



Annual Report to the Chancellor College of Agriculture and Life Sciences

During a challenging year, the College of Agriculture and Life Sciences continued to make headway in enhancing:

- > student success through educational innovation
- > scholarship and research by investing in faculty and infrastructure
- > interdisciplinary scholarship to address society's grand challenges
- > organizational excellence by creating a culture of constant improvement
- > local and global engagement through focused strategic partnerships

This report highlights progress toward achieving these goals and enhancing diversity and inclusion, private fundraising, human resources and communication. It also lists regional, national and international awards.

Enhancing student success through educational innovation

As the needs of students and agricultural and life sciences industries have changed, so has CALS. One example: Our two-year Agricultural Institute is creating new programs with funding from the Golden LEAF Foundation to prepare students for food animal industry jobs. These programs include an agricultural operations certificate to fill the need for highly trained farm managers; a food animal and poultry processing curriculum; a peer mentorship collaborative linking AGI students with high school students; and an internship support program.

The college's first fully online BSc degree is nearing final approval. By creating an online version of the current BSc degree in Agricultural and Human Sciences, CALS is serving place-bound students – particularly community college students – unable to relocate to Raleigh.

New certificate programs also moved forward. Two certificates in regulatory science in agriculture at the undergraduate and graduate levels (Crop and Soil Sciences) have begun to help fill a growing need for well-trained regulators. A new graduate data science certificate (Biological and Agricultural Engineering) addresses the significant challenges with managing huge amounts of data in agriculture and life sciences. In addition, three other certificate programs are in the works: graduate leadership in agricultural and human sciences; undergraduate agriculture (Agricultural and Human Sciences), and agricultural operations (Agricultural Institute).

Finally, the FFAR Fellows program, funded by the Foundation for Food and Agriculture Research and private industry, is in the renewal process. An innovative workforce training model for graduate education, the program is designed to prepare a new generation of agriculture and life sciences leaders in academia, industry and government. The program encourages communicating and collaborating across disciplines.

Enhancing scholarship and research by investing in faculty and infrastructure

In fiscal year 2021, CALS continued to invest in desperately needed repairs and renovations to aging facilities on campus and in offsite locations to expand and preserve research capabilities. About \$4.3 million has been used to ensure the continued viability of our campus lab spaces, greenhouses and our fish barn. The college also purchased a 41-acre parcel in Clayton adjacent to the Central Crops Research Station and a 12-acre site that is wrapped on three sides by the Lake Wheeler Road Field Lab. Otherwise, the parcel would have been used for high-density housing.

CALS invested \$6.1 million to address key personnel needs. CALS has also invested in support for Extension's area specialized agents and in career growth for county agents, while the joint Provost/CALS Strategic Hire Program has led to excellent faculty hires. To ensure the success of new faculty members, CALS used \$5.2 million to enhance start-up packages that pay for equipment and salaries for technicians and lab personnel.

CALS also designated \$2.3 million for much needed equipment and vehicles for research and extension. Meanwhile, we are modernizing our research stations and field labs to keep up with agriculture technology and engineering improvements that will enhance our faculty's ability to extend research across the state.

Enhancing interdisciplinary scholarship to address society's grand challenges

The interdisciplinary North Carolina Plant Sciences Initiative continues to grow, involving six colleges and 79 faculty members. The initiative, designed to tackle the world's most complex agricultural issues, has spurred partnerships with industry and with other universities interested in taking a multifaceted approach to solving those problems.

With the N.C. PSI in the lead, NC State has teamed up with SAS and Microsoft to address some of these challenges. Several research teams will use cloud and internet of things (IoT) services from SAS and Microsoft to put big data to work and improve the profitability of sweet potatoes and to complement the use of in-field sensors to improve the sustainability of agricultural systems. Researchers will also use big data and small sensors to detect plant diseases before they cause problems.

Thanks to the N.C. PSI and major funding from the Novo Nordisk Foundation, NC State is partnering with three Danish universities to examine the roles of microbes and their interactions with plants. The goal is to help make crops more resilient against stressors and reduce the need for chemicals and irrigation.

