

Why Agriculture **Community** **Report**

2022-2023



DALHOUSIE
UNIVERSITY

FACULTY OF
AGRICULTURE



Message from the Dean

We are on the precipice of some amazing things in agriculture.

Dalhousie received an historic \$154 million investment to study the ocean's pivotal role in climate change including many of our researchers across several departments.

We established the McCain Foundation Postdoctoral Fellowships in Sustainable Agriculture intended to attract recently graduated PhD scholars of superior research ability to the Faculty of Agriculture.

Our Truro start program expanded to include the Faculty of Arts and Social Sciences.

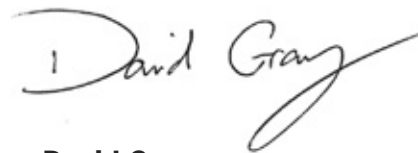
Dr. Paul Manning and Laurel Schut of the College of Sustainability taught a new interdisciplinary field course on the topic

of *Measuring Food Sustainability*. This is the first course specifically designed to bring together students from the Truro and Halifax campuses since merger in 2012.

After a three-year hiatus due to Covid, Community Day returned to campus in July hosting close to 2000 community members and industry partners with an overall theme of careers in Agriculture.

More funding, more research, and more academic talent

The future is looking bright.



David Gray
Dean, Faculty of Agriculture



Local and global sustainability

- COIL (Collaborative Online International Learning) offers inclusive and equitable learning experiences for all and provides students with important global employability skills. Students not only learn within the ‘walls’ of a classroom but gain cultural understanding and a global perspective on education and work without leaving the university. Dal-AC has several online learning opportunities with over 60 Dal-AC students expected to participate.
- The Organic Agriculture Centre of Canada in the Department of Plant, Food, and Environmental Sciences successfully completed its third Organic Science Cluster. This Cluster is the national 5-yr science program for organic agriculture in Canada. Over \$10 million in research was carried out by scientists across Canada.
- Dr. Rick LeBrasseur organized Atlantic Canada’s first Green Infrastructure Conference to increase resilience in the face of climate change.
- Dr. Lord Abbey received the Dalhousie Faculty of Agriculture Achievement in Internationalization Award. Lord has been involved in various research and teaching programs with academic institutions and organizations in Ethiopia, Uganda, Saint Lucia, India and most recently, development of a new grass roots project in Tanzania.
- Dalhousie received an historic \$154 million investment to study the ocean’s pivotal role in climate change. Department of Engineering professors Drs. Sophia He and Gordon Price are part of this Canada First Research Excellence Fund initiative as well as Dr. Lord Abbey.
- The Centre for Sustainable Soil Management hosted the annual meeting of the Canadian Society of Soil Science. The meeting was attended by 257 scientists from across Canada and abroad.



Our Dominican partners from the SAGE-02 project were on campus this past summer. This CIGan project, funded by the Government of Canada, developed skills-based training programs on climate-resilient construction, linking Dominican youth with the skills required by the local labour market

Local and global sustainability

- Dr. Brandon Heung is a member of the research team of the Forest Innovation Transition Trust. With funding of \$1.57 million, the team will examine biodiversity, habitat connectivity, carbon sequestration, evaluation, and opportunities for human recreation in the forests.
- Dr. Chijioke Emenike was awarded a Fellowship from Carnegie African Diaspora Fellowship Program. The program provides funding for African-born academics in the United States and Canada to collaborate with colleagues at accredited higher education institutions in Ghana, Kenya, Nigeria, South Africa, Tanzania, and Uganda on capacity-building education projects allowing him to spend three months in the Open University of Tanzania.
- Dr. Mason MacDonald & Dr. Paul Manning coached Cobequid Educational Students in science facts for the North American Envirothon.
- \$650k+ in donor funded scholarships and bursaries awarded to students.
- One of the largest international development projects ever awarded to a Canadian university came to an end after eight years of transformative work in sub-Saharan Africa. The Agricultural Transformation Through Stronger Vocational Education project helped to evolve Ethiopia's agricultural practices and education beyond its subsistence-based foundation towards a market-focused system.
- James 'Jim' Borden, NSAC Class of 1950, received posthumous induction into the Atlantic Agricultural Hall of Fame for his commitment to crop development in Nova Scotia.
- Dal AC International hosted eight Dominican and four St. Lucian partners, funded through the Skills to Access the Green Economy project. The Dominican partners were interested in student support tools and institutional approaches to engaging underserved communities. The Saint Lucian delegation worked to build technical skills in crop production and agri-business and visited several smallholder farms to learn of local approaches to sustainable agriculture and food security.
- An African Wildlife Ecology field course saw 18 students participate in a three-week learning experience in South Africa. In partnership with Rhodes University

