



**NC STATE  
UNIVERSITY**

**Strategic Accomplishments**  
**2019-20 Report to the Chancellor**  
**College of Agriculture and Life Sciences**

## 2019-20 Annual Report to the Chancellor College of Agriculture and Life Sciences

2019-20 was a year of change, challenge and accomplishment for the College of Agriculture and Life Sciences. This report highlights the college's success in meeting the university's strategic goals related to student success, scholarship and research, organizational excellence and local and global engagement.

### 1. Enhance the success of our students through educational innovation

Through several new and enhanced programs, CALS made significant headway in 2019-20 in helping its students achieve their highest potential:

- The Agricultural Institute created the **AGI Internship Program**, including a pre-internship course, to help students meet a new requirement that they successfully complete an internship. Thanks to supportive employers, over 100 students are participating each summer, and employers have commented favorably on their preparation.
- Through the Center of Excellence for Regulatory Science in Agriculture, the Crop and Soil Sciences Department led the creation of a new undergraduate **Certificate in Regulatory Science in Agriculture** "to address the critical training needs for future leaders, scientists, policy makers, and others." Students will learn the science, techniques and policies underpinning agriculture regulation as well as risk management, compliance, data assessment, and regulatory communications.
- Hundreds of students participated in career preparation activities through **CALS Career Services**. Activities included 453 counseling appointments, 47 workshops and classes, 6 mock interview nights, the Ag & Life Sciences Career Expo, the CALS Career Coaches program, a new speed networking event and a life sciences networking event.
- To increase student **professional development** participation, CALS created a new course, ALS 602 *Preparing for a Career in Agriculture and the Life Sciences*. It joins ongoing professional development efforts for graduate students, including the FFAR Fellows program and the multi-

college graduate peer mentoring program. CALS also offers undergraduate and AGI students opportunities through the Thomas Jefferson Scholars, CALS Honors, study abroad and CALS and AGI Ambassadors programs, plus a multitude of CALS clubs and organizations. CALS also supported clubs and organizations through the Gordon Student Leaders Workshop.

## **2. Enhance scholarship and research by investing in faculty and infrastructure**

During 2019-20, SAS, a world-leading analytics company with headquarters in Cary, strengthened its partnership with CALS. A gift from Jim Goodnight, SAS' founder and an NC State alumnus, led to the establishment of the **Statistical Analytical Systems Data Sharing and Data Analytics Partnership and Endowed Professorship**. The professorship in agricultural data analytics — the college's first endowed chair — is expected to be filled in 2020-21 or soon thereafter.

CALS also made progress on several infrastructure improvement projects:

- In partnership with the College of Engineering as part of their 5G research initiative, CALS invested in **fiber broadband infrastructure at the Lake Wheeler Road Field Laboratory**. The college also continued working toward the goal of providing state-of-the-art agricultural research infrastructure through **research station modernization** and development of **Future-Ready Farms**.
- The college purchased land adjacent to **the Central Crops Research Station** in Clayton to ensure this important station's continued viability and to prevent the loss of land to urban development.
- Construction continued on the **Plant Sciences Building**, with occupancy expected in late 2021 or early 2022. CALS has also continued working with other colleges to identify the building's initial faculty occupants.
- Planning is underway for a federally funded **U.S. Department of Agriculture building** to be constructed at the Lake Wheeler Road Field Laboratory. Federal scientists will vacate university spaces to occupy this building, most likely in 2023-24.

- CALS coordinated 16 on-campus **facilities repair and renovation projects** (\$1.2 million) affecting all 12 departments.
- The third floor of **Ricks Hall** is being renovated to accommodate personnel relocated from Brickhaven buildings demolished because of the widening of I-440.

