



College of Agriculture and Life Sciences STRATEGIC PLAN

2012-2018

 VirginiaTech
Invent the Future

College of Agriculture and Life Sciences
STRATEGIC PLAN

2012-2018





CONTENTS

- Letter From Dean Alan Grant 4
- Introduction 6
- Mission, Vision, Values 8
- Priority Areas 9
- Emphasis Areas 11
- Goals 12-17
 - Goal 1: Provide a comprehensive agricultural and life sciences undergraduate and graduate educational experience 12
 - Goal 2: Strengthen discovery capabilities to successfully address local, state, national, and global needs 14
 - Goal 3: Develop and disseminate science-based knowledge and innovative services through engagement with stakeholders and partners 15
 - Goal 4: Create a stable and sustainable resource portfolio for the college and seek continuous improvement in organizational effectiveness 16
- Appendix I:
Linkages with University Strategic Plan 18
- Appendix II: Planning Groups 22

DEAR COLLEAGUES,

I am pleased to share the College of Agriculture and Life Sciences' 2012-2018 Strategic Plan (www.cals.vt.edu/about/strategic-plan/index.html).

This plan was developed over the course of many months with input and feedback from faculty, staff, students, administrators, and our external stakeholders. I want to acknowledge the committees

and working groups (see Appendix II) who helped create and shape this visionary plan. Many thanks to members of the steering committee chaired by Dr. Jody Jellison, the mission development group, and the three working groups of faculty and staff chaired by Drs. Joyce Latimer, Jay Williams, and George Davis. The college administrative leadership team (department heads, directors of the agricultural research and extension centers, unit leaders, and associate deans) and our external CALS Deans' Advisory Council also had significant involvement.

In addition to new mission and vision statements, the plan includes a list of values, emphasis areas, and four major goals with a number of strategies and high-priority action items. We also included a section in Appendix I that illustrates how our college plan is aligned and linked with the vision, goals, and objectives of the university's long-range strategic roadmap, A Plan for a New Horizon (www.president.vt.edu/strategic-plan/strategic-plan.html). Some of our targets and metrics will be established during the implementation of the plan, while other measures will be tracked over time.

We value and appreciate everyone who contributed to this important process, and we look forward to working with you as we chart the new direction of the college over the next six years.

Sincerely,
Alan Grant
Dean





INTRODUCTION

The College of Agriculture and Life Sciences provides undergraduate and graduate students with an outstanding education. Practicing science in a global environment often involves the interface between science, economics, and culture; it requires that students be given opportunities to experience teamwork that also encompasses academics, research, and extension because research builds the core base of academic knowledge that is translated through formal educational and outreach programs.

Our land-grant mission demands that the colleges' research programs be relevant and address the local, national, and global challenges facing society. The college must be prepared to anticipate and respond to emerging issues important to our diverse stakeholders. Many of these issues require combining contributions from multiple disciplines to achieve understanding and develop solutions. A challenge for the college is to position itself to undertake research programs that address multidimensional and multidisciplinary issues.

Virginia Tech is home to one of the nation's premier comprehensive agricultural and life sciences programs. We will grow and expand our distinctive and globally recognized research profile while meeting the needs of our local communities. The college's research expenditure has increased by more than 60 percent during the past six years. We will strive to increase extramural awards in support of research programs and to be a major contributor to the university's strategic goal of emphasizing the translational approach to research and scholarship in the fields that contribute to agricultural and life sciences — food security and agricultural productivity, water management, global sustainability, energy, health, and environmental quality.

Virginia Cooperative Extension is administered through CALS but encompasses programs delivered and supported by the College of Natural Resources and Environment and the Virginia-Maryland Regional College of Veterinary Medicine. The strategies and actions relevant to VCE in this plan pertain to

the programs delivered primarily from CALS and are predicated on the VCE Strategic Plan. Furthermore, VCE and CALS will take a holistic approach in addressing the strategies under this goal in partnership with the Virginia Agricultural Experiment Station and other research aspects of the college, as well as collaborative relationships with the other Virginia Tech colleges, public and private universities, state agencies, nongovernmental organizations, and private sector entities. Increased numbers of partnerships and our ability to leverage our volunteer programs translate to greater programmatic outreach and impact. VCE will focus on programs that are high-need, supported by the relevant research base, and can be delivered effectively across the commonwealth.