and funded by Colleges and Institutes Canada (CICan), students participated in lectures on anthropology, ecology, animal behaviour, palaeontology, and the climate and history of the region.

- The Uganda Skills Development Project closed after four years. A world Bank funded project partnered with Bukalasa Agricultural College to develop three new diploma programs in Agri-Processing, Crop Production, Animal Livestock and Business Management. Our partner college has successfully graduated a couple of cohorts of new students and Dal AC has mapped pathways from their Diploma Program into Truro campus.



- New Assistant Professor in Clean Agriculture Technology and Energy, Dr. Sonil Nanda.
- Bioenergy and Bioproducts Research Lab Killiam Post-Doctoral Fellow, Dr. Rahil Changotra under supervisor Dr. Sophia He, are examining methods to treat wastewater using biomass-derived material in pursuit of a sustainable waste-to-wastewater platform.

Local and global sustainability

- McCain Foundation Postdoctoral Fellow in Sustainable Agriculture, Dr. Weixi Shu is working as part of a broader Faculty of Agriculture led team to build a library of soils and mid-infrared range spectra across agricultural systems from Atlantic Canada to develop predictive models for soil health and quality.



- Dr. Gordon Price hosted NSERC USRA student Emily Gowan. The project measures greenhouse gas emissions and fluxes produced from source separated organic composted material from the Colchester and Pictou composting facilities, and anaerobically digested materials from Gore, NS over the growing season on a field site in Truro.
- Dr. Tri Nguyen-Quang and the Biofluids and Biosystems Modeling Lab collaborated on an international project with Hue University of Science (Vietnam) and Paris-Saclay University (France) to focus on the water quality research and Toxic Algal Blooms of the Tam Giang Lagoon, the biggest Lagoon in Southeast Asia.
- Engineering researchers hosted eight Mitacs students from France and India, who worked with the Agricultural Mechanized Systems, Biofluids and Biosystems Modeling, Bioenergy and Bioproducts Research and Applied Intelligent Engineering Systems teams on various projects related to precision application for wild blueberry harvester automation, harmful algal bloom, biochar for wastewater treatment and potato production engineering systems.
- Jayden MacKenzie, an NSERC USRA student with Dr. Gurpreet Singh Selopal, contributed to a project on the Development of novel Chromophore for Self-Sustainable Greenhouse System.
- Applied Intelligent Engineering Systems PhD student Mozammel Motalab completed a Mitacs Globallink internship at Hochschule Geisenheim University in Germany focusing on the integration of vision systems in site-specific real-time spraying applications through the utilization of ISOBUS technology.
- Dr. Sarah Stewart-Clark was appointed to the Premier and Minister's Roundtable on Environment and Sustainable Development for a three-year term.
- Dalhousie received an historic \$154 million investment to study the ocean's pivotal role in climate change. Dr. Sarah Stewart Clark is examining how climate change induced sea level rise and storm surges will impact the intertidal zone, including commercially important mollusks and crustaceans.
- A total of nine new faculty members were hired over the past year in the areas of Animal Science, Plant Food and Environmental Sciences and Engineering.