### 3. **Enhance interdisciplinary scholarship to address the grand challenges of society**

Interdisciplinary scholarship continued to be an emphasis for CALS:

- Four NC State research teams including CALS faculty members were selected as seed grant winners in the **Game-Changing Research Incentive Program for the Plant Sciences Initiative**, or GRIP4PSI:
  - FUN-CROPS: Foliar fungal endophytes for enhanced crop sustainability and resilience
  - Plant-Aid: A Data-Driven and Sensor-Integrated Platform for Monitoring Emerging Plant Diseases
  - Harnessing (Bio-) Electrochemical Technologies as Sustainable Sources for On-Demand Precision Agriculture
  - Improving Crop Productivity and Value Through Heterogeneous Data Integration, Analytics, and Decision Support Platforms
- NC State's **Plant Breeding Consortium** welcomed an internationally recognized plant breeding program leader, Carlos Iglesias, as its director. The consortium includes over 35 faculty members and their students in the colleges of Agriculture and Life Sciences and Natural Resources.
- Work continued on the new \$32 million Collaborative Crop Resilience Program, funded in 2019 by the Novo Nordisk Foundation, to discover ways to help farmers raise yields with less reliance on chemical treatments and irrigation. Researchers at NC State and three Danish institutions are working together to find ways to harness microbes that live on, in or near plants to protect crops from various stressors.

#### **4. Enhance organizational excellence by creating a culture of constant improvement**

CALS aspires to be among the top five land-grant colleges of its kind in the nation, and recent metrics mark progress toward meeting that goal:

- **Research #3** in Competitive Research Dollars/Faculty FTE
- **Research #5** in Total Competitive Dollars
- **Teaching #1** 2-year Associate Degree Program (AGI)
- **Teaching #4** Number of Graduate Students/Faculty FTE
- **Extension #2** Size of Cooperative Extension Program (on-campus/county)
- **Fundraising #1** Dollars Raised

#### **5. Enhance local and global engagement through focused partnerships**

CALS continues to benefit from research agreements forged with three international life sciences companies, **BASF**, **Novozymes**, and **Premex**, between 2017 and 2019. A fourth agreement, with **DSM Nutritional Products**, a global science-based company focuses on nutrition, health and sustainable living, was signed in 2020. The memorandum of understanding and a related \$10 million agreement mark a deepening DSM's partnership with NC State University and its colleges of Agriculture and Life Sciences and Veterinary Medicine.

Meanwhile, Extension continues to be a powerful partner for North Carolina, as evidenced by the following accomplishments:

- The Extension **COVID-19 Resources and Information website** serves as a one-stop-shop to highlight timely resources to help farmers, agribusinesses, individuals, families and community leaders address challenges. Within the first two months, Extension generated 70+ news updates and roughly a dozen new pages. The site garnered nearly 75,000 pageviews (more than 3/4 of site users are in N.C. or the Southeast).
- The closing of schools due to COVID-19 has left many economically disadvantaged parents concerned about how to feed their families. Extension **helped deliver more than 1 million**

**meals** — over 20,000 meals each weekday — by staffing 32 curbside meal delivery sites and helping deliver meals to nearly 70 community drop-off sites.

- School closures also put a damper on many class projects across the state, but Extension responded by **adopting new tools and technology to provide virtual programming and deliver timely expertise**. In Johnston County, for example, the 4-H team went in a new direction, using Facebook Live to teach their embryology curriculum, answer questions and virtually show students the incubation and hatching process for chicks. The event was publicized by local teachers to their students and has reached more than 90,000 individuals and was shared on social media over 500 times.
- NC State Extension, in partnership with N.C. Department of Health and Human Services, N.C. Restaurant and Lodging Association and Visit NC, launched the “**Count On Me NC**” program. Count On Me NC is focused on providing essential knowledge and information needed to manage COVID-19 within food-service businesses. To date, the program has certified nearly 40,000 individuals and around 10,000 food businesses in North Carolina.

#### **A. Changes in Service Environment**

Changes came on many fronts in 2019-20. The **COVID-19** pandemic that began in March paused and refocused all activities. New federal regulations affecting **international student access** emerged. And **low prices for major agricultural commodities** caused commodity groups to reduce their monetary support.

Other persistent challenges included the need to spend significant funds on space renovation and maintenance, the difficulty in “sunsetting” activities to allow investment in new areas, the shortage of quality lab and field research facilities, and the impact of spousal hiring accommodations and retention offers on our ability to attract, hire, and retain excellent faculty members.

