance worker safety by providing more pesticide education programs for farm and landscape workers, including a bilingual pesticide training program.

##### *Long-term goals (Two years)*

- Increased ability of landscapers to assess and diagnose landscape issues, and make treatments based on *documented* IPM practices.

- Increased knowledge of plants suited to the Cape Fear Region and cultural maintenance practices using the XXXXXXXXXXXX County Botanical Garden as an outdoor training facility.
- Nursery and landscape business will increase profitability of their operations through the use of:
  - Documented IPM Strategies
  - Reduction of number of pesticide applications
  - Reduction of non-sustainable land management practices

*Short-term objectives*

- 100% of participants will increase knowledge of basic cultural maintenance practices for residential and commercial landscapes;
- 85% of participants will adopt at least one new IPM strategy including pesticide rotation and selection of disease-resistant plant varieties;
- 70% of participants will identify common nursery/landscape pests, and use the AgChem manual to make control recommendations;
- Using the XXXXXXXXXXXX County Botanical Garden, 50% of individuals serving the Green Industry will identify at least 10 common landscape plants;
- 40% of Individuals in the green industry will state the cultural maintenance practices (i.e. pruning, fertilizing, etc.) for at least 5 of the 10 plants.

*Long term objectives*

- 70% of landscapers and nurserymen will be more proactive in addressing commercial and landscape issues, including proper plant selection and pruning requirements;
- 50% of individuals in the green industry will document IPM strategies taken to mitigate pest damage and reduce pesticide applications;
- 50% of individuals in the green industry will become use the Botanical Garden of XXXXXXXXXXXX County for the Certified Plant Professional exam;
- 50% of participants will effectively communicate and enhance customer relationships by developing soft skills of their workforce.

*Measures of Progress*

I am constantly seeking to improve my Commercial Horticulture Program, and in order to do that, I evaluate all programs taught to green industry professionals and farmers alike. I use traditional surveys to see what, if any changes need to be made, whether there is an increase in gained knowledge, and whether participants intend to adopt or change a particular behavior. In some instances, it is difficult to measure program impacts through paper evaluations. I also look at the professional relationships that I have developed since XXXX and measure the growth of my program in that regard. In three years, my program has started to reach more individuals working in the Green Industry and on farms by offering onsite trainings and moving away from having trainings only at our county office. I am reaching people with a more targeted approach and have built a strong relationship with landscapers, nurserymen, and farmers as a result.

*Evaluation Methods*

Since XXXX, the Commercial Horticulture Program outcomes and impacts have been evaluated through a series of formal and informal methods, including personal conversations with landscapers, nurserymen,

and farmers, as well as formal survey evaluations that measure changes in knowledge, attitude, and skills obtained from attending a particular training. Efficacy of the Commercial Horticulture Program is measured through e-mail and phone conversations, as well as one-on-one interactions from program participants.

### 1.3.c. Program Implementation—Outputs and Activities

XXXXXXXXXX County is the XXXXXXXXXXXXX county in North Carolina. The rapid expansion of the housing market in the last 5 years has placed significant pressure on many of the natural areas throughout XXXXXXXXXXXXX County. Often, large tracts of land are clear cut to make room for development of these communities. The loss of native plant species and wildlife habitat is a growing concern in our area, especially considering that XXXXXXXXXXXXX County has some of the highest species biodiversity found anywhere in the state, country, and world. It is home to several globally endangered plant species such as the venus flytrap and pitcher plant. In August, XXXX County Planning Director, Mike Hargett, approached Extension in XXXXXXXXXXXXX County, needing help with the update of the “tree section” of the XXXX unified development ordinance (UDO). County planners wanted to provide guidance for site designers in terms of best management practices for protection and conservation of tree resources. Evaluations for this type of consultation were benchmarked with observations throughout the development of the project. After several months of revisions, **the new ordinance was adopted by the County Commissioners in March, XXXX**. Extension Staff provided flexibility in the ordinance to promote quality development through the use of proven design principles and best management practices without restricting good design. We expanded the list of heritage tree species, and included recommendations for site surveys of species present prior to development. Provisions also included recommendations for selective removal of trees in lieu of clear cutting, vegetative buffers around bodies of water, and suggestions for replacing and maintaining contiguous habitat buffers for wildlife. The result is that smart growth of XXXXXXXXXXXXX County can occur, and the preservation of our natural and cultural heritage will remain intact.

Commercial shiitake mushroom production is quickly becoming a viable, and low-input enterprise for growers interested in alternative crops with high market value. For the past two years, shiitake mushroom workshops have been offered in XXXXXXXXXXXXX County to those interested in growing mushrooms commercially or for hobby growers. The program was offered for the first time in February of XXXX and was attended by nearly 60 participants. As a result of this first workshop, four farmers started growing mushrooms for commercial production and all are currently in their second year of production. In the spring of XXXX, two workshops were held at the XXXXXXXXXXXXX County Center, and one in XXXXXXXXX County. All total, these workshops reached approximately **XXX people, 10 of whom are now beginning commercial production of shiitake mushrooms**. Not only are these farmers growing shiitake mushrooms, **but XXXXXXXXXXXX are beginning farmers under 35 years of age** who live throughout XXXXXXXXX, XXXXXXXXX, XXXXXXXXXXXXX, and XXXXXXXXX Counties. This workshop was a partnership with NC A&T University who delivered the first-year training and have provided free mushroom spawn to beginning farmers for the past two years.