Overall, the interdisciplinary approach CALS scientists are taking is paying off. In 2020-21, faculty members captured over \$90 million in competitive funding and had a total of 1,131 publications. They also filed for 64 patents and were issued 32.

Enhancing organizational excellence by creating a culture of constant improvement

CALS set a strategic goal of becoming one of the top five land-grant colleges of its kind in the nation, and our culture of continued improvement has propelled us toward that goal. Several metrics are strong proof:

- > **Research:** #4 in total competitive funding

- > **Teaching:** #4 in number of graduate students

- > **Extension:** #2 in size of Extension program (on-campus and county)

- > **Fundraising:** #1 in dollars raised

Enhancing local and global engagement through focused strategic partnerships

While the COVID-pandemic created significant stress, NC State Extension professionals and partners persisted in improving lives, growing North Carolina and connecting with residents in innovative ways. Virtual field days, online 4-H activities and other educational programs helped keep people connected to Extension and each other.

Through the Count on Me NC partnership with the North Carolina Restaurant and Lodging Association, the state Department of Health and Human Services and Visit NC, Extension helped resuscitate the state's \$21 billion restaurant industry by designing and delivering training to food service staff so they could safely return to work and follow best practices amid the pandemic. Before restaurants reopened, 16,595 employees and 7,541 establishments were certified using Extension-developed training modules. An additional 14,555 businesses were either registered or in progress by the end of 2020.

To enhance students' learning and help kids create special moments during this challenging year, Extension's 4-H team offered virtual science lessons, viral videos and more. In 2020, 4-H delivered 2,750 educational activities; over 12,000 youth gained career and employability skills; and participants engaged in 4-H activities a total of 7.6 million times.

Extension also helped North Carolina's agriculture industry by training and empowering farmworkers to protect each other during the pandemic. Extension provided 45 health and safety training sessions with 937 farmworkers, 14 growers and six farm labor contractors. It also helped distribute 42 pallets of donated personal protective equipment to farmworkers and their families and, with other organizations, provided support to farmworkers through drive-through events and resource fairs. As the rollout of vaccines for COVID-19 continues, Extension is working with partners, including the state departments of Agriculture and Consumer Services and Health and Human Services, to educate farmworkers on vaccinations.

Enhancing diversity and inclusion, fundraising, human resources and communications

As with many Americans, NC State faculty, staff and students were affected by divisive events in 2020-21. In response, CALS' Office of Diversity and Inclusion developed and delivered 15 virtual workshops addressing issues related to racial strife, the presidential election and the pandemic. Topics ranged from the challenges of injustice to the rise of crime against the American Asian Pacific Islander community and the emotional response to the George Floyd murder trial verdict. These workshops were designed to enhance CALS' culture of inclusion. An emphasis on diversity and inclusion has also improved our recruitment of highly qualified women, black, Hispanic and Asian faculty members.

Our Human Resources unit carried out significant new responsibilities, including leadership in implementing all pandemic-related personnel policies, while guiding recruitment, selection, hiring, orientation, training, performance evaluation, coaching, consulting, organizational development, rewards and recognition, payroll, position reclassifications and salary adjustments, personnel contracts and separations.

CALS Advancement enjoyed a banner year in fundraising, raising \$40 million as of May 15. It has also raised a total of \$450 million in the university's capital campaign, exceeding CALS' goal 20 months ahead of schedule. Bill and Carolyn Jones, the North Carolina Cotton Producers Association, Syngenta, Severn Peanut Co. and others made significant donations that resulted in a 100 percent increase in major gifts over 2019-20. Gifts to the N.C. PSI totaled close to \$2 million. Funding for seven named spaces for the Plant Sciences Building was also secured as plans got underway for an April 2022 dedication. Meanwhile, Advancement reinvented its outreach programs with alumni, friends and donors in response to the pandemic. The unit held successful at-home Tailgate and Ag Day events, as well as engaging online sessions related to scholarships, the N.C. PSI and extension.