## **B. Initiatives: Major initiatives and/or changes to programs or activities**

Three CALS initiatives marked major progress in 2019-20:

- In Kannapolis, about 250 people came out for the **grand opening of the NC Food Innovation Lab** on the North Carolina Research Campus. The lab, six years in the making, is an important piece of North Carolina's **food processing and manufacturing initiative**. Its goal: to grow food processing in North Carolina by providing the innovation and education the industry needs for success.
- In September, Hurricane Dorian forced over 400 people indoors as they celebrated the **start of construction for NC State's Plant Sciences Building**, part of the **North Carolina Plant Sciences Initiative**. On hand were elected officials, representations of state and federal governments, private donors, agricultural leaders and university faculty, staff and students.
- In September, the **Food Animal Initiative** – a partnership of NC State's colleges of Veterinary Medicine and Agriculture and Life Sciences – hosted the first International Symposium on Precision Systems and Data Analysis in Animal Agriculture. The two-day event brought together data scientists and animal scientists (and those pioneering their intersections) and showcased the ideas and technology that will help food animal producers solve the challenges presented by a growing world population.

## **C. Diversity: Initiatives and progress**

CALS continued its efforts to create and nurture an environment of inclusivity and diversity, providing programming for faculty, staff and student conversations that acknowledges diversity as a reflection both differences and similarities. In 2019-20, the Office of Diversity and Inclusion (ODI) hosted a learn-at-lunch series called **Conversations that Matter** on bringing visibility to "invisible" groups of people whose identities might not be readily apparent.

ODI also held a **Women's Equality Day Luncheon**, launched a **Diversity Ambassador** program and developed a **First-Generation Connect** program to help students whose parents or guardians didn't earn college degrees develop leadership skills while pursuing academic excellence.

As local and national concerns about racial injustice grew in the spring and summer, ODI held virtual **CALS Community Conversations on racism**. An initial town hall, with more than 500 participants, was so well received that plans are underway to continue them in 2020-21.

Meanwhile, the college continued efforts to increase the diversity of its faculty, staff and student body. Of 97 **faculty hires** in 2019-20, 39 were female. Fifty-nine were white; 8, Hispanic/Latinx; 11, Asian; and 2, Black. One identified as having a multiracial background, while 16 did not disclose.

#### **D. Instructional Program Advances**

Launched in fall 2019, the **CALS Online Academy** will reduce equivalency issues from transferring community college courses in agriculture, food and life science to majors, provide high-quality training resources for North Carolina Cooperative Extension agents and Master Gardener Volunteers, and provide high-quality NC State content to students all over the world, especially in Central America, northern South America, Africa, and parts of Asia.

#### **E. Research: Volume of activity and achievements of significance**

In 2019-20, CALS researchers completed 89 intellectual property disclosures, filed 55 patents and were awarded 22 patents. They also published 1,190 peer-reviewed research papers and received grants totaling more than \$100 million. Competitive grants awarded per research scientist FTE (full-time equivalency) was \$587,281.

Research personnel included 299 research scientists (171 FTE); 251 graduate assistants (112 FTE); 91 postdocs (86 FTE); 183 technicians and support staff (173 FTE); and 153 researchers (141 FTE research assistants, associates and researchers). Their research took place across 12 CALS

departments and included collaborations with North Carolina A&T State University and with NC State University's colleges of Natural Resources; Sciences; Education; Humanities and Social Sciences; and Veterinary Medicine.

Faculty conducted over 1,200 research projects at 18 research stations across the state; at research and extension centers at Plymouth and Mills River; and at 10 NC State field labs. These sites also hosted over 19,000 attendees at field days and other events. Faculty also contributed to the work of 10 NC State centers.

CALS research is also vital to the partnerships and progress of the North Carolina Research Campus in Kannapolis, which houses researchers from UNC-CH, UNCG, UNCC, NCCU, ASU, NCCU, Duke University and Rowan-Cabarrus Community College.

Other partnerships involved over 80 active commodity organizations; state and federal agriculture and life sciences agencies; agricultural advocacy organizations such as the N.C. Farm Bureau, the N.C. State Grange, the N.C. Biotechnology Center; and various companies.