Commercial and private pesticide applicators are required to have recertification credits every 5<sup>th</sup> and 3<sup>rd</sup> year, respectively. Oftentimes, individuals forget they need to be recertified and run the risk of losing their applicator’s license, or they face time constraints to attend multiple trainings in any given year. Since XXXX, I have offered approximately 45 hours of pesticide recertification courses to nearly 300 green industry professionals, and to 60 farmers throughout XXXXXXXXXXXXX, XXXXXXXXX, XXXXXXXXX, and XXXXXXXXX Counties. I have collaborated with the Horticulture Department at XXXXXXXXXXXXX Community

College to offer “ProDay” in XXXX and XXXX. This event brings in specialists from NC State Extension who serve the green industry, and has reached nearly XXX licensed pesticide applicators from multiple counties. **In XXXX, 90% of private pesticide applicators received all of their recertification credits in XXXXXXXXXXXX County.** Though there are many individuals who are paid to maintain commercial and private properties, many lack any type of formal training. I most recently collaborated with NC Agrability to do a one-hour seminar on farm worker safety and protection. I have developed a list serve that e-mails participants about upcoming trainings, as well as a traditional mailing list that goes out to private and commercial applicators who are in need of recertification credits that year. As a result, **100% of attendees indicated a very high satisfaction with the notification system.** Of those, **95% were very satisfied with the frequency and timing in which programs were offered during the year.**

In XXXX I was contacted by a wholesale nursery that was losing a significant portion of some of their highest-value plants. An experienced grower, this individual had no way of contacting the Plant Disease and Insect Clinic in Raleigh and so called me to help diagnose the decline of his container plants. After investigating one crop of plants, we are able to determine that the cause was not detrimental to the crop, which saved him approximately XXXXXXXXXXXX in lost plant material. The second crop investigated was tested for root disease and samples were sent to Raleigh for analysis. The samples confirmed that a disease had caused the decline and could easily spread to other plants near the infected crop. Though the grower lost those plants, he was able to save the remainder of his plants by following the recommendations for proper disposal of plant material. Throughout our conversation, this individual expressed a frustration with the amount of travel time required to attend pesticide trainings, as well as a significant language barrier between himself and his Hispanic workers. To address this need, the Commercial Horticulture Program, in XXXX, began doing onsite pesticide and plant diagnosis trainings throughout XXXXXXXXXXXX County. Though it is relatively new, the **onsite trainings have reached newer audiences** throughout the county that were not previously aware of NC State Extension’s resources.

In order to prepare local vegetable producers for upcoming growing season, I have collaborated with the county FCS agent to organize and deliver production workshops specifically related to the identified needs of XXXXXXXXXXXX County farmers. I have helped plan and implement workshops for growers who sell at our local farmers markets, most of whom are limited resource growers who stand to benefit the most from sustainable agricultural practices. I delivered workshops on spring and summer vegetable selections with an emphasis on disease-resistant and drought-tolerant varieties, high tunnel production, and cover crop demonstrations. This hands-on workshop promoted season extension which can be economically and environmentally sustainable.

In January of XXXX, I taught two workshops on cover crops and high tunnel production for 13 small-scale farmers from XXXXXXXX, XXXXXXXX, and XXXXXXXXXXXX Counties. Results from the cover crop workshop indicated that 80% of participants increased knowledge of cover crops, their benefits, how to adjust planting dates for implementing cover crops into cash crops, as well as the drawbacks of cover crops. Of those XX participants, all XX indicated a willingness to investigate more opportunities to develop extensive cover crop rotations on their farm, while at least XX participants indicated that they would implement at least one cover crop into their farming operation. A total of XX participants indicated an interest in participating in on-farm research programs through NC State Extension, SARE, and/or other research-based organizations. At least XX participants indicated an interest in alternative and sustainable horticulture crops and production practices for their farm.

## *Educational Strategies*

As demographics change in XXXXXXXXXXXX County, effective delivery of educational programs can be a challenge. In order to meet the growing diversity of our participants and their educational needs, the Commercial Horticulture Program offers different educational delivery methods to effectively train and prepare farmers and green industry professionals. Instructors will be chosen based on their ability to effectively teach an educational objective that meets with the desired outcome of the trainings. Each class is tailored to meet the variety of learning preferences for participants. Some example of trainings offered include:

- Powerpoint presentations (utilizes Audience Response Interactive Software):
  - Pesticide label updates
  - Pollinator protection
  - Integrated pest management strategies for green and agricultural industries
  - Cover crop management for farmers
  - Weed, Insect, and Disease updates
  
- Hands on/interactive sessions:
  - Pest identification (practicals) with AgChem Manual
  - Calibration exercises
  - Customer Interaction/Soft skills development
  - Plantsman's Tour (Botanical Garden)
  
