NC State
EST. 1887 Raleigh, NC
Think and Do

College of Agriculture and Life Sciences
2016-17 Report to the Chancellor
In 2016-17, the College of Agriculture and Life Sciences made significant progress toward the university’s strategic goals of enhancing student success, scholarship and research, organizational excellence and local and global engagement. This report highlights these strategic improvements, summarizes major changes and achievement, and highlights recommendations and concerns for the future.

**Strategic Plan**

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

   CALS instituted several new programs and procedures to address undergraduate access and admissions challenges:

   - Through the Nominate a Student program, teachers, advisers and others were able to tell us about students they thought would be great for CALS. Most were from rural counties, and most were nominated for under-enrolled programs. Of 102 nominated students who applied to CALS, 41 were admitted for fall, 11 were admitted via Spring Connection, 19 transferred into the college, 5 were admitted to STEAM (the Student Enrollment Advising and Mentoring program), 1 was waitlisted, 4 were denied and 21 deferred in first round.

   - The college also publicized Spring Connection, which provides students with spring admission and three fall options: community college, work/internship or gap experience.

   - We implemented PackTrac to provide a well-defined path for students to easily transition from community colleges to NC State University. Because of the university’s reverse transfer policy, the community colleges’ reaction to 1+3 has been quite positive. However, we have also implemented PackTrac for those community colleges that preferred to stay with the 2+2 model.

   - We also greatly improved communications, sending three letters to each CALS applicant (over 6,000 letters total) and delivering a clear, concise message: We want you here. There are many pathways to NC State. And there are many career opportunities in agriculture and the life sciences.

   - We increased the number of freshmen admissions scholarships; 56 percent of this year’s offers were accepted — twice as many as last year.

Applications to CALS were up 10 percent from the previous year and increased for all college programs (for some under-enrolled programs, applications were double what they were last year). For Fall 2017, we have 452 incoming freshmen — an increase of 110 students compared to last year. Many of the students are taking advantage of NC
State and CALS opportunities: 18 are in the University Honors program, 33 in University Scholars, 7 in Park Scholars, 18 in the Thomas Jefferson Scholars program, and approximately 70 in CALS Honors.

In addition, 176 transfer students were admitted for Summer Session and Fall, compared to 153 last year. Of the 93 students invited to Spring Connection, 48 have enrolled (52%), with 36 students planning to attend community or other colleges and 4 planning to work during the fall semester. We have not yet heard the fall plans for 8 students. Equally important, as a result of Spring Connection and STEAM we were able to equalize opportunities for students from Tier 1, Tier 2 and Tier 3 counties. For Tier 1, 2 or 3 counties, 64%, 62% or 63% of applicants, respectively, were admitted for Fall or Spring admission or invited to participate in STEAM programs.

For graduate programs, we focused on increasing the number of CALS graduate students. First, the provost fellowship program was reorganized to speed up allocation of the fellowships to allow more proactive recruiting and to make the program more transparent and fair within the college. Second, considering that provost fellowships were limited to doctoral students, after they were allocated, we provided funding for additional CALS assistantships for MS students as well as PhD applications. The North Carolina Agricultural Research Service (NCARS) and NC State Extension provided funding, allocating $21,000 for doctoral students and $19,000 for master’s students (thesis only). Funding was provided only for the student’s first year; faculty members and departments will be funding the students until they finish. Nine MS assistantships ($171,000) and 6 PhD assistantships ($126,000) have been awarded to date. All of this is in addition to traditional graduate student funding. As of Spring 2017, the college provided $7.65 million to support 379 students with assistantships.

Following up on last year’s U.S. Department of Agriculture’s National Needs Fellowship Grant led by Gary Payne (3 PhD students), this year Bob Rose and his team were awarded a National Science Foundation Scholarship in Science, Technology, Engineering and Mathematics (S-STEM) grant (15 MS students). CALS is also leading a nationwide consortium of universities and industry invited to submit a proposal to the Foundation for Food and Agriculture Research to fund a leading-edge pilot project in graduate education and training.

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

The North Carolina Plant Sciences Initiative is among the college’s major efforts to enhance scholarship and research, with the ambitious goal of making North Carolina the global leader in plant sciences. In 2016-17, the Golden LEAF Foundation provided $45 million for the project, the largest single investment ever in CALS’ history.
Four task forces of internal and external stakeholders worked to map a vision for the initiative, and in May 2017, they gathered to share and discuss their recommendations for governance and leadership, research and technology, workforce development and public engagement, and advocacy and resource development. An architectural firm, Flad Architects, is working to design a state-of-the-art Plant Sciences Research Complex on Centennial Campus, and a search is underway for a launch director.