**Research Expenditures (5/1/19-4/30/20)**

	<b>Total</b>	<b>Personnel</b>	<b>Operating</b>
<b>Federal</b>	9,583,766	9,007,153	576,613
<b>State</b>	69,616,164	42,759,846	26,856,318
<b>Sponsored Research</b>	53,824,732	26,527,340	27,297,392
<b>Overhead</b>	1,893,126	171,270	1,721,856
<b>Sales and Service</b>	2,696,704	1,111,804	1,584,900
<b>Foundations</b>	4,683,450	2,478,932	2,204,518
<b>Gifts</b>	1,266,452	511,008	755,444
<b>Totals</b>	<b>143,564,393</b>	<b>82,567,353</b>	<b>60,997,040</b>
	<b>% of Total</b>	<b>65%</b>	<b>35%</b>

*\*Percentages for personnel and operating costs include only federal and state funds.*

## **F. Extension: Initiatives and public service activities**

A partnership of NC State University, NC A&T State University, as well as county governments, NC State Extension is the largest non-formal educational outreach organization in the UNC system. It offers locally-focused services to people in every North Carolina county and to the Eastern Band of Cherokee Indians.

More than 1,000 NC State employees – including 619 in counties and 439 on campus – were involved in extension work in 2019-20. Highlights for 2019-20 included a \$2.1 billion annual economic impact on the state; a 27:1 economic return on government investments; face-to-face connections to 1.5 million North Carolinians; and 13,000 programs delivered in communities statewide.

Extension programs, organized in three areas, had significant impact across the state:

- **Agriculture: Feeding Our Future.** NC State Extension helped keep North Carolina's agriculture industry – the state's leading economic sector, worth \$92.7 billion annually – growing and sustainable by making 542,507 face-to-face contacts; reaching 124,521 program participants; and helping growers adopt 96,792 best management practices.
- **Food and Nutrition: Improving Our Health.** NC State Extension's food and nutrition programs tackled critical public health challenges, boosted economic development and helped people achieve lifelong health and food security by making 219,860 face-to-face contacts; involving 71,973 program participants; training 4,646 food-service employees trained; and helping 46,554 people increase their consumption of fresh produce.
- **4-H Youth Development | Enriching Our Youth.** Extension's 4-H program upheld its motto "to make the best better" by involving 261,210 total 4-H'ers; making 591,854 face-to-face contacts; providing camping experiences for 8,400 youth; and involving 16,789 volunteers.

## **G. Faculty: Honors, awards and recognition**

Dr. Kimberly Allen, Agricultural and Human Sciences, University Faculty Scholar

Dr. Jeffrey Buckel, Applied Ecology, 2020 Alumni Association Outstanding Research Award

(Induction to Research Leadership Academy)

Dr. Ange-van Heugten, Animal Science, Outstanding Teaching Award

Dr. Katie Jennings, Horticultural Science, University Faculty Scholar

Dr. Peter Ojiambo, Entomology and Plant Pathology, University Faculty Scholar

Dr. Benjamin Reading, Applied Ecology, University Faculty Scholar

Dr. Gary Roberson, Biological and Agricultural Engineering, Alumni Distinguished Undergraduate Professor Award

Dr. John Russ, Agricultural and Resource Economics, Alumni Distinguished Undergraduate Professor Award

Dr. Ross Sozzani, Plant and Microbial Biology, University Faculty Scholar

Dr. Julianne Treme, Agricultural and Resource Economics, Outstanding Teaching Award

## **H. Fundraising: Private fundraising successes**

CALS Advancement raised a total of \$51.7 million in 2019-20. CALS contributions to the university's capital campaign topped \$411.6 million, exceeding the college's \$400 million goal 20 months ahead of schedule.

**Major gifts** included \$2.25 million for the Plant Sciences Building (family gift); \$2 million for an Animal Science Scholarship (individual donor); \$1.45 million for multiple programs (foundation gift); \$1.4 Million charitable remainder trust/research (individual donor); \$1 million for scholarships (individual donor); \$1 million in unrestricted planned gift (individual donor); \$1 million for the Distinguished Chair in Data Analytics (individual donor); and \$650,000 Plant Sciences Building (corporate donor).