Health and Well-being

- Men's and Women's Loggersports Teams (formerly Woodsmen), both won the CILA National Championship, the first one held since 2020.
- The 2023 CCAA National Badminton Championship were hosted on campus March 8-11
- The second annual Mini University and Soccer Camp was a success offering 20 youth ages of 7-12 the opportunity to learn from Varsity coaches and instructors on campus. This camp is a partnership between Dal AC Athletics and Community Education.
- A six-session mentorship program for Indigenous students was developed. The sessions focus on study skills to Indigenous language revitalization to financial skills to academic writing from an Indigenous perspective to self-care and mindfulness.
- In a collaboration with Schwabe Group and their Canadian sub-division Nature's Way Canada in Dartmouth, NS, Dr. H.P. Vasantha Rupasinghe, will develop scalable 'green' processes to extract and evaluate active constituents from haskap berries grown in Canada.
- Plant, Food, and Environmental Sciences hosted the North American Rock Garden Society Conference
- The Rock Garden received the Frank Cabot Public Garden Award, given annually to a public garden that excels in furthering the purpose of the North American Rock Garden Society and promoting the construction and design of rock gardens, the cultivation, conservation and knowledge of rock garden plants and their geographical distribution in the US and Canada.
- Community Education initiatives reached 3400 people this past year through 20 field trips to campus and 12 in-class visits.
- Community Education collaborated with multiple groups on and off campus to work on specialized projects and events for marginalized groups such as Indigenous and Black African Nova Scotians as well as promoting women in agriculture.



After a three-year hiatus Community Day returned to campus in July hosting close to 2000 community members and industry partners with an overall theme of careers in Agriculture.

Health and Well-being

- Canada's Ag Day event was co-hosted with the Nova Scotia Federation of Agriculture. A panel discussion on the Future of Food was held at the Halifax Public Library and was open to the public with close to 50 people in attendance.
- Grow Where You're Planted returned with 18 students. The agricultural exploration program targets students in grades 10 and 11 who identify as African Nova Scotia or African. This program is in partnership with the Nova Scotia Department of Agriculture and the Nova Scotia Department of Education and Early-Childhood Development.
- AgZone was hosted on campus in partnership with Agriculture in the Classroom with over 400 students in attendance.
- Lorne Alexander Julien is a proud Mi'kmaw artist and member of Millbrook First Nation, Nova Scotia. He recently completed two murals on the Agricultural Campus in Cox Institute – one in the new Indigenous Student Space in East Cox and most recently one in the entrance of West Cox.
- Further reduced barriers for Indigenous students applying to the ISAP with changes to admissions requirements.
- Ten Indigenous students travelled on a New Mexico State Study Tour in February. The focus of this opportunity was Equine Management and Medicinal Plant Sciences.
- Local Indigenous high school students were invited on campus for Awtiket Youth Camp, which was held during National Indigenous People's Month in June. Students took part in campus tours, and exploration of academic programming including culturally relevant agricultural teachings.
- The Canadian Society of Bioengineering first Annual Trackman Golf and Networking at the Truro Golf Club was hosted by the Department of Engineering promoting Bioengineering careers and the importance of a work life balance.
- Dalhousie invested nearly \$5 million over the past five months alone in reinvigorating campus.