The North Carolina Food Manufacturing and Processing Initiative is another effort to invest in faculty and infrastructure in ways that benefit the state’s economy. The initiative — a partnership of NC State, the North Carolina Department of Commerce, the North Carolina Department of Agriculture and Consumer Services and the Lieutenant Governor’s Office — focuses on creating a favorable environment, educational support and a marketing strategy for the recruitment of new food processing/manufacturing enterprises to the state. The initiative reached a significant milestone recently, when the North Carolina General Assembly approved a $4.4 million one-time allocation and $700,000 in recurring funds for a Food Processing Innovation Center to be housed at the North Carolina Research Campus in Kannapolis.

The state legislature also approved $700,000 in recurring funds to address employee retention and recruitment challenges faced by North Carolina State Extension. Also, with support from NC State Provost Warwick, the college is moving ahead with plans to recruit for 80 new faculty positions over the next three years.

Meanwhile, CALS continues to invest strategically through internal seed funding and support for interdisciplinary training grants. This year CALS’ two main internal grant programs provided faculty over $220,000, which leveraged an additional $133,000 to advance novel interdisciplinary research. These include the Dean’s Enrichment Multi-user Equipment and Academic Innovation program (funded 11 projects, totaling $210,000) and the CALS Faculty Innovation Big Ideas grant program (funded 6 projects, totaling of $12,500).

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

Experts predict that by 2050, to meet the needs of a fast-growing world population, farmers must produce 70 percent more food and fiber than they do today. Such a jump in production will require new science-based technology and practices that lead to higher yields on less land, using less water, while safeguarding the environment. For CALS researchers and Extension specialists, this means working together in new ways across disciplines — and training students to do the same.
The Plant Sciences Initiative is designed to encourage collaboration of leading scientists in plant-related disciplines with engineers, mathematicians, computer scientists, economists and others to generate big, workable ideas that make economic sense. It’s just one way that CALS is working to face down threats to global food security.

Microbiomes, microscopic communities of organisms that influence the health and well-being of plants, animals and humans, could be key to improving food security. In October, CALS used its signature conference, Stewards of the Future, to bring together national and state experts from multiple disciplines to raise awareness and understanding about microbiomes and their importance in agriculture, health, and the environment; to foster interdisciplinary research collaborations; and to inform policymakers and the general public about emerging developments in microbiome science.

CALS also participated in a national microbiome initiative launched in May by the White House Office of Science and Technology Policy, announcing that its university-industry partnership known as the Plant Soil Microbial Community Consortium had awarded its first grants: one to study multiple disease resistance and the maize microbiome, and one to research the microbiome of rice seed and seedlings.

CALS faculty members are also leaders of two of the Chancellor’s Faculty Excellence Program clusters designed to enhance interdisciplinary scholarship. Jean Ristaino heads the Emerging Plant Disease and Global Food Security cluster, and Michael Hyman heads the Microbiomes and Complex Microbial Communities cluster. Together with faculty members who joined CALS from the Genetic Engineering and Society, Sustainable Energy Systems and Policy, Global Environmental Change and Human Well-Being, and Synthetic and Systems Biology clusters, these new hires fill important research areas for CALS and are helping build stronger networks among colleges.

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

On July 1, 2016, the college implemented a new organizational structure aligning departments, centers and programs around four interdisciplinary systems: animal and ecological systems; food, biochemical and engineered systems; plant, insect, microbe and soil systems; and human and resource systems. This structure provides a more holistic, strategic approach to the decision-making process. The restructuring also merged the departments of Entomology and Plant Pathology; Crop Science and Soil Science (now known as Crop and Soil Sciences); and Youth, Family and Consumer Sciences and Agricultural and Extension Education (now Agricultural and Human Sciences).
The college also saw progress in business operations and communications. The business office is now a more strategic unit with a strong emphasis on excellence in customer service, and the communications unit made headway in raising the college’s brand visibility and value to its stakeholders. The staff redesigned the college’s magazine, led a major collegewide web redesign project and partnered with academic programs to address the issue of student access.