An effective land-grant college requires a sustainable resource base, a commitment to its core mission, and a culture of continuous improvement if it is to meet changing needs and capitalize on emerging opportunities. It also requires an environment that is supportive of a diverse and inclusive community and whose members embrace Virginia Tech's Principles of Community and the college's core values. Ongoing and open communication within the college, as well as with the external stakeholders of the organization, is essential. The college must capitalize on the scholarly creativity and productivity of its diverse faculty and staff members and students; it must use its resources wisely in order to carry out the land-grant missions; and it must routinely monitor its progress in achieving its stated goals.

Although the college relies on significant federal and state funding, annual levels of federal Hatch and Smith-Lever formula funding and state funding are no longer sufficient to maintain today's research and extension programs, let alone meet future needs. Similarly, state support of the instructional mission has not kept pace with levels needed to provide students with a high-quality educational experience. For example, total state support per Virginia student for 2012-2013 is projected to be 33 percent below the funding levels of a decade ago. These trends are requiring us to reallocate funds and develop new approaches for funding programs and operations. Our faculty and staff members have been very successful in growing extramural grant funding, but we must continue to enhance and leverage this creativity and competitiveness to pursue support well beyond traditional approaches and sources.

MISSION

The college creates, integrates, and shares knowledge to enhance:

- Life sciences, food, and agricultural systems
- The economic prosperity and life quality of the greater community
- The stewardship and health of land, water, and air for future generations
- Student learning through diverse, hands-on, experiential opportunities

VISION

We address current and emerging issues in agricultural and life sciences by building on the land-grant commitment of developing leaders and creating and sharing knowledge through diverse, hands-on applications.

VALUES

The College of Agriculture and Life Sciences embraces the following core values:

- Freedom of inquiry
- Mutual respect
- Lifelong learning
- A commitment to diverse and inclusive communities
- *Ut Prosim* (That I May Serve)
- Personal and institutional integrity
- A culture of continuous improvement
- Integrated scholarship across the land-grant missions
- International engagement
- Interdisciplinary collaboration





PRIORITY AREAS

The College of Agriculture and Life Sciences is an integral component of the Virginia Tech research, teaching, and outreach missions. We are committed to developing and implementing programs that address society's needs and expectations.

Our work, at the forefront of discoveries, strongly impacts the residents of Virginia and beyond, the world's scientific community, and international food security. More than 1,200 faculty and staff members — working at the main campus as well as at the agricultural research and extension centers and the local Virginia Cooperative Extension units located across the commonwealth — contribute to this diverse and impressive portfolio.

CONTINUED >>

» PRIORITY AREAS

Our faculty members conduct exciting work in the following areas:

AGRICULTURAL PROFITABILITY AND ENVIRONMENTAL SUSTAINABILITY

- Developing agricultural systems that maintain high productivity in an environmentally sustainable manner
- Studying the impacts of global change on the conservation and management of natural resources

FOOD, NUTRITION, AND HEALTH

- Investigating how knowledge and new technologies can be tied to human health and nutrition
- Assisting in the prevention of chronic diseases such as obesity, heart disease, and diabetes

BIODESIGN AND BIOPROCESSING

- Determining how Virginia's producers can add value to endeavors such as biobased products, bioenergy, crop diversification, and other avenues

THE GREEN INDUSTRY

- Developing high-value horticultural products, businesses, and systems
- Providing programs to assist the commonwealth in adjusting to the economic and environmental impacts of urban sprawl
- Enhancing rural ecosystems

INFECTIOUS DISEASES

- Developing methods to lessen the effects of infectious and vector-borne diseases on plants, animals, and humans
- Studying major infectious diseases, such as West Nile virus, malaria, and other vector-borne diseases that plague the world
- Developing methods of attenuating the effects of diseases through state-of-the-art technologies

COMMUNITY VIABILITY

- Working with local schools to integrate math, science, technology, and engineering into an agricultural curriculum to better prepare students for college and the workforce
- Developing local leaders to meet the challenges of sustainable agriculture and rural development

EMPHASIS AREAS

The college will continue to address the Priority Areas across teaching, research, and extension missions, but an emphasis will be placed on:

SAFE AND SUSTAINABLE FOOD SYSTEMS

- Expanding knowledge and resources for sustainable food systems
- Foodborne illnesses and food safety
- Security of the food distribution and consumption chain

AGING HEALTHFULLY

- Inflammation and disease
- The neuroscience of aging
- Metabolism and health

CLIMATE-RELATED CHANGES

- Forecasting environmental impacts on food systems and on plant and animal health/disease
- Adaptive decision-making by agricultural producers
- Behavioral adaptation to environmental change

BIOPROCESSING/ BIOENERGY AND BIOPRODUCTS

- Alternative energy sources
- Synthetic biology in the future economy
- Value-added products



GOAL 1

Provide a comprehensive agricultural and life sciences undergraduate and graduate educational experience

STRATEGY 1.1: Cultivate a student-engaged learning environment and provide excellence and expanded opportunities in experiential and service learning

Priority Actions:

- a. Recruit, attract, and showcase faculty who are teaching- and student-centered to enhance the quality of academic advising and mentoring
- b. Promote a more student-engaged approach to teaching
- c. Emphasize, promote, and encourage experiential learning opportunities outside of the classroom as well as opportunities for undergraduate research, independent studies, and internships
- d. Develop living/learning communities that integrate CALS disciplines into the fabric of undergraduate on-campus living
- e. Identify critical “universal attributes,” such as skills, knowledge, communication, teamwork, and problem-solving, that are needed for success in the workplace; emphasize and apply these attributes to both classroom and experiential learning environments



STRATEGY 1.2: Commit to innovative and interdisciplinary programs of study through diverse delivery methods that are relevant to the needs of students

Priority Actions:

- a. Develop interdisciplinary and transdisciplinary programs, curricula, or courses
- b. Extend and enhance delivery of undergraduate and graduate distance education
- c. Foster the integration and utilization of instructional technology in the classroom as part of the active learning process

STRATEGY 1.3: Encourage and support efforts to integrate multicultural and international/global perspectives in curricula that meet students' diverse interests and perspectives

Priority Actions:

- a. Develop specific courses and programs that emphasize international/global issues, concepts, and perspectives
- b. Expand international exchange and educational opportunities

STRATEGY 1.4: Strive for a graduate educational experience focused on academic excellence and professional development

Priority Actions:

- a. Enhance/facilitate professional development and entrepreneurial management opportunities
- b. Enhance quality assessment of students, graduates, faculty members, and programs
- c. Promote graduate student participation in active teaching, mentoring experiences, and extension/outreach activities
- d. Maintain our commitment to graduate programs meeting specific workforce needs in core disciplines

STRATEGY 1.5: Strategically increase undergraduate and graduate enrollment and retention in the college

Priority Actions:

- a. Develop a comprehensive college recruitment plan to strategically increase undergraduate enrollment to 3,000 and graduate enrollment to 850
- b. Evaluate the retention patterns of first- and second-year undergraduate students
- c. Increase internal and external transfers of undergraduates into CALS
- d. Develop and deliver promotional and recruitment tools for prospective undergraduate and graduate students
- e. Create a source of funding to enhance minority enrollment through the expansion of existing scholarship funds (e.g., the George Washington Carver Scholarship Program) and development of new scholarship funding

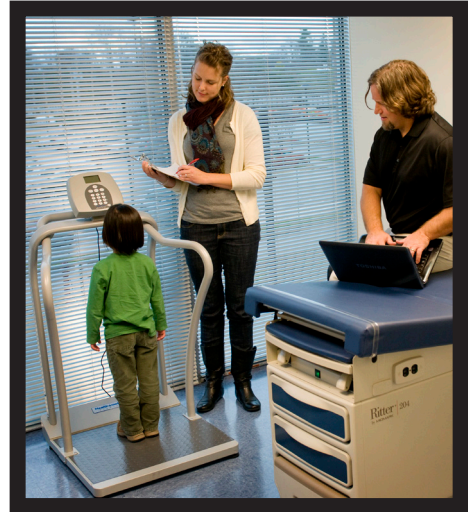
GOAL 2

Strengthen discovery capabilities to successfully address local, state, national, and global needs

STRATEGY 2.1: Enhance the discovery and translation of knowledge to address the most challenging scientific and social issues