- Field trips
- Offsite trainings at a host site
- Participant-led discussions
- Trainings for Spanish speakers

## *Collaboration*

I have collaborated extensively in order to better strengthen my Commercial Horticulture Program. In XXXX, I was able to certify approximately XXXXXXXX private pesticide applicators in XXXXXXXXXXXX County. However, it was only accomplished because of collaborative partners such as XXXXXXXXXXXXXXXX of XXXXXXXX and XXXXXXXXXXXXXXXX Counties, respectively; XXXXXXXXXXXX, regional pesticide inspector with the NC Dept. of Agriculture, and XXXXXXXXXXXXXXXX, a statewide program that is based out of XXXXXXXXXXXX, NC. My primary roles included organizing and planning classes for private applicators, as well teaching the classes. I organized speakers and arranged for topics that were up-to-date and relevant for the learners. I also collaborated with XXXXXXXXXXXXXXXXXXXXXXXX of the Horticulture Department at XXXXXXXXXXXX Community College in XXXX and XXXX to organize XXXXXX, a 5-hour recertification course for the commercial pesticide applicators throughout XXXXXXXXXXXXXXXX. In those two years, approximately XXX commercial pesticide applicators were recertified.

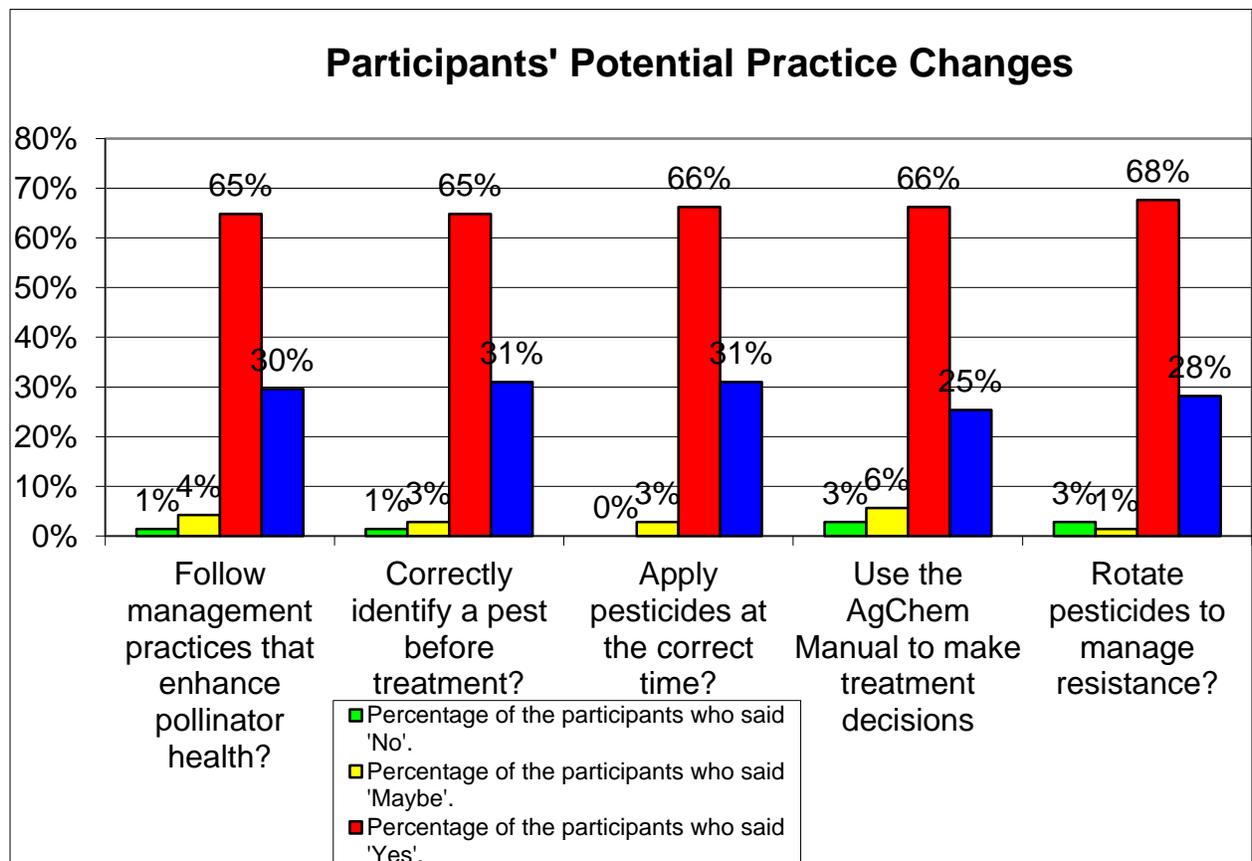
*Funding and Resource Utilization*

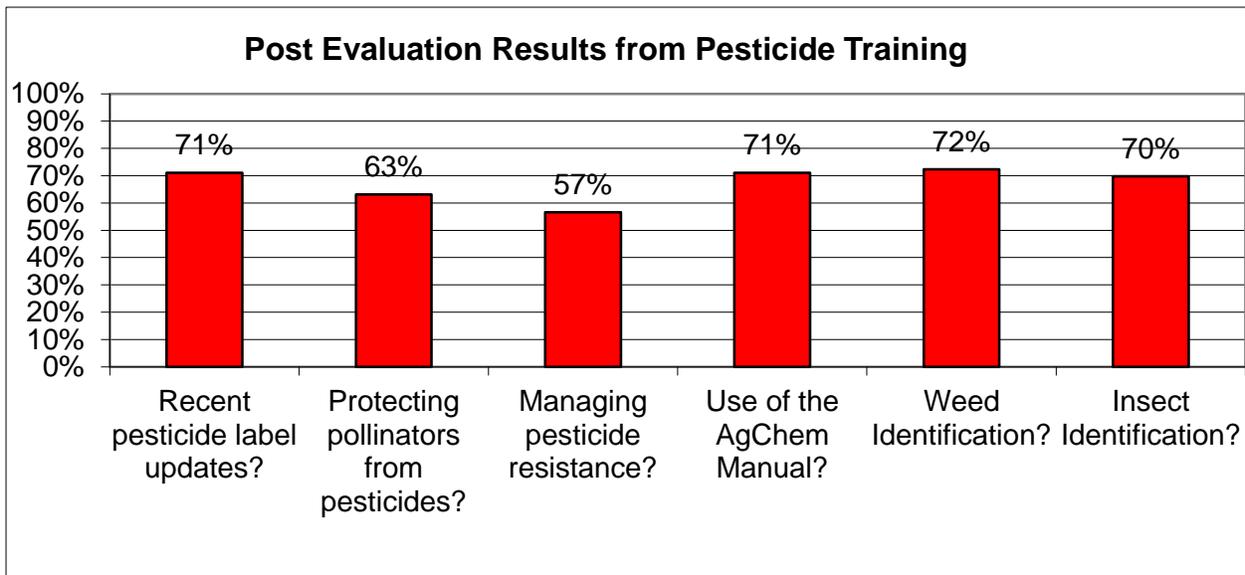
Funding is traditionally provided to my overall horticulture program through county budget funds, and I am normally able to fund most of my program needs with those monies. However, other funding sources include those that come from class fees, which brought in approximately XXXXXXXX to my program for the past three years. Sponsors of my programs also have included XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.

**1.3.d. Documented Program Outcomes and Impacts**

Between XXXX-XXXX, approximately **XXX contacts were made with professional landscapers and farmers**, by face to face or phone call contacts. In those three years, approximately **50 hours of farm and landscape pesticide recertification and advanced training courses were offered**. At a valuation of \$40, a total monetary **valuation of services provided by the Commercial Horticulture Program is approximated at XXXXX**. The commercial horticulture program has also:

- **80% of participants** with improved knowledge on insect pest management;
- **75% of participants** who increased knowledge of weed management;
