

OUR MISSION

NC State Extension improves the lives, economies and communities of North Carolinians through programs and partnerships focused on agriculture, food and nutrition, and 4-H youth development.

We don't just conduct groundbreaking research;
NC State Extension delivers the outcomes directly into
the hands of North Carolinians through better agricultural
products and processes, educating and developing
future industry leaders, and helping families and
individuals adopt healthier lifestyles.

Message from the Director

At NC State University, we **Think and Do.** Together with our partners, we're transforming society's grand challenges into opportunities and solutions that grow North Carolina.

I'm proud of our efforts to grow the state over the past year, as Extension continued to provide local solutions and empower people to make better-informed decisions in communities across the state.

Among our impacts in 2017, we...

- > Increased our annual economic impact in North Carolina to nearly \$300 million;
- Provided face-to-face services to 1.9 million North Carolinians through 13,000+ educational programs statewide;
- > Improved the health and well-being of ~115,000 N.C. citizens through food and nutrition programs; and
- > Prepared more than 263,000 youth the leaders of tomorrow to be responsible, engaged citizens through our 4-H efforts.

Integral to our ongoing success and the growth of our N.C. communities and economies, as always, was our collaboration with USDA's National Institute of Food and Agriculture, N.C. A&T State University and local governments across the state.

This strategic partnership, known as N.C. Cooperative Extension, creates a support system of expertise to provide solutions and fuel economic development – from breeding more profitable crops to creating local food markets, from shaping socially-responsible youth to supporting healthier communities.

It is my sincere hope that you'll take time to review the impacts of our work in this report, which is also available online at **go.ncsu.edu/ExtensionImpacts**.

We explore, we discover, we empower – and we do it with purpose. We also can't do it alone. Your support of NC State Extension and our efforts in your community is greatly appreciated. My door is always open to connect and share feedback; I look forward to working with you to grow North Carolina even more in the coming year.

Sincerely,

A. Richard Bonanno

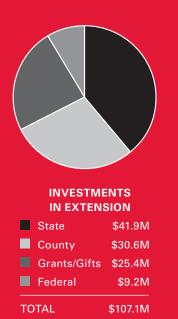
Director, NC State Extension

Associate Dean, College of Agriculture and Life Sciences



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Promoting Progress through Partnerships



NC State is a land-grant university, which involves a unique and vital obligation to serve the people of North Carolina not only through research and academics, but also Extension. It's what sets us apart from most universities.

NC State Extension works in cooperation with the U.S. Department of Agriculture's National Institute of Food and Agriculture (USDA-NIFA), N.C. A&T State University, and state and local governments. This strategic partnership, called **N.C. Cooperative Extension**, forms a vast network that aligns our resources, addresses local needs, improves access and provides solutions.

Together we enrich the lives, land and economy of North Carolinians.



National Focus on Local Issues

The USDA's National Institute of Food and Agriculture is a cornerstone of Extension. Their financial and programmatic support help strengthen Extension efforts to identify emerging research questions and to apply science and technology to improve the nation's agricultural, economic and social well-being.

Land-Grants Lead the Way

Since the passage of the Morrill Acts of 1862 and 1890, land-grant universities have worked toward a common mission to teach, conduct research and extend knowledge to the public. North Carolina has two land-grant universities – NC State and N.C. A&T – that ensure research discoveries are delivered from the campus to the community.

Serving All N.C. Citizens

Extension has offices in every county of North Carolina and the Eastern Band of Cherokee. The staff and volunteers work with local government to support agriculture, horticulture, conservation and environmental protection, nutrition and health, as well as a wide variety of consumer, youth and economic concerns.

A System of Solutions

Identify Issues

N.C. aquaculture farmer Scott Deal contacted Extension agent Mike Frinsko for information on how to get maximum yields from his new hybrid striped bass hatchery in Jones County. Frinsko thought of Dr. Benjamin Reading, assistant professor with NC State's College of Agriculture and Life Sciences, who researches the genetics and spawning process of the striped bass males that are used to breed hybrids, producing healthy genetic stock available to farmers.