5. **Enhance local and global engagement through strategic partnerships**

Through local and global partnerships, the college helps create prosperity in North Carolina and beyond. At the local level, the most significant of these partnerships is North Carolina Cooperative Extension: With NC A&T State University, county governments and the U.S. Department of Agriculture, NC State delivers research-based knowledge and technology for all 100 counties and the Eastern Band of Cherokee. In the past year, through more than 14,000 educational programs focused on agriculture, food and nutrition, and 4-H youth development, NC State Extension connected with 1.8 million people across the state.

While Extension is one of CALS’ longstanding partnerships, newer partnerships are forming as a result of the North Carolina Plant Science Initiative. For example, in April, Vice Chancellor Marc Hoit, Dean Rich Linton, Associate Dean Steve Lommel and leadership at Oracle hosted a “big data” workshop to develop a framework for incorporating big data and technology in the initiative. Then in May, CALS representatives traveled to Flanders, Belgium, to share their research and gain insight from their counterparts with VIB, a major European life sciences research entity. The goal for the workshop was to begin creating opportunities for collaboration that lead to sustainable, affordable approaches to food and fiber production.

NCARS, the college’s research arm, has other vibrant partnerships at the local, national and international level. These partnerships are with commodity organizations; state and federal agriculture and life sciences agencies; agricultural advocacy organizations such as N.C. Farm Bureau, N.C. State Grange and the N.C. Biotechnology Center; and a variety of agricultural and life sciences companies. On a global level, CALS has international partnerships with BecA (Biosciences Eastern and Central Africa), International Rice Research Institute, the International Potato Center, the International Institute of Tropical Agriculture and the International Center for Research in Semi-Arid Tropics, among others. The college also has strategic university partnerships based on large interdisciplinary grant projects with
University of California-Davis, Cornell, Purdue, Texas A&M, Michigan State, Oregon State, University of Texas-Austin, Cold Spring Harbor Laboratory and others.

In an effort to expand its international footprint, CALS is working to build its relationship with the U.S. Agency for International Development. Led by Rick Brandenburg and Jean Ristaino, large teams of interdisciplinary CALS faculty joined two external teams invited to compete for multimillion-dollar USAID contracts in the area of food security and safety.

A. Changes in the service environment

The college expects significant positive change in coming years. The 80 faculty positions we will hire over three years in partnership with the Provost's office will enhance our student offerings and our research outputs in meaningful ways. The college is also growing out two important initiatives, the North Carolina Plant Science Initiative and the North Carolina Food Manufacturing and Processing Initiative, that will continue to shape the service environment. These initiatives have brought, and will continue to bring, strong legislative support and fundraising opportunities. The introduction of new talent in combination with BIG IDEA implementation will play a significant role in moving the college up in national rankings to our goal of being a top 5 institution.

B. Initiatives

In addition to the Plant Sciences, Food Manufacturing and Processing, and Student Access initiatives discussed previously in this report, CALS also made headway with several other initiatives.

Through the Animal Food Products Initiative, CALS and the College of Veterinary Medicine will fund three competitive Strategic Enrichment Research Grants. These grants involve nine CVM faculty members and four from CALS on these topics:

- Developing a system for reducing the porcine reproductive syndrome virus in reproductive sows.
- Developing antibiotic use guidelines to mitigate antibiotic resistance in microbes and ensure food safety.
- Developing a project to help Ethiopian poultry farmers enhance livestock production.

CALS and CVM are also working side-by-side to ensure the best training in equine science for both undergraduate Animal Science and Doctor of Veterinary Medicine students. The Reedy Creek Equine Farm is a
new $5 million facility to serve students, clinicians and horse owners. This project is part of a multi-faceted capital improvement campaign. Phase 1, estimated at $2.1 million, is scheduled for completion in 2018.

Another CALS initiative focuses on developing leadership skills for youth, students, faculty and staff, and external stakeholders. Related programs equip leaders to generate big ideas and master the skills necessary to turn those ideas into reality. This year, CALS added the new Executive Farm Management Program to the continuum of leadership training it offers. The year-long program — a partnership of CALS, East Carolina University’s College of Business and the Center for Innovation Management Studies in NC State’s Poole College of Management — is designed to help farmers build the specialized agribusiness management skills they need to successfully run complex, large-scale commercial farms.