Priority Actions:

- a. Build on the college's traditional competencies and commitment to scholarship while investing in emerging areas of excellence
- b. Diversify extramural research funding portfolio (increase annual new awards from \$45 million to \$70 million by 2018)
- c. Increase the number of annual awards larger than \$500,000 (from 12 currently to 20)
- d. Translate research discoveries into technologies, products, and services that enhance economic development



STRATEGY 2.2: Engage internal and external collaborators and stakeholders to identify and enhance discovery activities that expand the impact of college programs

Priority Actions:

- a. Enhance public/private partnership to facilitate translational research
- b. Enhance national and international strategic partnerships with private industry, institutes, and government laboratories
- c. Continue to encourage faculty to form interdisciplinary teams as well as productive partnerships with relevant stakeholders
- d. Integrate research goals with the land-grant obligation to support workforce development, economic opportunity, and community viability
- e. Invest in and sustain an internal seed grant and bridging program to encourage interdisciplinary and multidisciplinary research and to sustain productive programs during unfunded intervals

GOAL 3

Develop and disseminate science-based knowledge and innovative services through engagement with stakeholders and partners

STRATEGY 3.1: Support and implement the five programmatic focus area goals of the Virginia Cooperative Extension Strategic Plan: Committed to Virginia's Land, People and Communities (www.ext.vt.edu/strategicplanning/index.html) and support the outreach efforts of the entire College of Agriculture and Life Sciences

Priority Actions:

- a. Foster programs that fully integrate the functions of research and extension across local units, departments, and agriculture research and extension centers that are addressing the priority areas of the college and the university (www.president.vt.edu/strategic-plan/strategic-plan.html)
- b. Use customer feedback and performance measures to adjust priorities and program delivery while developing and implementing a documentation and reporting system to benchmark and exemplify the contributions of extension and outreach programs
- c. Use campus and field faculty to enhance opportunities for international extension and outreach programs
- d. Increase regional cooperation to address shared challenges and opportunities

STRATEGY 3.2: Throughout the college, enhance delivery of extension and outreach programs through the increased use of volunteers, public and private partnerships, and innovative technology to create opportunities for new audiences in Virginia and beyond

Priority Actions:

- a. Enhance partnerships between VCE specialists at Virginia Tech, Virginia State University, and the ARECs and agent faculty members at other public or private universities; local, state, and federal agencies; nongovernmental organizations; and/or nonprofit partners

FIVE PROGRAMMATIC FOCUS AREAS OF VCE:

- Enhancing the value of Virginia's agriculture
- Sustaining Virginia's natural resources and the environment
- Creating a positive future through 4-H youth development
- Strengthening Virginia families and communities
- Cultivating community resiliency and capacity

CONTINUED »

» GOAL 3

- b. Increase the number of programs approved for continuing education unit credits and the revenue generated from programs delivered to professional or industry audiences
- c. Increase the use of innovative technology and scholarship methods to reach targeted audiences
- d. Increase the number of CALS programs with quantifiable and visible economic and social benefit to local and state stakeholders
- e. Leverage more volunteers and volunteer programs to extend the outreach capacity of the Virginia Tech campus across the commonwealth



GOAL 4

Create a stable and sustainable resource portfolio for the college and seek continuous improvement in organizational effectiveness

STRATEGY 4.1: Position CALS to be less dependent on federal formula funds

Priority Actions:

- a. Develop plans to shift salaries paid by formula funds to state funds
- b. Increase the diversity of external grants and contracts
- c. Explore innovative funding models including private/public partnerships

CONTINUED »

» GOAL 4

- d. Increase multi-institutional and multidisciplinary projects and funding
- e. Increase the revenue from scholarly and professional activities, including intellectual property licenses
- f. Expand college and departmental development efforts

STRATEGY 4.2: Develop a comprehensive plan for modernization of college physical facilities and resources

Priority Actions:

- a. Track sources and amounts of funding used for new construction, renovation, and new equipment
- b. Develop funding and prioritization plans for facility improvements

STRATEGY 4.3: Develop and implement a communication system that encourages openness and transparency

Priority Actions:

- a. Develop and formalize plans that promote effective communication internally and with external stakeholders and volunteers, including a review of the college publication plan
- b. Activate the college governance system
- c. Form advisory councils for all departments, ARECs, and local VCE units