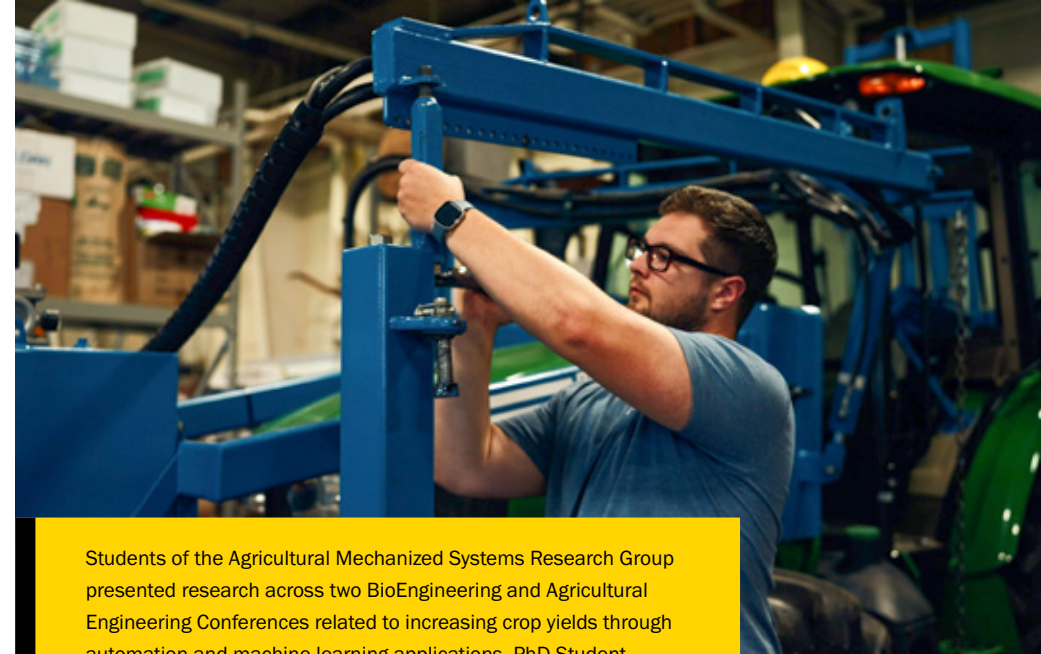
Health and Well-being

- Sustainable Nanoengineering Lab summer research student, Connor LaBonte, worked on the eco-friendly core/shell quantum dots for anticounterfeiting and biomedical application, such as security inks or cancer cell imaging. Connor successfully completed the synthesis of the semiconductor core/shell quantum dots of different shell thicknesses and investigated their optical properties under the direction of Dr. Gurpreet Singh Selopal
- After 46 years as a faculty member on the Dalhousie Agricultural Campus, Dr. Peter Havard officially retired June 30th, 2023 from the Department of Engineering.



Food Security

- Dr. Paul Manning developed and co-taught a new interdisciplinary field course on the topic of Measuring Food Sustainability, a three-credit hour course condensed into 10 days and split between the Halifax and Truro campuses of Dalhousie University. This is the first course specifically designed to bring together students from the Truro and Halifax campuses since merger in 2012.
- As a natural extension of Sustain, the winter semester of 2023 included the pilot program Cultiv8 CHEF. A partnership between Cultiv8 and Chef Reinier Boermans, Cultiv8 CHEF enabled students from a variety of disciplines and cultures to convene, learn about food security in the context of preservation, and develop value-add products as means to deploy iterative and innovative approaches to product development and customer discovery/feedback.
- Dr. Travis Esau, P.Eng was awarded the 2023 Early Career Research Excellence Award and the 2022 Young Engineer of the Year Award from the Canadian Society for Bioengineering for work in Mechanized Systems related to Wild Blueberries.
- Students of the Agricultural Mechanized Systems Research Group presented research across two BioEngineering and Agricultural Engineering Conferences related to increasing crop yields through automation and machine learning applications. PhD Student, Patrick Hennessey presented his work on machine vision applications on agriculture sprayers and MSc student, Connor Mullins presented his research on real time volume estimation of harvested crop.
- Dr. Gurpreet Singh Selopal continues impressive work to establish and build the Sustainable Nanoengineering Lab exploring the potential optimization of nano-fertilizers for potato production.
- The Applied Intelligent Engineering Systems Research Group under Dr. Ahmad Al Mallahi gained international attention in the Guardian for their futuristic farm with McCain Foods working on a crop-spraying rig that uses artificial intelligence to identify bugs and weeds in potato production.
- A paper titled, Automatic Imaging System Mounted on Boom Sprayer for Crop Scouting Using an off-the-shelf RGB Camera” authored by MSc student, Colton



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Campbell and his supervisor Ahmad Al Mallahi with international collaborators received the Food Security 2023 HQP Research Paper Award by the IC-IMPACTS Research Centre of Excellence.

- Dr. David Percival, a Professor of Whole Plant Physiology in the Department of Plant, Food, and Environmental Sciences at Dalhousie University was one of three finalists of a Public Impact Award presented by Research NS.
- The McCain Foundation Postdoctoral Fellowships in Sustainable Agriculture were established and are intended to attract recently graduated PhD scholars of superior research ability to the Faculty of Agriculture. Three were awarded in 2023 and are valued at \$60,000 per year for a term of two years.
- Plans were launched to build a Sustainable Food Systems Facility, a centerpiece of the Smart Farm Innovation Hub which will foster enhanced collaborations with industry and government partners in development and testing of clean and precision technologies in areas of sensing, connectivity, machine learning, automation, data analytics, and others.



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