C. Diversity

In 2016-17, CALS’ Office of Diversity and Inclusion focused on creating a welcoming college climate; developing and communicating a shared understanding of how diversity and inclusion are essential drivers of innovation and excellence in academia; and recruiting and training a diverse faculty, staff and student body. The office held or participated in more than 30 events on a range of topics related to diversity. These activities included providing cultural competency training for administrators, faculty and staff; developing training modules to educate the CALS community on the challenges of marginalized populations and how to sensitively discuss these challenges; and holding an identity dialogue series on topics such as “The Many Faces of Islam” and “Native Americans and Their Use of the Environment.” The office also audited publications, collected information from CALS committees, associations and groups on climate status and possible trends, and launched a GLBT peer network.

D. Instructional program advances

With the goal of developing a long-term plan for graduate programs, CALS has surveyed its graduate programs and the graduate programs at comparable universities across the nation. In CALS, 42% of all programs reported a decrease in applications this year, while only 16% had an increase, indicating the need to work with programs to increase applications numbers. Graduate student numbers are not being limited by funding alone: Over the last three years, grant funding in the college has more than doubled, yet graduate student numbers have essentially stayed flat, with some faculty members hiring postdocs or technicians over graduate students.
Given the increase in the number of faculty hired in the last two years, we anticipate that these new faculty members will train significant numbers of graduate students. Faculty retirements will offset the numbers somewhat, but overall, we expect there to be a net gain in student numbers.

Growth will need to be strategic. A number of programs already handle as many students as they can or should, considering job or additional education opportunities. In addition, CALS appears to already have a large number of graduate students compared to other universities. We will need to focus on specific programs that have potential for increasing student numbers and consider the creation of new programs.

We also need to provide additional, strategic incentives. Because we have limited funds, we need to determine the best way to use the incentives — such as funding students for the first year only — to maximize the number of students supported and maximize enrollment.

CALS also needs to work on recruiting, especially for those departments with potential to increase student numbers. With this in mind, the college hired a recruiter using funds provided by a generous donor. While the recruiter will mainly focus on undergraduate programs, she will also support graduate programs.

E. Research

NCARS had a productive year, with faculty members making 50 intellectual property disclosures; receiving 38 patents; preparing nearly 800 peer-reviewed research publications; and receiving grant awards of $120.7 million between May 1, 2016, and April 30, 2017. During that time period, the competitive grants awarded per tenure-track research FTE amounted to $718,570.

Major grant projects funded between April 1, 2016, and March 31, 2017, included:

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<th>Principal Investigator</th>
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<td>Annie Hardison-Moody</td>
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Also, an ongoing CALS interdisciplinary effort to defeat a disease of a key African food crop got a boost last fall when the project received a $2.15 million grant from the Bill & Melinda Gates Foundation. Researchers at NC State are working with their colleagues at the Mikocheni Agricultural Research Institute in Tanzania to study DNA molecules that enhance disease symptoms and break resistance to geminiviruses that can cause major crop losses in cassava, one of Africa’s most important food crops.

Here are just some of CALS’ major research accomplishments for 2016-17:

- NC State scientists developed novel landscape types of redbuds through the recombination of weeping growth habit, variegated leaf, purple leaf, golden leaf and compact growth habits. In 2016, sales of the resulting rebud cultivars totaled about 40,000 units. Assuming typical wholesale and retail market value, these cultivars generated over $2 million for the green industry in 2016.

- Studies show that the dietary inclusion of ethanol co-products (distillers dried grains and corn distillers soluble oil) in chicken and turkey feeds, along with appropriate blends of feed additive enzymes, can reduce feed costs by $20 per ton without compromising growth performance, efficiency or welfare of commercial poultry. Assuming 5 million tons of poultry feed produced annually in North Carolina, this strategy impacts the feed and poultry industry by over $100 million. All the state’s major poultry companies use a significant amount of ethanol co-products, locally produced grains and supplemental enzymes to reduce feed costs.

- Remotely sensed metrics can help farmers more precisely deliver and time nitrogen inputs to reduce contamination of groundwater and surface waters. NC State researchers obtained field and airborne hyperspectral data together with airborne LIDAR (light detection and ranging) measurements over several seasons for experimental corn plots in three coastal plain locations. The information gained will be the basis for analytical products that help farmers optimize profit, protect water quality and adhere to environmental regulations.