- **75% of participants** who increased knowledge of proper use of the AgChem Manual;
- **76% participants** who **planned to rotate pesticides to reduce resistance**;
- **890 participants** who said they would seek extension-based information for help in troubleshooting pest problems;
- **Reduced of 38 tons of greenwaste** (biodegradable, compostable plant materials) as a result of Extension-based recommendations.
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### 1.3.e. Societal Benefits

The Commercial Horticulture Program in XXXXXXXXXXXX County will continue to deliver effective and up-to-date programs for those professionals and farmers serving the green industry in XXXXXXXXXXXX County. They will become more profitable by appropriately and effectively utilizing IPM into their programs, increase profitability by selecting new horticultural crops that have a high return on their investment, and investigating new ways in which to conserve natural resources on their farm or in their landscape operation.

### 1.3.f. Program Success Stories

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Landscape professionals and turfgrass managers are required to complete at least 10 hours of pesticide re-certification credits in order to maintain a commercial pesticide applicator's license. The Horticulture/Agriculture Agent is often charged with teaching re-certification classes. Classes are often based heavily around lectures with limited involvement and interaction with the participants. In XXXX, the Horticulture and Agriculture Agents taught re-certification classes with Audience Response Software (ARS) or "clicker training." A presenter may ask a question during a talk and ARS allows participants to "click" in their answers anonymously. This creates more active participation during class and often facilitates discussion among participants and with the speaker. A survey was completed following each workshop and in three classes, an average of **75% of participants were "very satisfied" with ARS and 80% said that ARS "contributed a lot"** to their knowledge of subject matter. Pre and post evaluation results of 'very knowledgeable' increased from 0% to 67%. Agents also offered hands on activities like equipment calibration and weed identification. One participant said, "This was the best pesticide training I have ever attended."