STRATEGY 4.4: Invest in the recruitment and professional development of a diverse community of faculty members, staff members, and students

Priority Actions:

- a. Identify new funding sources for increasing the diversity of administration, faculty, staff, and students (including scholarships for students)
- b. Promote activities of the CALS Diversity Council, University Visiting Scholars Program, and AdvanceVT to faculty and staff
- c. Promote broad involvement of college liaisons in all faculty searches
- d. Increase collaborations with minority-serving institutions and strengthen the George Washington Carver Scholarship Program
- e. Promote broader participation in professional development activities
- f. Submit more nominations for awards and honors and for applications to key faculty scholar programs at the national and international levels

APPENDIX I

Linkages between the College of Agriculture and Life Sciences' Strategic Plan and the university's Plan for a New Horizon

UNIVERSITY PLAN: Build on our strengths as a comprehensive public research university and land-grant institution; our goal is to establish a distinctive and globally recognized profile that emphasizes translational research and scholarship and builds on our existing and emerging strengths.

CALS PLAN: The College of Agriculture and Life Sciences is an integral component of the Virginia Tech research and outreach enterprise. The college is committed to developing and implementing research and extension programs that address society's needs and expectations. CALS is committed to the integration of scholarship across the land-grant missions of teaching, research, and extension. The strengths of the college as one of the nation's premier programs in agriculture and life sciences is realized as "translational" and aligns well with the university's plan to meet state and federal commitments for higher education and research.



UNIVERSITY PLAN: We are poised to grow our undergraduate enrollment when appropriate and will pursue significant and strategic growth in graduate enrollment. Focusing on growth in graduate enrollment in science, technology, engineering, computational sciences, health sciences, and business- and policy-oriented subjects. ... This growth will also facilitate the pursuit of our mission to address significant science, technology, economic, and social issues.

CALS PLAN: CALS will be a major contributor to the growth in both undergraduate and graduate enrollment at the university over the next six years. CALS is one of a select few land-grant institutions able to offer a comprehensive agricultural and life science education in both the traditional disciplines and in

emerging areas of interdisciplinary scholarship. Undergraduate enrollment will increase from 2,600 to 3,000. Graduate student enrollment will increase from 500 to 850 in areas cutting across science (STEM-H), technology (biotechnology, nanotechnology, and bioinformatics), economics (agricultural economics, agribusiness, and financial planning) and the social sciences — all of which are components of CALS’s strategies for future growth.



UNIVERSITY PLAN: The integration of business with programs in science, engineering, and medicine creates the opportunity for radical innovation. In the spirit of our mission, we will contribute to business-, industry-, and policy-relevant research with a focus on multiple dimensions of security, resilience, health, and sustainability. These themes will also underpin much of our outreach activities and service learning.

CALS PLAN: CALS will build on its strengths and strong history of collaboration with industry and business. We will continue to leverage our strengths across our research, teaching, and outreach missions. CALS will provide the research underlying policy development in areas of food and natural resource security; animal, human, and plant health and disease; environmental sustainability; and sustainable food systems, as well as support for rural health and economic and community development. The faculty is positioned to contribute to relevant outreach and service activities.



UNIVERSITY PLAN: Studying complex interactions among genomic, environmental, and behavioral factors will require methods that are grounded in high-performance computing and networks capable of moving, processing, and storing enormous volumes of data.

CALS PLAN: CALS will continue to prioritize programs that focus on the genetic and environmental factors that regulate and affect human, animal, plant, and ecosystem health. CALS is already a major player in the management of genomic, proteomic, and metabolomic data. CALS is currently involved in studying complex interactions in areas ranging from obesity research to crop drought resistance, to simulation modeling of water and pollutant transport within

aquatic and terrestrial environments. The utilization of network analysis to study multivariate systems will become more important in the future.



UNIVERSITY PLAN: Virginia Tech will leverage existing and emerging strengths in the following areas: energy, materials, and technology; water science, policy, and management; transportation and communication infrastructures; natural resources, ecosystems, and environmental quality; informatics and policy; food and food systems; and sustainable international development. ... To ensure the continued success of our existing strengths, we will support growth in bioinformatics, nanotechnology, polymers, energy, transportation, and robotics research and scholarship.