- NC State researchers, supported by the state’s Pork Council and National Pork Board, have developed neonatal management strategies for replacement gilts to improve sow longevity. In the past, sow replacement rates have been as high as 60% annually. Sow retention rates have doubled in the past for years for farms that have adopted these management approaches, reducing the culling rate to 30%. This translates into each sow producing about 25 more pigs over her lifetime. Given current market prices, this translates into a $5,000 increase in gross income generated per sow. These results have encouraged the National Pork Board to commit an additional $1.2 million for 3 years to further study factors affecting sow longevity.
• Shure Foods is a North Carolina startup company seeking to revamp the crab processing industry by mechanizing the meat extraction process and developing markets for raw crabmeat. Unfortunately, the technology they used doesn’t yield a consistent product. NC State researchers came up with an improved process that will enable the production of "all-crab" versions of the popular fish (surimi)-based crab analogs. As a result of this collaboration, a major surimi manufacturer is now developing all-crab products using USA-sourced, mechanically-extracted raw crab. Products will be test marketed in 2017.

• Intensive research at NC State's Plants for Human Health Institute has proven that blueberries and other berries contain bioactive compounds that combat chronic human disease. Researchers have also studied how to identify and increase the production of bioactive constituents in blueberries by identifying the genes responsible for their formation, and they are working on an innovative technology that produces food products rich in bioactive components. Additionally, researchers are studying the bioactive constituents in nuts to discover how their phytochemicals combat chronic diseases like cancer, inflammation and diabetes.

F. Extension

NC State Extension delivers research-based programs statewide, leveraging our leadership in experiential education to create economic, societal and intellectual prosperity for all North Carolinians. In 2016, Extension’s people and programs had an economic impact of approximately $264.4 million, or nearly $7 returned on every $1 invested by the state. NC State Extension’s 228 county agriculture agents had 763,441 face-to-face contacts, while 672,401 producers adopted Extension’s best management practices and 58,416 consumers learned more about the value of local agriculture in 2016. Extension’s food/nutrition agents made 327,966 face-to-face contacts, teaching people better nutrition and safer food-handling practices. And 4-H Youth Development programs touched more than 247,000 young people, helping them develop life skills and gain deeper knowledge on a range of subjects, including science, technology, engineering and math.

Extension also played an important role in the wake of Hurricane Matthew and of devastating drought and fires in Western North Carolina. Within days of the hurricane, Extension developed a recovery video featuring CALS Dean Richard Linton and NC State Extension Director Richard Bonanno, while launching a “weekly digest” email with essential recovery resources, along with updated fact sheets, new videos and regular updates to the Extension Disaster Portal. These online resources have generated more than 13,400 page views, along with over 1,000 video views on YouTube.
Another notable Extension effort focused on increasing corn production to benefit crop and livestock producers. The southeastern United States produces more hogs and poultry each year than it can feed from local sources, and the costs of importing feed grains into this region are substantial. The potential to sell corn locally, plus a favorable weather forecast and corn yield trends, led NC State Extension specialists and agents to launch an initiative called “Year of the Corn.” Over 48 meetings and field tours, plus popular press articles, reached growers, consultants, industry agronomists, state leaders and others key agricultural decision makers. A large increase in the number of planted acres — 280,000 — along with record yields, resulted in a record corn crop of 144 million bushels. This crop helped the livestock industry meet its requirement for local feed grains, and corn turned out to be the most profitable crop for growers in 2016. If the value of the corn raised on the extra 280,000 acres is calculated based on the average yield of 144 bushels per acre and a conservative average yearly price of $4.25 per bushel, the Year of the Corn initiative had an impact of over $171 million.

G. Faculty: honors, awards and recognition

**Agricultural and Human Sciences:** Kimberly Allen, DELTA Faculty Fellow, NC State; Luci Bearon, Recognition Award, Brookdale Foundation Group; Jackie Bruce, Distinguished Teaching Award, Association of Leadership Educators; Harriett Edwards, Excellence in Volunteer Teamwork Award, NC Association of Extension 4-H Agents; Koralalage Jayaratne, Outstanding Leadership and Service to the Extension Evaluation Profession Award, Topical Interest Group of the American Evaluation Association and CALS Outstanding Instructor; Gary Moore, University of North Carolina Board of Governors Award for Excellence in Teaching Nomination; Travis Park, Teaching Award of Merit, North American Colleges and Teachers of Agriculture (NACTA); Ben Silliman, Excellence in Evaluation Award, Topical Interest Group of the Evaluation Association.