**Top submitted proposals** were as follows: \$9 million, NovoNordisk Foundation; \$1.83 million, Cotton Distinguished Chair; \$1.3 million, Horticulture Distinguished Professor; \$1.2 million, Crop and Soil Sciences student support; \$1 million, Horticultural Science/JC Raulston Arboretum; \$1 million, Lake Wheeler Road Field Laboratory renovations; and \$1 million, Crop and Soil Sciences.

As part of the university's **Day of Giving**, CALS closed \$490,452 in major gifts. Even though the Day of Giving event was cancelled, associated gifts increased 210% from the previous year. Through **annual giving**, the North Carolina 4-H Development Fund Board raised \$190,000, and funds raised for JC Raulston Arboretum projects increased to \$126,000, which was up despite the fact that the Gala in the Garden was cancelled.

Fundraising for **Plant Sciences Building** continued. A total of \$2.5 million came from six gifts for naming spaces; that represents an increase of 50% from last year. Nineteen proposals were submitted for the building this fiscal year, and at the time of this report, CALS Advancement was managing 13 open proposals for a total of \$20 million.

## **I. Administration**

Business operations, communications and human resources units provide vital support to CALS' research, teaching and extension efforts. 2019-20 brought evidence of increased efficiency, effectiveness and accomplishment for each of these units.

In 2019-20, the **CALS' Business Office** (CBO):

- assisted with a study of the feasibility and operational impacts of relocating the **IR-4 Project headquarters** to NC State, set up financial accounting systems and supported the transfer of funds from Rutgers to NC State. (IR-4 facilitates national registration of specialty crop pesticides and biopesticides.)
- provided key leadership in implementing a collaborative **CALS faculty hiring process** that

enables better planning by department heads and expands organizational awareness of college-level resources and associated challenges and opportunities.

- with the assistant dean for human relations, engaged five department heads in **evaluating core business, HR, and student support function** in departments versus centralized operations and analyzed workload metrics by college unit to understand relative demands on departmental business service staff members.
- continued to work with stakeholders to develop a **collegewide budget allocation model** to more appropriately and accurately allocate resources to strategically important activities. This work, temporarily halted due to COVID-19, will be resumed when priorities allow.
- continued to carry out business functions while maintaining high levels of customer service amid the **COVID-19 pandemic**. Web pages were developed to provide business-specific and research-related guidance, and weekly virtual huddles have been held to discuss HR and business updates with partners.

**CALS Communications** launched several successful marketing campaigns while also providing quality creative services in 2019-20. Here are highlights:

- CALS **website page-views** topped 2.1 million, a 34% increase, while site visitors increased by 39%, to over 485,000. During 2019-20, about 270 **new stories** related to research, teaching, extension, advancement and administration were added to the site, an average of 22 per month. The year's top story celebrated the start of construction for the university's new Plant Sciences Building.
- **CALS Magazine** achieved national recognition when won the gold award in an Association for Communication Excellence (ACE) competition.
- **Social media** impressions grew by 175% to 9.2 million annually. The fan base grew by 40% to 4,100, and fan engagement with social media posts grew by 28.9%, to nearly 74,000.
- Two **marketing campaigns** focused on the **N.C. Plant Sciences Initiative**. One was a print-and-digital advertising campaign in *Science* and other targeted scientific publications and

journals and their associated digital platforms ([go.ncsu.edu/drought](http://go.ncsu.edu/drought)), and the other involved LinkedIn ads and targeted website display ads targeting key roles within the ag-tech and life sciences industries ([cals.ncsu.edu/psi/partner-with-us](http://cals.ncsu.edu/psi/partner-with-us)).

The college's **Human Resources** unit played a leadership role in helping faculty, staff and administration navigate key **COVID-19-related policy changes**. These policies related to mandatory onsite employees, paid administrative leave and the Families First Coronavirus Response Act.

Other accomplishments included:

- development and delivery of training and professional development activities for faculty, staff and administration. These activities included a new **Monday Morning Manager** series for over 350 CALS managers and weekly **HR/Business Partner Huddles** that began with the governor's COVID-19 stay-at-home order.
- special recognition during the **Chancellor's Recognizing Excellence in Diversity** event and for **Agile HR Practitioner** course completion.