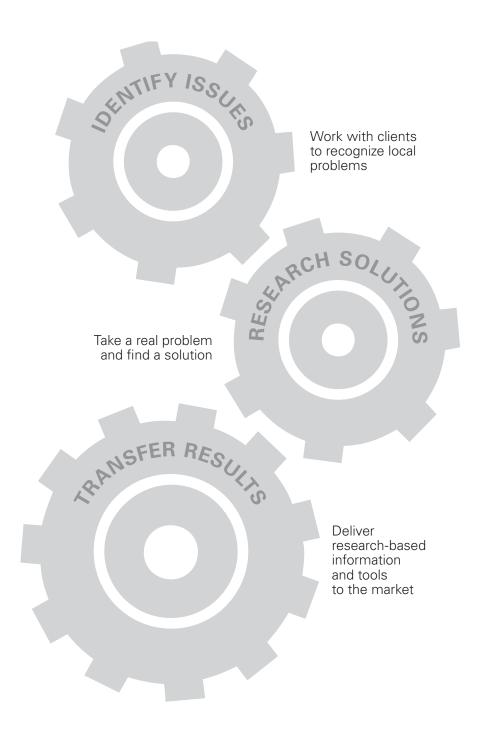
Research Solutions

In 2015, Reading's lab was able for the first time to spawn mass numbers of striped bass without the hormone induction procedures that had been standard for decades. His genetic research also produced higher-quality domestic broodstock that outperform wild broodstock of hybrid striped bass, a major boon for farmers like Deal.

Transfer Results

Frinsko connected Deal and Reading, then helped Deal implement CALS research by providing technical training and assistance through the spawning process. Deal's fishery was able to hatch about 10 million fry – roughly 6 million more than average – helping Deal get his product to market faster and become a competitive producer in just his second year of operation.

It's a global challenge – how to connect cutting-edge research with the farmers and business owners who need it. NC State Extension is CALS' bridge to farmers like Deal. We find the most up-to-date solutions for real-world problems, then provide the technical training to help farmers put that research to use effectively. This ensures that CALS' research results make a quick leap into practical application.



Extension is Everywhere for North Carolina

101 Local Centers, 812 Professionals

NC State Extension offers locally-focused services in every North Carolina county and the Eastern Band of Cherokee. County centers are staffed by 594 NC State professionals, with an additional 218 Extension faculty working on NC State's campus. Roughly 60% of the College of Agriculture and Life Sciences' research faculty have Extension appointments.







\$299.2M

Extension's annual economic impact on North Carolina – plus \$17.1M in economic value from hours worked by volunteers

^{*}Directly engaged with in the learning process individually or as part of a group.

Extension and Research Drive Rural North Carolina's Economy

With subject-matter experts housed in 101 local centers across the state, NC State Extension provides an outlet for all North Carolinians to access the wealth of knowledge at NC State and our College of Agriculture and Life Sciences (CALS). Together with our CALS research colleagues, we develop and deliver opportunities and solutions that impact every N.C. citizen through job creation, building a more sustainable agriculture economy, and preparing youth to become confident, responsible leaders and stewards of the future.

Extension's statewide network of centers and our diverse partnerships uniquely position us to make direct, positive impacts in North Carolina's rural communities, where the majority of our food and agricultural products are produced. In 2017, we managed these successes:

- > Extension provided educational services to nearly 5M North Carolinians from Tier 1 and 2 counties (Our state's most economically-challenged and often rural regions)
- > Nearly half of those contacts in Tier 1 and 2 counties were related to agriculture programming
- > 32,000 producers in rural communities adopted Extension best management practices, adding \$115.3M in net income (Practices ranging from business management and marketing to pest control and production)

Agriculture built North Carolina, and it remains our state's top industry – \$84B annually – growing to an estimated \$100B by 2020. It is especially important to rural counties, where farm gate values from our 80 Tier 1 and 2 counties account for 83% of the state's total farm receipts. Extension and CALS discover, improve and implement solutions so rural North Carolina succeeds.