**Agricultural and Resource Economics:** Jonathan Phillips, Teaching Award of Merit.

**Animal Science:** Daniel Poole, Academy of Outstanding Teachers and Outstanding Teacher Award, NC State, and NACTA Educator Award; Shannon Pratt Phillips, Outstanding Educator Award, Equine Science Society, and Alumni Distinguished Undergraduate Professor, NC State Alumni Association; Paul Siciliano, NACTA Educator Award; Shweta Trivedi, Outstanding Faculty, NC State Office of Institutional Equity and Diversity; Steven Washburn, DeLaval Dairy Extension Award, American Dairy Science Association; Distinguished Grasslander, American Forages and Grasslands Council; Distinguished Alumnus, West Virginia University Davis College of Agriculture, Natural Resources and Design; and Honorary State FFA Degree, North Carolina FFA.
**Biological and Agricultural Engineering:** Mike Boyette, Industry Appreciation Award, North Carolina Sweet Potato Commission; National Research Impact Award, National Sweetpotato Collaborators Group; Garry Grabow, Dr. Ronald Sneed Friend of the Irrigation Industry Award, Carolinas Irrigation Association; Gary Roberson, Outstanding Teacher Award, NC State.

**Center for Integrated Pest Management:** Kevin Bigsby, Danesha Carley, Frank Louws, Roger Magarey, Godshen Pallipparambil, Karl Suiter, Jim VanKirk, and Yulu Xia, American Phytopathology (APS) Excellence in Regulatory Affairs and Crop Security.

**Crop and Soil Sciences:** David Crouse, Alumni Distinguished Undergraduate Professor, NC State Alumni Association; Jaap Kretschmar, APS Excellence in Regulatory Affairs and Crop Security; Tom Stalker, Dow Agrosciences Award for Excellence in Research, American Peanut Research and Education Society; Travis Tennant, NACTA Teaching Scholar Award.

**Entomology and Plant Pathology:** Eric Davis, Fellow, APS; David Marshall, USDA Abraham Lincoln Honor Award in global food security; Lina Quesada, William Boright Hewitt and Maybelle Ellen Ball Hewitt Award, APS; Dominic Reisig, Outstanding Extension Program Award, North Carolina Association of Cooperative Extension Specialists; Michael Reiskind, CALS Teaching Award of Merit and Singapore Infectious Disease Initiative Short-Term Visitorship; Coby Schal, CALS Outstanding Faculty Adviser Award and Nan-Yao Su Award for Innovation and Creativity in Entomology, Entomological Society of America; David Tarpy, Roger A. Morse Award for Extension and Teaching in Apiculture, Eastern Apiculture Society.

**Food, Bioprocessing and Nutrition Sciences:** Rodolphe Barrangou, National Academy of Sciences Award in Molecular Biology; Natalie Cooke, CALS Outstanding Faculty Advisor Award and New Adviser Award, NC State Division of Undergraduate Academic Programs; Lee-Ann Jaykus, Alexander Quarles Holladay Medal for Excellence, NC State, and Food Safety Award, North Carolina Extension Association of Family and Consumer Sciences; Sophia Kathariou, Fellow, American Academy of Microbiology; Clinton Stevenson, Innovative Teaching Award, Association of Public Land-Grant Universities Academic Programs Section, and NACTA Educator Award.
**Horticultural Science:** Wayne Buhler, Outstanding Extension Service Award, North Carolina Association of Cooperative Extension Specialists; Danesha Carley, Excellence in Regulatory Affairs and Crop Security Award; Chris Gunter, Thank A Teacher Award, NC State University Faculty Development; Lee Ivy, Gertrude Cox Award for Innovative Excellence in Teaching and Learning with Technology, DELTA and Faculty Center for Teaching and Development; Katie Jennings, Walter S. Dennis Award for Environmental Stewardship, Crop Protection Association of North Carolina; Elisabeth Meyer, Young Propagator Exchange Program, Southern Region, International Plant Propagator Society; Dilip Panthee, Distinguished Alumni Speaker Award, University of Tennessee Department of Plant Sciences; Thomas Ranney, Outstanding Researcher and Luther Burbank Award, American Society for Horticultural Science; Julieta Sherk, William Fulbright Foreign Global Scholar Grant in Science and Technology to Mexico, Bureau of Educational and Cultural Affairs, U.S. Department of State; Todd Wehner, Lifetime Achievement Award, EUCARPIA Cucurbit Conference XI, European Society of Breeding Research; Brian Whipker, Alex Laurie Award, Society of American Florists; G. Craig Yencho, Outstanding Global Engagement Award, NC State International Affairs.