XXXXXXXXXXXX County's Agricultural and Green Industries have an economic impact of XXXXXXXXXXXX annually with approximately XXXXXXXXXXXX acres of land in production and XXXXXXXXXXXX employees. Because of the magnitude of an industry where the application of pesticides and fertilizers is necessary, the economic and environmental impacts from the appropriate and responsible use of pesticides are critical. In

October of XXXX, Fall ProDay was held at XXXXXXXXXXXX Community College and was attended by over XXX certified pesticide applicators from multiple counties in the XXXXXXXXXXXX District, which made it the most-attended in the 5-year history of this annual event in XXXXXXXXXXXX County. XXXXXXXX is a collaborative effort between Cooperative Extension and XXXXXXXXXXXX Community College Dept. of Horticulture; the planning and implementation of this program strengthened a waning relationship with Horticulture Instructors from BCC. Extension staff also collaborated for this event, with presentations from 4 agents from different disciplines during breakout sessions. Local Businesses also contributed by sponsoring portions of the event through financial donations. Impacts of the program were evidenced by electronic and paper evaluations. Of the attendees, 90% were very satisfied with the quality of the event and 80% stated that they had planned to implement practices and recommendations based on what they had learned during the event. **This translates to a more responsible use of pesticides and best management practices by the applicators and leads to monetary and environmental savings.** We were personally thanked by attendees who said that the XXXX XXXXXXXXXXXX was the best they had ever attended.

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The Green Industry in XXXXXXXXXXXX County serves thousands of homeowners each year, employing many of its own residents. Commercial landscapers and private pesticide applicators are required to renew re-certification credits periodically. This year Cooperative Extension offered a total of **17 hours of re-certification credits, serving approximately XXXX private and commercial applicators**, XX of who needed their credits by the end of September. We were able to reach participants in both public and private industries. Because the green industry is so large, and with many farmers also in the county, and many more homeowners applying pesticides, the recycling of plastic pesticide containers is of utmost importance in order to protect XXXXXXXXXXXX County's natural resources. For the container recycling program, we were able to reach the private sector. We were able to show from our classes that private and public applicators gained knowledge and planned to implement many of our recommendations into their own practices. We conducted pre- and post-evaluations, with many participants increasing knowledge. Containers were weighed when collected by our recycling partner. Our programs benefit the private and public applicators, as well as the residents of XXXXXXXXXXXX County. **Because we showed a learning increase in how to properly dispose of containers, we are able also to remove 1200 pounds of pesticide containers from the XXXXXXXXXXXX County waste stream.**

Private pesticide applicators in XXXXXXXXXXXX County depend on the safe and effective use of pesticides to efficiently and effectively run their farming operations. XXXXXXXXXXXX County currently has XX certified private pesticide applicators who currently are involved with farming in some fashion. The responsibility falls on Cooperative Extension staff to train applicators on the most up-to-date information and personal safety practices for applying pesticides. This year, XX private pesticide applicators were due for re-certification. In XXXXXXXXXXXX County, Cooperative Extension offered three, 4-hour trainings throughout the year. We mailed letters to private applicators notifying them of our upcoming classes, as well as classes in other counties that might provide a more convenient location. We partnered with XXXXXXXX, XXXXXXXX, and XXXXXXXX Counties to work to make the class sites more convenient for applicators who live close to these sites. We monitor the NCDA Pesticides section to see which applicators need their re-certification credits. Pesticide credits are due by September 30, and through letters, phone calls, and training classes, we were able to re-certify all XX farmers for the XXXX year. Electronic Audience Response Devices are used in conjunction with on-screen evaluations to measure participant learning during each course. Our classes were well-received, with **100% of participants indicating an increase in**

**knowledge gained, and 50% indicating they would change some aspect of their current practices** because of our classes. Through verbal communication, several attendees stated that our classes were the most worthwhile, engaging and entertaining pesticide trainings they had ever attended.

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Commercial shiitake mushroom production is a viable, and low-input enterprise for growers interested in alternative crops with high market value. For the past two years, shiitake mushroom workshops have been offered to those interested in commercial and home mushroom production in XXXXXXXXXXXX. For limited resource farmers, shiitake mushroom production affords a sustainable, high value product that can be sold to food retailers such as XXXXXXXXXXXXXXXXXXXX, and local farmers markets at a premium price. This unique niche crop offers economic and environmentally sustainable alternatives to traditional horticulture crops. Three shiitake workshops were offered in XXXX. NC State Extension provided the training, spawn, and other materials including oak and sweet gum logs, and NC A&T provided spawn for beginning mushroom farmers free of charge. The XXXXXXXXXXXX County center loaned tools for drilling and inoculating logs for those who could not afford the upfront cost of tools. Written pre-evaluations were completed by 95% of participants. Follow-up surveys for commercial growers were provided by NC A&T and took place in the form of on-site visits and through paper surveys. 50% of commercial growers completed the informal post-evaluation survey. Informal assessments were made through face-to-face contact as well as through follow-up phone calls with clients. **Approximately 80% of participants are growing mushrooms, either for home or commercial production.** XX participants are growing mushrooms for commercial production. Of those, X are beginning farmers under 35 years of age who live in XXXXXXXXXXXX, XXXXXXXX, XXXXXXXX, and XXXXXXXX Counties.