NC State Extension aligns our efforts and resources into the three core areas where we are most needed, best equipped to provide solutions, and can make the greatest impacts on the state's communities and economy.





NC State Extension connects farmers, agribusinesses and communities with vital research-based information and technology. Research at NC State targets society's grand challenges. Extension delivers that research directly into the hands of North Carolinians, helping them to translate knowledge into everyday solutions.





Food and Nutrition

Extension offers a wealth of educational programs that address public health issues, improve economic well-being, and help people make healthier, better-informed decisions. Programs range from local foods and food safety to food preservation, gardening and environmental efforts, among scores of others.







4-H is the largest youth development organization in North Carolina. Hundreds of thousands of young people learn the skills to succeed through 4-H educational programs and camps. NC State Extension and the Cooperative Extension Program at N.C. A&T State University conduct 4-H programs where young people learn by doing.

Translating Cutting-Edge Research into Practical Applications

NC State Extension helps grow North Carolina with programs and partnerships focused on agriculture, food and nutrition, and 4-H youth development. While NC State researchers work to improve agricultural outcomes in the state, Extension professionals apply that knowledge in everyday settings, from the farm to the kitchen to the classroom. Our programs and partnerships grow the economy, ensure food safety and production, protect public health, and create opportunities for youth to grow and learn.



FEEDING OUR FUTURE

NC State Extension keeps North Carolina's agriculture industry – the state's leading economic sector – growing and sustainable by connecting growers with research-based information and technology.

205 county employees

691,580 face-to-face contacts

225,219 producers adopted best management practices

\$116.5M resulting net income gains by producers

4,333 Master Gardener volunteers

\$84 billion value of N.C. agriculture industry



IMPROVING OUR HEALTH

NC State Extension helps people make healthier decisions and live better lives through programs that range from home gardening and healthy eating to local food systems and food safety.

144 county employees

319.048 face-to-face contacts

114,962 participants attended training programs

1,265 food service employees trained

67,843 Steps to Health (SNAP-Ed) educational contacts

49,030 North Carolinians increased their consumption of fresh fruits and vegetables



ENRICHING OUR YOUTH

Extension's 4-H program addresses the diverse issues and backgrounds of today's youth, harvest impacting more than 263,000 youth through efforts that build healthier, more involved citizens and future leaders.

110 county employees

478.013 face-to-face contacts

263,742 total 4-H'ers

10,807 youth attended 4-H camp

214,462 hours donated by 4-H volunteers

3,740 teachers used 4-H STEM (Science, Technology, Engineering, Math) curriculum in their classrooms

Note: An additional 135 NC State county employees are affiliated with multiple program areas (not included in figures above), as well as another 145 county Extension employees that are funded entirely by county governments and/or N.C. A&T State University.

NC State Hemp Research Gets Underway

When it comes to growing hemp in North Carolina, prospective growers have lots of questions. NC State began planting six varieties of the crop in 2017 at several research stations across the state to help address their inquiries and explore the feasibility of hemp crops in the state. The goal is to answer a wide range of basic questions – from when to plant, how to plant, which varieties do best, which pests affect the crop here, how much fertilizer to use and how to harvest and dry it.

NC State Extension, in partnership with the N.C. Department of Agriculture and Consumer Services and N.C. A&T State University, is working to build their knowledge of hemp production and marketing, while helping reduce the risk associated with entering a new venture for farmers. Read more at **go.ncsu.edu/HempResearch**





Plant Sciences Initiative to Position N.C. as New Leader

NC State and the N.C. Department of Agriculture and Consumer Services are leading an effort – partnering with commodity groups, established ag businesses and start-ups – to develop a state-of-the-art research complex at NC State that draws the brightest minds in academia, government and industry. Cross-disciplinary teams will work together, bringing innovation that increases yields, enhances sustainability and extends growing seasons.