CALS PLAN: There are strong linkages to CALS in all of these areas, especially in energy (e.g., bioenergy and feedstock development); materials and polymers (e.g., biomaterials, value-added bioproducts and biopolymers); technology (e.g., genetic engineering); water science, policy, and management; natural resources, ecosystems, and environmental quality; informatics (bioinformatics); food and food systems; and sustainable international development (e.g., international US AID and FAO agriculture projects).



UNIVERSITY PLAN: The Networked University — students and faculty members will become increasingly international in orientation.

CALS PLAN: CALS has recently appointed an international programs coordinator and is continuing to expand international opportunities for faculty and students in teaching, research, and extension areas. CALS is home to extensive international collaborations with researchers and institutions in Asia, Africa, Latin America, and Europe.



UNIVERSITY PLAN: Pathways to Interdisciplinary Success — Virginia Tech will create and support environments for its educational and research programs that support innovative, high-quality, and high-impact outcomes. We will facilitate the development of new and innovative graduate programs that build on interdisciplinary strengths, both existing (e.g., the Genetics, Bioinformatics, and Computational Biology Program) and emerging (e.g., health sciences).

CALS PLAN: CALS faculty members currently lead or co-lead interdisciplinary graduate programs in translational plant science, the water interface, and translational obesity and in genetics, bioinformatics, and computational biology. CALS will continue to lead interdisciplinary programs and to play a role in developing new and innovative transdisciplinary programs.



UNIVERSITY PLAN: Increase undergraduate involvement in meaningful research experiences and experiential learning opportunities by adopting a “hands-on, minds-on” philosophy that promotes the connection of real-life experience with academic concepts.

CALS PLAN: Agriculture and the life sciences provide students a unique disciplinary framework for research and experiential learning, with opportunities for capstone experiences, internships, and undergraduate research projects. CALS’s vision statement stresses the importance of creating and sharing knowledge through experiential and hands-on applications. CALS will continue to build on this strength; thus, it is a common theme throughout the teaching and learning section of the CALS plan. CALS also plays a leading role in e-learning and distance learning including the online M.S. program in agriculture.



UNIVERSITY PLAN: We will also build on our initiatives in the field of resiliency with an emphasis on the interface between science, technology, and policy.

CALS PLAN: The immediate future will include major challenges and opportunities. Climate variation, exploding and conflicting food and energy needs, and technological advances and threats will necessitate a holistic response. As a STEM-H college, CALS has a continuing commitment to collaborative, transdisciplinary agricultural and life sciences research, teaching, and outreach, including stakeholder involvement, real-world engagement, and integrative problem-solving necessary for resilience and sustainability. CALS will increase its focus on the resiliency of agricultural and other managed ecosystems in the face of climate and land-use changes.

APPENDIX II

Planning Groups

STEERING COMMITTEE

- Jody Jellison (chair)
- Erik Ervin
- Elizabeth Grabau
- Lori Greiner
- Joseph Marcy
- Kim Niewolny
- Steven Rideout
- Kurt Stephenson
- Pete Schultz
- Mary Leigh Wolfe

MISSION STATEMENT GROUP

- Susan Clark
- Martin Daniel
- Ed Jones
- Alan Grant
- Jody Jellison
- Howard Ladewig
- Joseph Marcy
- Saied Mostaghimi
- Susan Sumner
- CALS Student Ambassadors

WORKING GROUPS

Teaching: Jay Williams (chair), Lee Daniels, Theo Dillaha, Zerita Montgomery, Isis Mullarky, Bobbie Potter, David Schmale, Hyrum Smith, Rebecca Splan, Jinsong Zhu

Research: George Davis (chair), Eric Beers, Sue Duncan, Rich Helm, Ames Herbert, Steve Hodges, Rob Rhoads, Boris Vinatzer, Pat Williams, Jamie Zoellner

Extension: Joyce Latimer (chair), Brian Benham, Renee Boyer, Michelle Dickerson, Karen Gehrt, Bob James, Eric Kaufman, Cyndi Marston, Scott Shetrone, Abigail Villalba, Rod Youngman

College of Agriculture and Life Sciences
STRATEGIC PLAN
2012-2018