In the area of strategic communications, CALS invested resources to increase stakeholders' awareness of the impact of its research, teaching and academic programs in North Carolina and beyond. Communications professionals led strategic marketing and communications efforts to boost prospective students' understanding of CALS and its undergraduate and graduation programs, expand industry knowledge of the college and N.C. PSI, advance collaboration and funding opportunities, and elevate the visibility of NC State Extension.

Faculty awards

Department of Agricultural and Human Sciences

K.S.U. Jayaratne, Fellow and Distinguished Researcher Award, American Association for Agricultural Education

Joseph I. Donaldson, Regional Excellence in Advising New Advisor Certificate of Merit, NACADA

Ben Chapman, Extension Communications Internet Education Technology Award, National Extension Association of Family and Consumer Sciences

Joy Morgan, Early Career Teacher Award, U.S. Department of Agriculture

Department of Animal Science

Jeannette A. Moore, Distinguished Teacher Award, American Society of Animal Science

Matthew H. Poore, Extension Award, American Society of Animal Science

Kimberly Ange-van Heugten, Educator Award, North American Colleges and Teachers of Agriculture

Christian Malteca, J.L. Lush Award in Animal Breeding, American Dairy Science Association

Department of Applied Ecology

Erin McKenney, New Faculty Advisor Award, National Academic Advising Association

Elsa Youngsteadt, Environmental Entomology and People's Choice Award, Entomological Society of America

Department of Biological and Agricultural Engineering

Garey A. Fox, Fellow, American Society of Biological and Agricultural Engineers

Natalie Nelson, CAREER Award, National Science Foundation; Early-Career Research Fellowship, National Academies of Sciences, Engineering and Medicine

Sanjay B. Shah, Outstanding Associate Editor, American Society of Biological and Agricultural Engineers

Department of Food, Bioprocessing and Nutrition Sciences

Jonathan C. Allen, Fellow, Institute of Food Technologists

Rodolphe Barrangou, Fellow, National Academy of Inventors

Fred Breidt, Technical Achievement Award, Association of Dressings and Sauces

MaryAnn Drake, Zimpro Award for Excellence in Dairy Science, American Dairy Science Association; JDS Club 100 Award, Journal of Dairy Science

Ken R. Swartzel, Fellow, National Academy of Inventors

Department of Horticultural Science

John Dole, Benjamin Y. Morrison Lecturer, U.S. Department of Agriculture Agricultural Research Service

Katie M. Jennings, Outstanding Teacher Award, Weed Science Society of America

Christopher Gunter, Fellow, America Society for Horticultural Science

Brian Eugene Jackson, Outstanding International Horticulturalist Award, American Society for Horticultural Science

Penelope Perkins-Veazie, Benjamin Y. Morrison Lecturer, U.S. Department of Agriculture Agricultural Research Service

Thomas G. Ranney, Fellow, National Academy of Inventors

Todd C. Wehner, William R. Moore Hall of Fame Award, Pickle Packers International

Department of Plant and Microbial Biology

Qiuyun “Jenny” Xiang, Distinguished Fellow, Botanical Society of America

Candace H. Haigler, Women in Agriculture Biotechnology and Genetics Award, Cotton Inc.

Heike Sederoff, Outstanding Research Award, Association for Career and Technical Education Research

Prestage Department of Poultry Science

Kenneth E. Anderson, Evonik Degussa Award for Achievement in Poultry Science, Poultry Science Association

Lynn Worley-Davis, Teaching Award of Merit, North American Colleges and Teachers of Agriculture

NC State Extension/Cooperative Extension

Jessica A. Anderson (Wilson County), Achievement Award, National Association of County Agricultural Agents

Becky Lynn Bowen, Southern Regional Award (Educational Materials, Team), National Association of Community Development Extension Professionals

Eddy L. Labus (Watauga County), Joint Council of Extension Professionals, Creative Excellence Award, National Association of County Agricultural Agents

Bailey McGill (Surry County), National Search for Excellence (4-H and Youth Programming), National Association of County Agricultural Agents

Joanna E. Radford (Surry County), National Search for Excellence (4-H and Youth Programming), National Association of County Agricultural Agents

Kenneth L. Sherin (Randolph County), Southern Region Distinguished Achievement Award, Epsilon Sigma Phi