In short, we're changing the game and making North Carolina a world leader in plant sciences. Through Extension's local centers in all 100 counties, N.C. farmers will have direct access to information and guidance on the latest developments in agricultural science and technology. Read more at **go.ncsu.edu/PSIFeature**

4-H Electric Congress Celebrates its 70th Year

Every summer, North Carolina 4-H Electric Congress draws young people from across the state for hands-on learning and fun with STEM (Science, Technology, Engineering and Math) and the fundamentals of electricity. In 2017, 175 youth and their 4-H leaders and Extension agents gathered at UNC Charlotte to celebrate the 70th anniversery.

The event recognizes youth who've demonstrated outstanding knowledge and growth in Extension's 4-H Electric Program, with participants making the trip from across the state. Together they learn about the safe use of electricity, renewable energy technologies and energy conservation through activities like building solar-powered model cars and soldering circuit boards. Read more at go.ncsu.edu/4-H EC70



Chatham County Opens New \$12M Ag Center

Extension's Chatham County staff found a new home in 2017, upgrading to a state-of-the-art facility a mile down the road thanks to a \$12 million investment by our county government partners. As a result, Extension's Chatham County Center officially began operating in the new 32,500-square-foot Chatham County Agriculture and Conference Center in March.

Chatham's commitment to Extension and the revamped center underscores the importance of agriculture to the county's culture and economy. In addition to Extension, the center houses the Chatham County offices of N.C. Soil and Water Conservation, USDA Farm Service Agency and the N.C. Forest Service, along with a 6,000-square-foot exhibit hall for hosting a variety of public events. Other counties are also reinforcing their commitment to Extension through new facilities and other investments. Read more at **go.ncsu.edu/ChathamCenterOpens**





Reshaping the Landscape: Women Impacting Agriculture

In March 2017, Extension's Lee County Center launched "Reshaping the Landscape: Women Impacting Lee County Agriculture." The goal of the project was to highlight the valuable contributions of Lee County's women to agriculture, and to gather insight on Extension's ever-evolving role in supporting area growers.

The monthly series of articles and videos profiled Lee County women in a variety of agriculture-based roles, from Tina Gross, co-owner of Gross Farms and president of the N.C. Agritourism Networking Association, to J.J. Faulk, an agricultural entrepreneur, whose J.J.'s Place store expanded to a second location. Read more at **go.ncsu.edu/WomeninAg**

Extension Master Food Volunteer Program Takes Root

Food insecurity and diet-related diseases are major issues for North Carolina. On average, 22 percent of N.C. households experienced food insecurity between 2013 and 2015, compared to the national average of 12.7 percent. The Extension Master Food Volunteer (EMFV) program is a new initiative led by Dr. Dara Bloom, Extension local food specialist, designed to support Extension Family and Consumer Sciences (FCS) agents and the communities they serve by providing tools to train volunteers in the areas of cooking, nutrition, food safety and local foods.

The program was piloted in 2016-2017 with seven agents, who have trained 31 volunteers for a total of 930 training hours, 1,149 volunteer hours and 5,140 contacts reached. The program will be rolled out statewide in 2018 with 20 Extension FCS agents. Read more at **go.ncsu.edu/EMFVProgram**





Building a Stronger Agricultural Future for Our State

Agriculture is North Carolina's largest industry, generating \$84B annually while employing 16% of the state's workforce of 4.2M. North Carolina has the third most diverse agricultural economy in the country, with more than 80 different commercial crop varieties and a large animal agriculture presence. NC State Extension and CALS discover and implement better agricultural products and practices, while providing growers and agribusinesses with the resources they need to continue producing high-quality, economically-significant crops and livestock.

We also help address a growing demand from the public to learn more about where their food comes from and how agriculture impacts their lives, all of which helps keep N.C. agriculture growing and sustainable.