**Molecular and Structural Biochemistry:** Cynthia Hemenway, CALS Outstanding Faculty Adviser Award.

**North Carolina Cooperative Extension:** Mary Arnaudin, Dr. Michael A. Davis Family 4-H Award, North Carolina Association of Extension 4-H Agents; Norman Harrell, Distinguished Service Award, National Association of County Agricultural Agents; Olivia Jones, Communications Award: Educational Publications, Communications Award: Educational Technology, North Carolina Extension Association of Family and Consumer Sciences.

**Plant and Microbial Biology:** Jose Alonso, Thomson Reuters Highly Cited Researcher; Chad Jordan, CALS Thomas Jefferson Scholars Founder’s Award; Xu Li, Arthur C. Neish Young Investigator Award, Phytochemical Society of America.

**Prestige Poultry Science:** Peter Ferket, National Turkey Federation Research Award; Lynn Worley-Davis, NACTA Teaching Award of Merit.
H. Graduate student honors, awards and recognitions


Animal Science: Morgan Bowman, 1st place, equine nutrition blog writing competition, American Academy of Veterinary Nutrition; Jeremy Howard, U.S. graduate student travel bursary award, International Society for Animal Genetics Conference; Rebecca Poole, Award of Excellence in Teaching, NC State Department of Animal Science; Kathleen Walter, McDaniel Graduate Student Travel Award, NC State Department of Animal Science; finalist, American Society of Nutrition emerging leaders in nutrition science poster competition; Jordan Wood, NC State Graduate Student Association Recognition for Excellence in Classroom Teaching; Department of Animal Science Award of Excellence in Teaching among MS students.

Biological and Agricultural Engineering: Bin Cheng, 3rd place, Association of Overseas Chinese Agricultural and Biological Engineers Student Paper Competition; Alison Deviney, 2nd place, Ron Sheffield Memorial Student Poster Competition, 2017 Waste to Worth Conference; Rebecca Purvis, Research Fellow, National Science Foundation.

Crop and Soil Sciences: Rachel Atwell, 1st place, Beltwide Graduate Student Oral Competition; CEFS Graduate Student Fellow; 2nd place, ASA Organic Graduate Student Oral Competition; 3rd place, WSSA/SWSS Graduate Student Poster Competition; Jeffrey Colin Dunne, Charles W. Stuber Travel Award, NC State University; Monsanto Inc. Plant Breeding Graduate Fellowship; McCamy Pruitt, 3rd place for oral session and 3rd place for poster session, Genetics and Molecular Techniques Graduate Student Competition, Crop Science Society of America; 3rd place for Stress Physiology, Breeding and Genetics of Turfgrass graduate student oral competition and poster competitions, American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America International Annual Meetings.
**Horticultural Science:** Nick Basinger, 1st place, PhD poster contest, Weed Science Society of North Carolina; 2nd place (team), Northeastern Weed Science Society Weed Contest. **Shawn Beam,** 3rd place, PhD paper contest, Weed Science Society of America. **Matt Bertucci,** 1st place, PhD paper contest, Weed Science Society of America; 2nd place, Warren S. Barham PhD graduate student paper, Southern Region of the American Society for Horticultural Science; 2nd place, PhD poster contest, Weed Science Society of North Carolina; 2nd place, PhD presentation, Southern Weed Science Society; Travel Award, Weed Science Society of America; 2nd place (team), Northeastern Weed Science Society Weed Contest; 3rd place (team), graduate student poster contest, Crop Protection Association of North Carolina. **Lisa Johnson,** NC State Graduate Student Association Award for Conferences. **Laura Kaderabek,** 1st place, student research competition, International Plant Propagators Society. **Stephen C. Smith,** 2nd place MS poster contest, Weed Science Society of North Carolina; 1st place MS graduate student paper award, National Sweetpotato Collaborators; 3rd place (team), graduate student poster contest, Crop Protection Association of North Carolina.