Local small farmers who direct market their produce asked XXXXXXXXXXXX County Extension staff for training specific to their needs at the end of the farmers market season in XXXX. Topics they requested included vegetable variety selection and season extension techniques. As a result, a series of educational events was developed for the winter of XXXX by Agriculture, FCS and Horticulture agents to address production, marketing and agribusiness issues unique to this local audience composed primarily of limited resource individuals in underserved audiences. Additional topics were added by the educators based on their observations of local farmers markets to encourage producers to take advantage of new opportunities and avoid problems. Participants were observed and assessed before and after the series for their market displays, produce quality/availability throughout the seasons, as well as production techniques for some growers. Twelve local growers participated in this course with 6 of these completing the series. **All of the participants who completed the series significantly improved their marketing techniques. One grower installed a high tunnel after the season extension class in order to have produce earlier and later in the season. Two growers took advantage of new market opportunities and one used information learned during the business planning workshop to reduce tax liabilities in her family's operation.** This series was exactly what the clients requested and was made available to others so that everyone involved benefited from the increase in knowledge and the public who purchases food from these growers has a higher quality, longer lasting food supply from local farmers.

XXXXXXXXXXXX County is the fastest growing county in the state, and 30th in the nation. The housing market is rapidly growing in this county, and often times land is cleared in vast tracts to make room for housing developments. The loss of native plant species and wildlife habitat is a growing concern, especially in this area, where species biodiversity is one of the highest in the world according to the Nature Conservancy. County Planning Director XXXXXXXXXXXX approached Extension in XXXXXXXXXXXX County

about helping with the XXXX update of the county unified development ordinance (UDO) pertaining to trees. County planners wanted to provide guidance for site designers in terms of best management practices for protection and conservation of tree resources. The audience in this case was twofold: XXXXXXXXXXXX County planners and builders who develop land in this area. A timeline was developed and benchmarked with observations throughout the project.

The Certified Crop Adviser (CCA) program is an American Society of Agronomy agriculture professional certification program. To maintain certification, CCAs must receive 40 best management practice educational credits every 2 years. Since 2000, the North Carolina Cooperative Extension XXXXXXXX District Agricultural Agents have planned and hosted an annual XXXXXXXX NC CCA Training to offer continuing education credits. A 2.5-day XXXXXXXXXXXX NC CCA Training was conducted and offered 20 Continuing Education Units (CEUs). XXXXXXXX CCAs, consisting primarily of North Carolina agricultural dealers, pesticide/seed sales representatives, and other agencies from throughout North Carolina, South Carolina, and Virginia, attended the XXXXXXXX NC CCA Training. Evaluation was collected at the end of the training via a post-training survey. XXXXXXXX participants completed the survey; and offered feedback for next years' training such as topic and speaker suggestions. In the post-evaluation, **98% of participants noted training information was relevant to their needs.** One hundred percent of participants recorded the training met their expectations and stated they would recommend this training to others. **99% of participants stated that they were satisfied or very satisfied with the overall quality of the training.** If we didn't offer this opportunity, CCA's would have to receive continuing education in other parts of the country or complete online self-study courses. If a CCA had to take classes online compared to what we offer over a 2.5 day time frame, it would cost him or her around \$500 to earn 20 hours of CEUs and CCA's would miss out on the networking opportunity. **In the end, we just saved our CCA audience over XXXXXXXXXXXX.**

## II. Marketing of NC State Extension and University Engagement

**What have you done to favorably position the organization and the university in your county, region/district, and state?**

Since XXXX, I have actively promoted Extension through a variety of news and media outlets, as well as through speaking engagements. The following are a sampling of some of the ways in which I favorably positioned NC State Extension in XXXXXXXXXXXX County:

- 52 Newspaper articles published in 4 separate news outlets with an approximate distribution of 100,000 people;
- 52 articles published for the XXXXXXXXXXXX County webpage, with 47,824 articles viewed by readers;
- 6 articles published in the Extension Gardener Newsletter, a circulation of about 4,000 subscribed readers;
- 12 quarterly publications to a listserve of approximately 400 readers in XXXXXXXXXXXX County;
- 4 television appearances;
- 3 regional radio interviews; 2 appearances on NPR, and 1 for a local station.

I have delivered numerous presentations to a variety of professional and non-professional interest groups. Some of my presentations include, but are not limited to:

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- *An Introduction to Honey Bees*; presented to XXXXXXXXXXXX Club;
- *The Effects of Lawn Plant Diversity on Arthropod Diversity*; presented at the XXXXXXXXXXXX Sci. meeting, July XXXX;
- *Pesticide Sprayer Calibration*; hands on presentation at XXXXXXXXXXXX;

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- *Entomology*; presented to XXXXXXXXXXXX and XXXXXXXXXXXX County Master Gardener Training classes;
- *Plant Disease Ecology: Identification and Control*; presented to XXXXXXXXX County Master Gardener Training class;
- *Careers in Horticulture*; presented to XXXXXXXXXXXX Middle School and XXXXXXXXXXXX High School;
- *Monitoring Ambrosia Beetles in XXXXXXXXXXXX County*; presented to XXXXXXXXXXXXXXXXXXXX;
- *Shiitake Mushroom Production in XXXXXXXXXXXX County*; presented to those interested in growing shiitakes for commercial production;

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- *Plants, Pollinators, and Integrated Pest Management*; Presented at GROW Community Garden workshop;
- *Native Plants for Oak Island*; presented for general public in XXXXXXXXXXXX;
- *Spring Vegetables for Fresh Market*; presented to farmers growing produce for local Farmers Market;
- *Native Plants for Coastal NC*; presented for general public at Native Plant Festival;
- *Plants and Ponds: Managing ponds for aesthetic and environmental enrichment*; presented to XXXXXXXXXXXX and the general public;
- *Managing Resistance in your Farming Operation*; presented to private pesticide applicators;
- *Mitigating Pesticide Drift*; presented to private pesticide applicators.