Securing Long-term Sustainability

The average age of a N.C. farmer is 59, and 65 percent of the state's principal producers are 55 or older. Viewed another way, only 14 percent of N.C. farmers are under the age of 45. NC State Extension is addressing a very real need to educate and develop future ag industry leaders, ensuring the long-term viability of our state's primary economic engine.

Our Research Stations Produce More

A network of 18 statewide research stations and seven field labs allows Extension to conduct research on important crops across varying climactic zones and provide a venue for Extension to initiate the process of extending research-based information to growers. NC State research and Extension with just five crops – tobacco, sweet potatoes, cotton, blueberries and soybeans – generate a \$1.67B annual impact to North Carolina's economy.



The North Carolina Food Processing and Innovation Center is set to open at the N.C. Research Campus in Kannapolis in 2018.

Food Processing and Innovation Center Poised to Boost N.C. Economy

Years in the making, the North Carolina Food Processing and Innovation Center (N.C. FoodPIC) leapt from dream to reality with the passage of the state budget in 2017. The first-of-its-kind facility will house interdisciplinary research that aims to enhance crop values, grow local food entrepreneurs, open new markets and create manufacturing jobs for rural North Carolina, while Extension's statewide network of offices will play a critical role in educating and connecting farmers and agribusinesses with the center.

The new center, set to open in 2018, is an initiative of NC State University, the N.C. Department of Agriculture and Consumer Services, and the N.C. Research Campus. Learn more at **go.ncsu.edu/FPICFeature**.

North Carolina agriculture provides **686,000 jobs** generated by **48,000 farms** on **8.2M acres**. Our state ranks number **7 in livestock, number 17 in commercial crop** cash receipts, and **number 9 in total farm income**. Extension Forestry helps translate the state's **18.6M acres of forests** into industries that make up **over 11%** of our ag economy. NC State Extension's **205 county agriculture employees** helped grow our ag industry through **691,580 face-to-face contacts,** resulting in **225,219 producers** adopting Extension best management practices and increasing their net income by at least **\$116M** in 2017.



319,048

Face-to-face contacts via our 2017 food and nutrition programs

27,659

North Carolinians increased their

physical activity

Food and Nutrition

As our state and global populations grow, so does the need for abundant, affordable and safe food. NC State Extension works to improve the health and food choices of every North Carolinian through programs from local food systems and childhood nutrition and physical activity, to heart-healthy eating and food safety. Our food and nutrition programs tackle critical public health challenges, boost economic development and help people achieve lifelong health and food security.



Making healthy choices isn't always easy, especially in North Carolina, where roughly 32 percent of N.C. adults are obese and 1-in-4 children live in poverty. The state also ranks 34th in the country for rural healthcare, meaning many rural communities lack access to adequate resources relating to healthy foods and lifestyles. NC State Extension helps people sort fact from fad, providing research-based programs that promote a lifetime of good health.

EFNEP

The Expanded Food and Nutrition Education Program (EFNEP) is a federally-funded program conducted through Extension.

EFNEP works to improve the health of limited-resource youth and families with children through practical education on nutrition, healthy lifestyles and food safety.

- 42 counties provided EFNEP services to 3,907 families
- 21,638 families and youth participated in EFNEP
- For every \$1 invested in EFNEP, there was \$10 in savings in healthcare costs

SNAP-Ed (Steps to Health)

The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) assists limited-resource individuals and families nationwide. NC State's SNAP-Ed project is Steps to Health, which promotes positive change at the local community level.

- Extension reached approximately 34,676 individuals at 47 sites
- > 8,214 children and 1,285 adults participated in Steps to Health
- More than 175 adults participated in the Eat Smart, Move More, Take Control SNAP-Ed program
- 67,843 educational contacts were established within 63 counties

Good Agricultural Practices (GAP)

Good Agricultural Practices (GAP) audits verify fruits and vegetables are produced, packed, handled and stored per U.S. Food and Drug Administration (FDA) recommendations. Extension works with growers to understand and achieve GAP certification, which is increasingly necessary for farmers to operate in certain markets.