**Prestige Poultry Science:** Hernan A. Cordova, travel grant award, World Poultry Congress (China); Student Presentation Award — Management and Production, Poultry Science Association Latin America; DSM Latin America Innovation & Applied Science Award of Excellence travel grant; **Al Baraa Sarsour,** travel grant, World Poultry Congress; **Dinabandhu Joardar,** Matthew Livingston, Grayson Walker and Jeffrey Pope, student presentation award, Southern Poultry Science Society.

I. **Fundraising**

This past year, 2016-17, was an exceptional year for College Advancement, with new commitments totaling a record $76 million as of May 31. This represents a 147% increase over last year. Of special note, Golden LEAF funded a grant of $45 million for the North Carolina Plant Sciences Initiative. Other accomplishments include $8.9 million in planned gifts, funding for three distinguished professorships, and an increase of $3.3 million in an estate gift.

Meanwhile, with commitments of $271 million as of May 31, CALS is well on its way to meeting its “Think and Do the Extraordinary” campaign goal of $400 million. The college celebrated the launch of the university-wide campaign with a kickoff luncheon in April.
Opportunities for next year include naming of the college at $50 million and the naming of the departments of Animal Science and Crop and Soil Sciences at $10 million each. In addition, several distinguished professorships are being negotiated with donors in Horticultural Science and Crop and Soil Sciences.

During 2016-17, College Advancement coordinated or assisted with the planning of 84 events with over 6,500 attendees in Raleigh and surrounding areas. The events included board meetings, alumni reunions and events, retirement celebrations, donor and prospect dinners and other various fundraising events. The events varied in size, from small lunch meetings to over 1,200 attendees at the 25th Annual CALS tailgate. The events team also planned Gala in the Garden, the JC Raulston Arboretum’s largest annual fundraising event. This year’s event, held May 7, saw a 20% increase in attendance and an almost 30% increase in silent auction proceeds.

J. Administration: Achievements and staff changes

2016-17 saw significant staff changes in administration: After serving in an interim position following the departure of Sam Pardue in January 2016, John Dole was appointed associate dean and director of academic programs.

Rhonda Sutton was hired to succeed Marshall Stewart as director of college leadership programs; Stewart left NC State to take the position of vice chancellor of extension and engagement at the University of Missouri. After Assistant Dean Keith Oakley’s departure, Sonia Murphy and Kathy Kennel took on interim leadership roles for CALS Advancement. Joyce Munro was appointed assistant dean in charge of business operations. Robert Watling left that position to serve as vice provost at the University of North Texas.

There were also several department head changes. Chris Daubert, head of Food, Bioprocessing and Nutrition Sciences, left the college to take the position of vice chancellor and dean of the College of Agriculture at the University of Missouri. K.P. Sandeep was appointed interim head. Melanie Simpson, from the University of Nebraska-Lincoln, was named head of Molecular and Structural Biochemistry. John Beghin returned to CALS from Iowa State University to serve as head of Agricultural and Resource Economics. Garey Fox, of Oklahoma State University, became head of Biological and Agricultural Engineering. Patricia Curtis returned from Auburn University to become head of Prestage Poultry Science. Derek Aday was appointed interim head of Applied Ecology, succeeding Harry Daniels, who returned to the faculty.
K. Recommendations and concerns for the future

The recruitment of human talent (people) and support for new faculty (facilities, equipment and support staff) will continue to be drivers for our future. The decrease in state support for research, teaching and Extension continues to lessen our ability to grow. As we look to the future, we must be much more resourceful and create resources for tomorrow that are not available today; enhanced competitive grant support and fund-raising will be critical.

To pay for large purchases critical to the research mission, including equipment, supplies and startup funding, NCARS needs the ability to carry over a portion of state funds across fiscal years. Budget management could also be improved with flexibility to spend against the promise of federal funding.

With current starting salaries, we are usually able to attract new faculty hires, but the lack of a reliable salary-increase structure results in salary compression and potential loss of our most productive mid- and senior career faculty to other institutions or companies.

Also, the transfer of technician costs to commodity group funding continues to cause concern among those stakeholders. At the same time, a reduction in the number of technicians makes maintaining our research enterprise harder.

Meanwhile years of budget reductions and reversions have left NCARS with an increasing number of gaps in research areas in which it has implicit and explicit agreements with the state and stakeholders to cover. This includes research areas associated with significant economic potential to the state.

Poor quality space continues to be a problem in recruiting and retaining faculty. The cost of renovations has increased and adds significantly to start ups for new faculty.