**How has the public's image of Extension been enhanced by your efforts?**

I strive continually to promote the land-grant university system, NC State Extension, and the multitude of programs and services that are offered for the residents of XXXXXXXXXXXX County. Whenever I give a presentation to a group of individuals, I will give a brief synopsis of the land-grant university system, how it was established, and what it looks like in terms of services offered today. I make it a point to understand all of the different programs that exist within the extension organization and continually promote other programs that are involved with youth enrichment (4-H), family development (FCS), natural resources, and agriculture. My priority at each and every event is to professionally reflect the values set forth by the land grant charters and accurately relay research-based information that is generated throughout the extension

system. I use my weekly columns as a springboard to promote other programs outside of horticulture so that all readers will become more familiar with how extension can meet their specific needs.

**How did you work with agent(s) in securing resources?**

I collaborate with other agents as much as possible, whether for professional development, or for programs that enrich the knowledge of the general public or Master Gardener Volunteers. I look to obtain resources within XXXXXXXXXXXX County as much as possible and that includes: XXXXXXXXXXXX, XXXXXXXXXXXX Community College, Master Gardener Volunteer Association, XXXX, Home Depot, Lowe's, XXXXXXXXXXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX, and more.

**What cross-disciplinary efforts and programs were you involved with?**

I have worked extensively with Natural Resources Agent, XXXXXXXXXXXX, to plan and deliver the XXXXXXXXXXXXXXXXXXXX, XXXXXXXXXXXX, as well as programs for XXXXXXXXXXXXXXXXXXXXXXXXXXXX.

I also have worked extensively with former 4-H Agent XXXXXXXXXXXX on developing judging criteria for the annual 4-H Fair; also with XXXXXXXXXXXX to deliver summer training programs for the 4-H youth in horticulture-related topics.

I collaborated with FCS Agent, XXXXXXXXXXXX and CED/Agriculture Agent, XXXXXXXXXXXX on the Farmer Education Series in XXXX.

**Provide documentation/evidence of the marketing of your program.**

In the supplemental documentation section I have provided the following:

- An excerpt from *The XXXXXXXXXXXX Gardener*
- Fliers announcing upcoming workshops on:
  - Pruning
  - Shiitake Mushroom production
- Letter mailed to private pesticide applicators announcing re-certification classes
- A year-end report sent to the county commissioners about the accomplishments of the XXXX Master Gardener Volunteers
- A newspaper article discussing the "XXXXXXXXXXXXXXXXX Program"
- A news article written for the *Star News* in XXXX
- A powerpoint presentation from:
  - Advisory council meeting
- A research article published in *HortTechnology* in XXXX: "A review of organic lawn care practices and policies in North America and the implications of lawn plant diversity and insect pest management."
- Excerpt from "*Agent's Guide for Planning and Implementing Horticulture Programs.*"

### III. Leadership Career and Professional Development

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- In-service Horticulture Agent training; focused on program planning and work-life balance;
- Engaging Latino Community in Extension programming; training related to the involvement and recruitment of Hispanic/Latino audiences for extension programming;
- New and Emerging Crops; training on new crops entering production systems;
- Ornamental Production; logistics of managing nurseries and disease, insect, and weed management;
- Vegetable Crop Production in Field Systems; various vegetable crops and their management in field production systems;
- Commercial Fruit Production; small fruits production and pest management;
- Community Garden 2 day workshop; planning, organizing, and implementing community gardens in your county;
- Amer. Soc. Hort. Sci. Annual Meeting;
- Southern Sustainable Agriculture Working Group (SSAWG) Conference:
  - Managing vegetable disease in high tunnel production systems;
  - Specialty crops for farmers markets;
  - Enhancing community engagement for community gardens.

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- Aquatic Training: Weeds and Fish; aquatic weed identification for ponds and lakes in Eastern NC;
- Consumer and Urban Horticulture Workshop; working meeting focused on Extension Gardener Newsletter and Social Media;
- Plants, Pests, and Pathogens; updates on plant pests for the summer;
- Private Applicator Re-certification XXXX-2017; new updates for the private applicator recertification training course;

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- Tomato Grafting Field Day; workshop at CEFS on grafting tomatoes and in-field variety trial results;
- Annual In-service training for Horticulture Agents who manage EMGV Programs; idea share and collaborative working meeting for agents who have EMGV responsibilities;
- Program Planning, Design, and Implementation; programming for 21<sup>st</sup> century;
- In-service training for Horticulture Agents: cooperative work group for program planning and the direction of the state Consumer Horticulture Program;
- Successfully growing fruit for local markets; tree and small fruits production and pest management;
- Understanding the Extension Title Promotion system; navigating the title promotion system and preparing title promotion packets.