- 1,427 growers were trained in GAP through county center programs
- > 42 farms implemented food safety plans and another 149 growers received GAP training through workshops with the Carolina Farm Stewardship Association (CFSA)
- CFSA GAP workshops helped 18 farms get GAP certification

Food Safety

Extension assists businesses and growers with food safety regulation, compliance and risk reduction – which helps consumers understand safe food practices while supporting advancements in food system safety processes, resources and technologies.

- 31,000 students received Safe Plates education through a foods career and technical training course
- > 180 environmental health specialists assessed retail food processes
- 134 regulatory and industry members certified in Hazard Analysis and Critical Control Points (HACCP)
- 631 people received food protection manager certification through the Safe Plates program

In 2017, we had **319,048** face-to-face contacts with food and nutrition program participants. **114,962** participants attended Extension food and nutrition trainings. **1,077** participants were trained in safe home food handling, preservation, or preparation practices. **1,265** food service employees were trained. **49,030** North Carolinians increased their consumption of fresh fruits and vegetables, and **27,659** increased their physical activity.



4-H Youth Development

Extension's 4-H program, best recognized by the four-leaf clover (the H's stand for Head, Heart, Hands, Health), strives to uphold its motto: "to make the best better." We provided more than 263,000 youth with the confidence and knowledge to succeed and improve the world around them last year. Our 4-H programs and camps encourage young people to learn by doing, helping N.C. youth to reach their full potential.

4-H is a national leader in STEM education (Science, Technology, Engineering, Math)

> 155,837 gain valuable knowledge in STEM fields

We help teachers deliver quality, research-driven STEM lessons to their students

 3,740 teachers used 4-H STEM curriculum in their classrooms last year

N.C. 4-H operates three camps: Betsy-Jeff Penn, Camp Millstone and Eastern 4-H Center

- > 10,807 youth attended 4-H residential and day camps
- > 2,053 4-H clubs operate in North Carolina
- 4-H volunteers donated more than 200,000 hours of service (valued at \$5.2M)
- 45,115 youth increased their knowledge of career/ employability skills
- > 783 youth participated in the Juntos 4-H program, which helps prepare Latino youth (grades 8-12) to pursue higher education

Where Do 4-H'ers Live?

Farm	5.3%	13,907
Small Town	52.5%	138,427
Large Town	20.8%	55,041
Suburbs	8.8%	23,208
City / Metro	12.6%	33,159

Help Grow the Leaders of Tomorrow



For more than 80 years, Extension's 4-H camps have taught youth life skills through centers located from the mountains to the Sandhills to the coast. Each year, more than 10,000 youth from across the state participate in 4-H programs at our three camps:

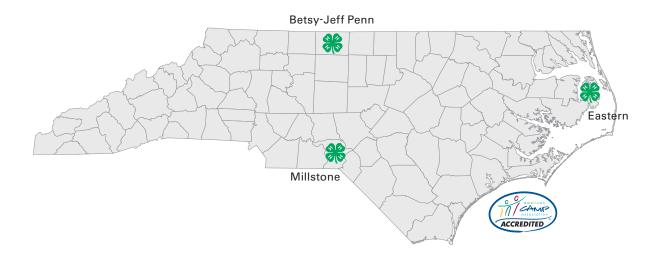
North Carolina 4-H Camps

- > Betsy-Jeff Penn 4-H Educational Center, Reidsville bjpenn4h.org
- > Eastern 4-H Center, Columbia eastern4hcenter.org
- > Millstone 4-H Camp, Ellerbe millstone4hcamp.org