#### **How have you shared opportunities and information gained?**

I have been able to implement all of the trainings into either the development of my Horticulture Program or for professional improvement, or both. I have held workshops and trainings for farmers, landscapers,

pesticide applicators, Master Gardeners, and homeowners that directly convey the information I learned at agent trainings or workshops. Further, I have been able to incorporate the *Program planning* workshops into my own program that has helped me create focused, well-planned, and executable lesson plans for each and every class that I offer in my Horticulture Program.

I have created the XXXXXXXXXXXXXXXXXXXX, a document that includes the goals and objectives, as well as lesson plans and learning models for all areas of responsibility for my horticulture program. This document can be used by all agents, but is especially useful for new agents who may not receive formal training in this area of their job. That document is included in the supplemental documents page for this packet.

**Provide evidence of team efforts and value of teamwork.**

I have worked extensively with other agents, both within my county, as well as in other counties to plan and deliver programs that reach a wide target audience. Some of these programs include:

- Master Gardener Initial Training;
- Master Gardener Advanced Training;
- Pesticide Recertification courses for private and commercial pesticide applicators;
- Backyard Naturalist Program;
- Farmer Education Series;
- The Extension Gardener Newsletter.

**List associations/affiliations that enhance your professional development. What roles did you play and/or positions did you hold?**

- Amer. Soc. for Hort. Sci., member since XXXX; I have been a paid subscriber and member of the American Society for Horticulture Science since XXXX. I use this publication to gather more information pertaining to new research being generated on a global scale. I use this as a way to enhance my knowledge so that I can relay pertinent information to my client base. In XXXX, I was primary author on a publication entitled: *A review of organic lawn care practices and policies in North America and the implications of lawn plant diversity and insect pest management*. This review article highlighted the various organic lawn management practices that were currently being implemented throughout North America. It focused primarily on research that documented effects of arthropods in various lawn management programs. The article concluded that there is currently no clear consensus for 'organic' lawn management and that their likely would not be any formal definition any time soon. For arthropods, the apparent increase in cost of pest management resultant from organic lawn care practices remains unclear. Currently, no studies have evaluated the effects of lawn plant diversity on arthropod diversity, and more specifically, on insect pest management;
- NCACAA; member since XXXX; I have been an active part of the NC Assoc. of County Ag Agents since XXXX. During that time, I have served on the Landscape and Turfgrass and Education and Technology subcommittees, helping organize educational events for agents in the southeast district. This has allowed a tremendous opportunity for me to regularly meet with agents from my district and share ideas on how we can better collaborate on future programs. I have been involved

for the past XXX years with the Certified Crop Advisor (CCA) trainings and helped to organize workshops and the two-day training event throughout the southeast region;

- Extension Gardener Newsletter, XXXXXXXXXX; since XXXX. I have been an active part of the Extension Gardener Newsletter team. We regularly meet as a group to discuss upcoming newsletter topics and release dates. I am in charge of collecting articles written by other agents in the coastal plain/sandhills and editing articles for content and word count prior to submitting to the statewide editor.

**What committees and/or opportunities in the county have you been involved in?**

Since XXXX, I have served on the advisory committee for the Horticulture Program at XXXXXXXXXXXX Community College XXXXXXXXXXXX. I have helped guide the direction of the program per the request of the horticulture staff. I have served on XXXXXXXXXXXXXXXXXXXX Community Garden and XXXXXXXXXXXX Garden subcommittees. I advised and guided the planning and implementation of these gardens in the XXXXXXXXXXXXXXXXXXXX. As of XXXX, I have been an active member of the XXXXXXXXXXXX, an education and outreach organization that promotes environmental awareness of the biodiversity of the southeast region. Most recently, I was added to the XXXXXXXXXXXXXXXXXXXX organization, which helps plan meetings, schedule speakers, and focus on relevant needs of the participants who attend the workshops.

**What is your community leadership involvement?**

I currently spend my time working as a volunteer with a local farm in XXXXXXXXXXXXXXXXXXXXXXXXXXXX. I am an active member in the XXXXXXXXXXXXXXXXXXXXXXXXXXXX.

**List honors, awards, and recognition received.**

- XXXX Search for Excellence award for Precision Agriculture; regional and national award;
- XXXX nomination by the XXXXXXXXXXXXXXXXXXXX district of NCACAA for XXXXX Award;
- XXXX Grange search for excellence award in agriculture and natural resources.

**List self-directed learning activities focused on career and professional development.**

*Books read and utilized for consultations, program planning, and delivery.*

- Managing Alternative Pollinators, SARE Publication;
- Managing Cover Crops Profitably; SARE Publication;
- Specialty cut flowers: the production of annuals, perennials, bulbs, and woody plants for fresh and dried cut flower, 2<sup>nd</sup> ed.

*Floriculture*

- Business plan for cut flower production; research costs based on local interests and economic opportunity.