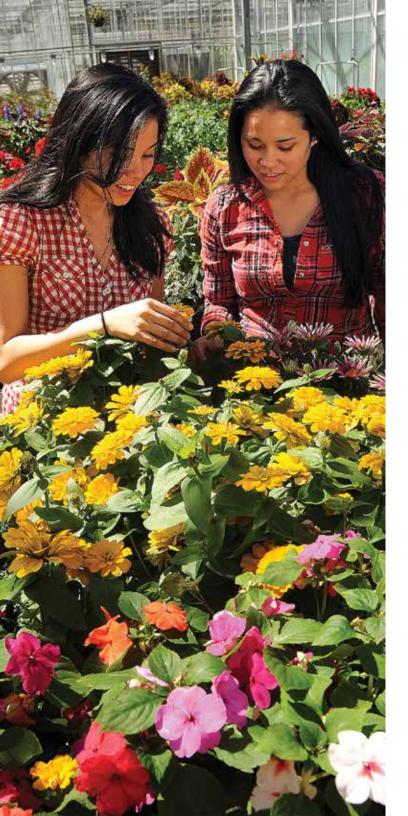
Extension's residential and day 4-H camps have a rich history of providing educational programming to thousands of youth through hands-on, experiential learning. 4-H camps provide a range of physical fitness and recreational adventures like archery, canoeing and environmental exploration, as well as character-building activities that focus on teambuilding, resource management and STEM studies.

4-H camps strengthen the foundations of the diverse communities we serve and instill valuable, lifelong lessons in our youth. We're committed to nurturing the potential of children through youth development, improving our state's well-being by promoting healthy lifestyles, and fostering a sense of social responsibility by providing opportunities to give back and support our N.C. neighbors.

Help sustain and grow these programs for future generations and ensure a healthy, fit and responsible North Carolina for years to come. Make a secure gift online: **go.ncsu.edu/ExtensionGift**







NC State Extension Master Gardener

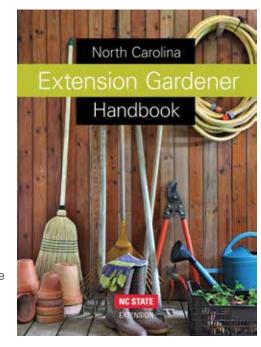
The NC State Extension Master GardenerSM program (EMG) trains thousands of talented volunteers who work with Extension agents to deliver research-based information on sustainable gardening and landscaping. Together they guide homeowners in making environmentally sound decisions in their gardens, lawns and communities.

Extension Master Gardener volunteers made a powerful impact on our state.

- > 4,300+ EMG volunteers contributed their expertise and services across North Carolina
- > EMG volunteers donated more than 211,000 hours managing demonstration gardens, directing youth programs and presenting educational talks
- > EMG volunteers provided \$5.1M in time and services last year

The North Carolina Extension Gardener Handbook

The NC State Extension Master Gardener program launched a revamped reference manual, the North Carolina Extension Gardener Handbook, which received the American Society of Horticultural Science's 2017 Outstanding Book Award. The manual guides green thumbs through garden planning, preparation and maintenance, explaining the basics from soils and composting to growing vegetables and managing wildlife. Written by the state's leading horticulture experts, the handbook was developed to support program volunteers and N.C. gardeners with the help of research-based information on gardening successfully in North Carolina and the Southeast. Access the handbook at go.ncsu.edu/EG-Handbook.



Extension Puts Knowledge to Work for North Carolina

North Carolina is growing – fast. To address the needs of an increasingly diverse and dynamic population, NC State Extension serves as a bridge between North Carolinians and the state's preeminent research university.

We provide trusted tools and resources for a wide range of topics, from healthy eating, local foods and home gardening to agricultural production, pest management and youth development.

NC State Extension offers 13,000+ educational programs, offices in all 100 counties and a network of 50+ websites that serves over 2M visitors each year. Whether it's on the farm, in the city or on the web, we grow North Carolinians.

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NC State Extension is committed to the value of diversity within our organization and to the provision of equal opportunity and non-discrimination for all employees and for all participants that engage or seek to take part in our programs. We actively prohibit discrimination and harassment regardless of age, color, disability, family and marital status, gender identity, genetic information, national origin, political beliefs, race, religion, sex (including pregnancy), sexual orientation and veteran status. Learn more at go.ncsu.edu/equality.

